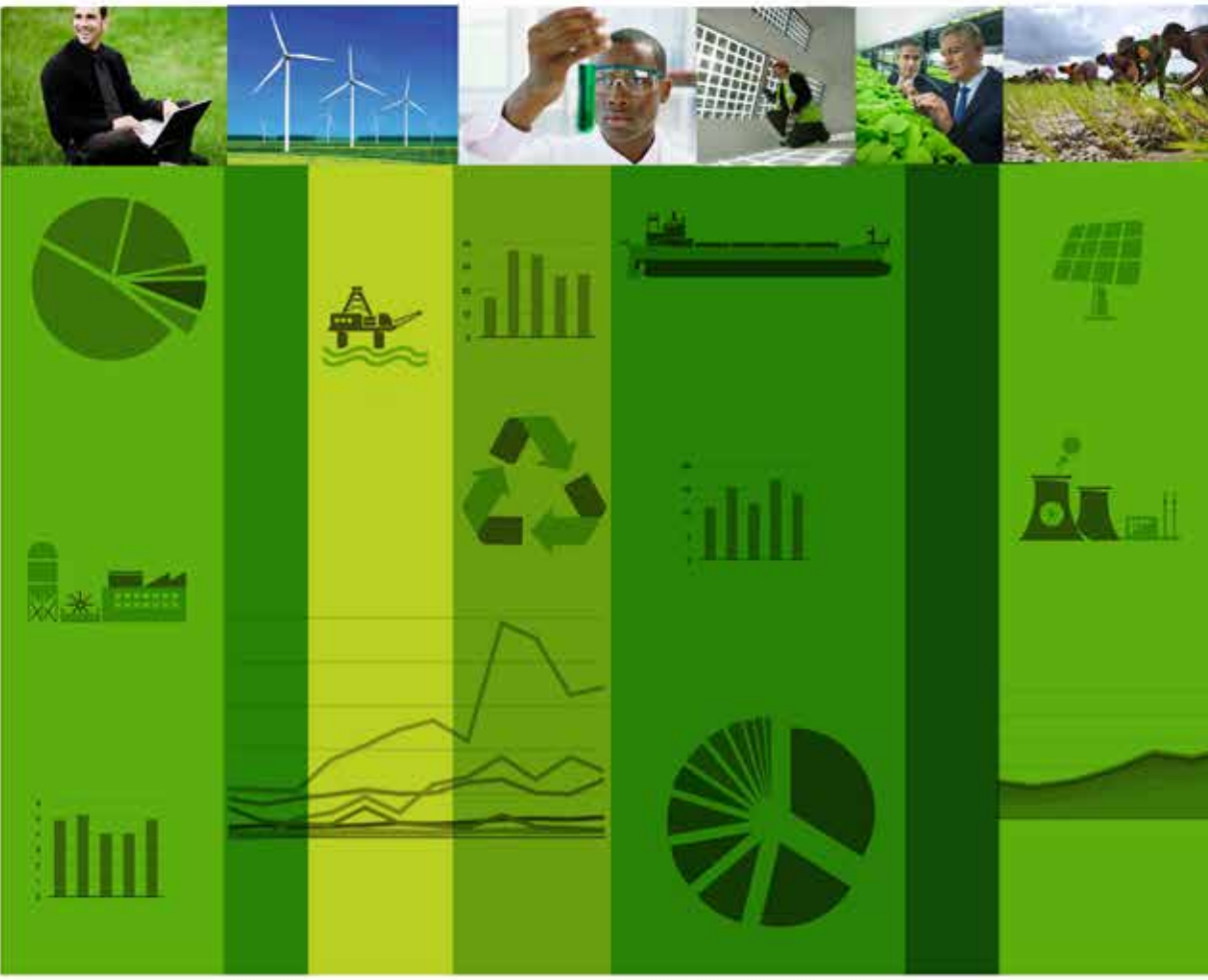
Greening Economies, Enterprises and Jobs

The role of employers' organizations in the promotion of environmentally sustainable economies and enterprises



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The Global Voice of Business

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Greening Economies Enterprises and Jobs

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Foreword

Environmental concerns and the path toward sustainable development pose a major challenge but also represent a major opportunity for business.

In a world affected by the impact of climate change and the unsustainable use of natural resources, doing business-as-usual is no longer an option. The key concern is how to reconcile long-term business growth with sound economic development, a healthy environment and social inclusion.

Sustainability has therefore become a mainstream concern for business, which must take the lead in driving sustainable change. Business is at the forefront of delivering economically and environmentally viable products, processes, technologies, services, and solutions required in the transition toward a greener economy and sustainable development.

The global focus on environmentally sustainable development and the transition to greener economies has major implications for business and employers' organizations. In order to play an effective role in the promotion of environmentally sustainable economies and enterprises and address their members' needs, many national business and employers' organizations, particularly in the developing world, first need a better understanding of these issues in order to address the policy and technical aspects of the transition.

As the voice of business, employers and business organizations need information, tools and good practices to become effective advocates for their members in national policy dialogues and develop strategies for minimizing risks and identifying opportunities for their own organizations and members. This includes providing advice and guidance on identifying new green business opportunities and markets, improving resource efficiency and reducing wastage, thus leading to direct cost-savings and higher productivity.

This Resource Guide has been developed with this aim in mind. It provides an overview of the current sustainable development debate, the main environmental challenges and their implications for business, the greening of enterprises and workplaces, and the role that business and employers' organizations can play in lobbying and service development in the environmental field.

The text and related training package have been validated at two inter-regional workshops at the ILOITC and one in Asia, involving employers and business organizations from a wide range of countries. It represents a major step forward in supporting and encouraging employers' organizations and their members to take concrete actions towards more environmentally sustainable business development.

The development of the Resource Guide is a concrete follow-up to the conclusions of the 2013 International Labour Conference on Sustainable Development, Decent Work and Green Jobs calling for social partners to raise awareness, create understanding and provide guidance among their members about the issues involved in the greening of enterprises and creation of jobs. A subsequent ILO tripartite expert meeting, held in October 2015, adopted a set of practical guidelines for a just transition towards environmentally sustainable economies and societies. The guidelines address eight policy areas including enterprise policies, which reflect the same objectives and advice contained in the Resource Guide.

This publication is being launched at an opportune moment as the ILO has embarked on the "Green Initiative" as part of a reflection on the Future of Work in the lead up towards the ILO's centenary in 2019. The Green Initiative aims at expanding the ILO's knowledge base and strengthening its leadership in guiding constituents through the transition to more sustainable enterprises, economies and societies.

The Resource Guide, which was developed under the ILO-Norway Partnership, is the result of close and effective collaboration between the Green Jobs Programme, the Bureau for Employers Activities and the International Training Centre of the ILO in Turin. It also signals the growing commitment to undertaking joint initiatives by different partners in order to address the complex nature of the transition and the integrated response it requires.

It is our sincere hope that this Resource Guide will be a useful tool to stimulate, motivate and support employers and business organizations and their members to take action and join forces in achieving environmentally sustainable business development across the globe.

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Acknowledgements

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Contents developed throughout the four sections build on training materials developed by the Green Jobs cluster of the International Training Centre of the ILO (particularly Section 1, which is an adaptation of Module 1 of the distance learning course "Green Jobs for Sustainable Development: Concepts and Practices" from the perspective of business) and the Greener Business Asia ILO Project (Section 3, which was greatly inspired by a series of training handouts, technical briefs and case studies for business organisations on "Promoting sustainable enterprises with greener jobs in the Asia Pacific region").

Maria José Alzari, Business Council for Sustainable Development in Argentina (Consejo Empresario para el Desarrollo Sustentable) and Alice Vozza, drafted Section 1 "Introduction to sustainable development: global debate, key concepts and perspectives of business" and Section 2 "Understanding the main environmental challenges and their implications for business". Substantial inputs to Sections 1 and 2, especially for what concerns the chapters on energy were received by Jan Herremans, former Director General of the Federation of Belgian Electricity and Gas Companies.

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Section I

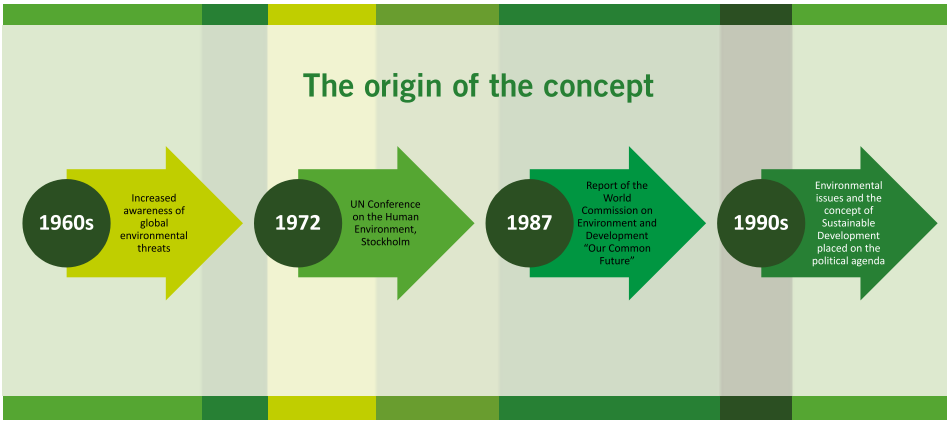
Introduction to sustainable development: global debate, key concepts and perspectives of business

1.1 The evolving position of business in the sustainable development debate

1.1.1 From Stockholm 1972 to Rio de Janeiro 2012: the sustainable development route

Sustainable development is a multifaceted concept which addresses the relationship between economic growth, human well-being and environmental degradation. Often overused, the concept has been under review and discussion for more than four decades because of the difficulty in linking principles (broadly recognised) with practice (unevenly achieved), owing to the complexity of the issues bearing on access to and use of the planet's resources.

The following pages provide an overview of the historical evolution of the sustainable development concept in the international development agenda and highlight the key milestones and bottlenecks in the evolving position of business in this context.



Silent Spring,[1] a book written by Rachel Carson and published in **1962**, is widely credited for having contributed to an understanding of the interconnections between the environment, the economy and social well-being. The book influenced the North American environmental movement by arguing that uncontrolled pesticide use, especially DDT (dichlorodiphenyltrichloroethane), was harming not only animals and bird populations, but also human beings and the environment.

1 The title of the book refers to a spring season in which no bird songs could be heard, because they had all disappeared as a result of a nature poisoned by pesticide abuse.

Thereafter environmental concerns began to grow among member countries of the Organization for Economic Co-operation and Development (OECD),[2] gaining initial attention during international debates and fora such as the 1969 Commission on International Development, the first international gathering to consider alternative approaches to development.

The United Nations also started to address environment and development as interlinked issues during the 1970s. The **United Nations Conference on the Human Environment** that took place in **Stockholm** in **1972** is considered to have been the **very first milestone for environmental action at intergovernmental level**.

Motivated by the pollution and acid rain problems of Northern Europe, the Stockholm Summit acknowledged the conflict between the prevailing development model and protection of the environment. The extensive international community gathered at the Summit concluded that **environmental problems were global in nature and should therefore be tackled globally by reducing the impact of humans on the environment**.

As an outcome of the Stockholm Conference, the United Nations Environmental Programme (**UNEP**) was created to promote international cooperation on environmental issues. Numerous environmental protection agencies were also established at national level as follow-up to the event.

Another milestone in global environmental concern was marked by the Club of Rome[3] whose controversial *Limits to Growth*[4] was published during that period. While industrialized countries criticized the report for not considering technological solutions, innovations and market signals (which would have allowed growth to continue, according to the economic theories prevailing at the time), developing countries feared the effects of slowing economic growth.

Its main conclusions were summarised by the authors as follows: "unless special attention is taken, human resource use and emission will continue to increase as a consequence of growth in population and human activity. Importantly, this 'human footprint' – if unchecked – will grow beyond the carrying capacity of the globe, that is beyond what the globe can provide on a sustainable basis. If such expansion into unsustainable territory is allowed to happen, decline – or collapse – in human

2 The Organization for Economic Co-operation and Development (OECD) is an international economic organization founded in 1961 to stimulate economic progress and world trade. It is a forum of countries committed to democracy and the market economy, providing a platform to compare policy experiences, seek answers to common problems, identify good practices and coordinate the domestic and international policies of its members. Most OECD members are high-income economies with a very high Human Development Index (HDI) and are regarded as developed countries.

3 The Club of Rome was founded in 1968 as an informal association of independent leading personalities from politics, business and science, men and women who are long-term thinkers interested in contributing in a systemic interdisciplinary and holistic manner to a better world: http://www.clubofrome.org/

4 In 1972 Donella and Dennis Meadows and a team from the Massachusetts Institute of Technology produced a report for the Club of Rome's Project for the Predicament of Mankind entitled *The Limits to Growth*. A world model was constructed to estimate the future impact of continuous exponential growth under a number of different assumptions.

resource use and emissions become unavoidable".[5]

The mathematical world model that supported the limits-to-growth theory was further analysed by the *Fundación Bariloche* to develop a *Latin American World Model*[6] which called for growth and equity for the least developed countries.

In addition, the 1973 **Organization of Petroleum Exporting Countries (OPEC) oil crises**, which had a major impact in both oil prices and oil availability, further powered the limits-to-growth debate, by providing clear evidence of the high dependence on oil that many countries had for their development and economic functioning. A series of **devastating industrial accidents** further raised concerns on environmental impacts of industrial production across the globe. The running aground of the *Amoco Cadiz* on Portsall Rocks near the north-western coast of France in 1978, which resulted in the largest oil tanker spill in history, along with the partial meltdown of a nuclear reactor core at *Three Mile Island* in Pennsylvania in 1979, are two examples of such accidents.

In consequence public opinion became more conscious and a strong attitudinal shift began to emerge in favour of **raising awareness on global environmental threats** and thus catalysing policy responses.

What is Sustainable Development?

To this day, the most frequently quoted definition remains the one from the Bruntdland Report: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:

- the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given; and
- the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs."

Source: World Commission on Environment and Development, Our common future, Oxford University Press, 1987

A turning point in this heightened awareness was the release of ***Our Common Future,*** the report published by the World Commission on Environment and Development (WCED) in **1987**. Also known as the *Bruntdland Report,*[7] it marked the beginning of the era of **sustainable development**.

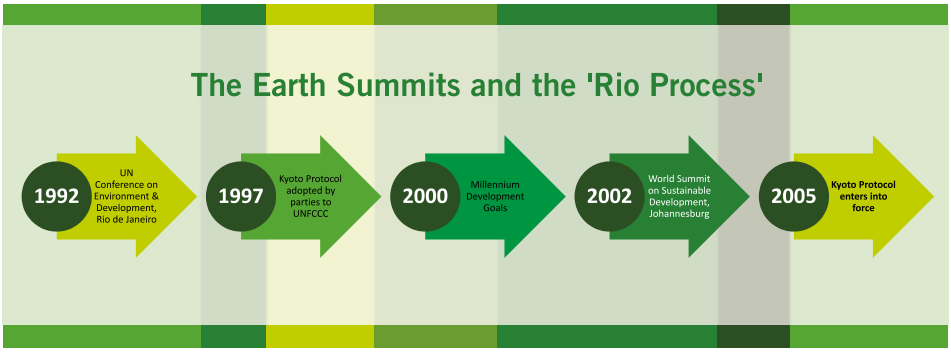
5 Source: http://www.clubofrome.org/flash/limits_to_growth.html. Donella H. Meadows, Dennis L. Meadows, Jørgen Randers and William W. Behrens III published updates of the reports in 1992 and 2004. Fact sheets, videos and further updates of their research can be found at: http://www.clubofrome.org

6 Latin American World Model. Proceedings of the Second IIASA Symposium on Global Modelling: http://webarchive.iiasa.ac.at/Admin/PUB/Documents/CP-76-008.pdf

7 Named after the Chairman of the WCED, Gro Harlem Brundtland.

Described as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs", the concept of sustainable development has been a landmark guiding principle for a quarter-century.

By focusing on multilateralism and the interdependence of nations in the search for a sustainable development path, the report sought to recall the spirit of the aforementioned United Nations Conference on the Human Environment in Stockholm, which had introduced environmental concerns into the formal political development arena. *Our Common Future* placed **environmental issues on the political agenda**. Furthermore, by aiming to discuss the environment and development as a single issue, the report is also remembered as a key preparatory step towards the **United Nations Conference on Environment and Development** held in the summer of **1992** in **Rio de Janeiro**, Brazil.



The 1992 Rio Conference, popularly referred to as the *Earth Summit*, was the first UN conference open to Civil Society. In addition to government bodies, various NGOs were invited to actively participate in the event. It also represented **the first step for the business sector in focusing on sustainable development**. A global business organization (the Business Council for Sustainable Development – which later became the World Business Council for Sustainable Development, WBCSD) was created to coordinate the business sector's participation in the summit. Its success led to a book, *Changing Course: a global business perspective on development and the environment*, which brought together the expertise of more than 50 global business leaders to **show how the business community could achieve environmental protection coupled with economic growth**. *Changing Course* was a fundamental publication as it demonstrated how business could put into action the concept of "eco-efficiency".

Changing Course: A global business perspective on development and the environment

Sustainable development can only be achieved if market forces are allowed to operate freely and if the "polluter pays" principle is integrated into environmental and economic policy.

This belief links all the recommendation presented in *Changing Course*.

Source: http://www.wbcsd.org/pages/edocument/edocumentdetails.aspx?id=72&nosearchcontextkey=true

The concept of eco-efficiency

"The 1992 Earth Summit endorsed eco-efficiency as a means for companies to implement Agenda 21 in the private sector, and the term has become synonymous with a management philosophy geared towards sustainability. According to the WBCSD definition, eco-efficiency is achieved through the delivery of '...competitively priced goods and services that satisfy human needs and bring quality of life while progressively reducing environmental impacts of goods and resource intensity throughout the entire life-cycle to a level at least in line with the earth's estimated carrying capacity'. This concept describes a vision for the production of economically valuable goods and services while reducing the ecological impacts of production. In other words eco-efficiency means producing more with less."

Source: http://www.iisd.org/business/tools/bt_eco_eff.aspx

The results of the Earth Summit included the **Rio Declaration** enunciating 27 principles of environment and development, namely **Agenda 21**, and a **Statement of Principles for the Sustainable Management of Forests**, all of which were adopted by the Conference.

The institutional innovation resulting from the Earth Summit included an agreement on the operating rules for the Global Environmental Facility (GEF)[8] and the establishment of the UN Commission on Sustainable Development (CSD), on the basis of the Agenda 21 recommendation.

The Agenda 21

Agenda 21 is a comprehensive plan of action to be taken globally, nationally and locally by organizations of the United Nations System, Governments, and major groups in every area in which human activity impacts on the environment.The "21" in Agenda 21 refers to the 21st Century. It provides a blueprint for rethinking economic growth, advancing social equity and ensuring environmental protection.

Agenda 21 was adopted by more than 178 Governments at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, 3–14 June 1992.

Source: http://sustainabledevelopment.un.org

Full text of the Agenda 21: http://sustainabledevelopment.un.org/content/documents/Agenda21.pdf

8 The Global Environment Facility (GEF) unites 183 countries in partnership with international institutions, civil society organizations (CSOs), and the private sector to address global environmental issues while supporting national sustainable development initiatives. Today the GEF is the largest public funder of projects to improve the global environment. An independently operating financial organization, the GEF provides grants for projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants.

Three important Conventions for environmental protection also came out of the Earth Summit. Although these Conventions were the products of differing and independent negotiating processes, they are referred to as the Rio Conventions:

CBD http://www.cbd.int	**United Nations Convention on Biological Diversity** The objectives of the CBD are the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising from commercial and other utilization of genetic resources. The agreement covers all ecosystems, species and genetic resources.	The **UN Convention on Biological Diversity** was presented for signature on 5 June 1992 at the Earth Summit. It remained open for signature until 4 June 1993 by which time it had accumulated 168 signatures. It came into force on 29 December 1993, 90 days after the 30th ratification.
UNCCD http://www.unccd.int	**United Nations Convention to Combat Desertification** The UNCCD aims to combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification, particularly in Africa, through effective action at all levels, supported by international cooperation and partnership arrangements, in the framework of an integrated approach consistent with Agenda 21, with a view to contributing to the achievements of sustainable development in affected areas.	The **UN Convention to Combat Desertification** (UNCCD) in those countries experiencing serious drought or desertification, particularly in Africa, is the only Convention stemming from a direct recommendation of the Rio Conference's Agenda 21. It was adopted in Paris on 17 June 1994 and entered into force in December 1996.
http://unfccc.int/2860.php	**United Nations Framework Convention on Climate Change** The UNFCCC sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. Its objectives are to stabilize greenhouse gas (GHG) concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system, within a time-frame sufficient to allow ecosystems to adapt naturally to climate change; to ensure that food production is not threatened; and to enable economic development to proceed in a sustainable manner.	The **UN Framework Convention on Climate Change** was also was presented for signature on 5 June 1992 at the Earth Summit and entered into force on 21 March 1994. Today it has near-universal membership. The 195 countries that ratified the Convention are Parties to the Convention. By 1995 countries realized that the emission reduction provisions in the Convention were inadequate and they launched negotiations to strengthen the global response to climate change and, two years later, adopted the **Kyoto Protocol**.[9]

9 Source: http://unfccc.int/essential_background/items/6031.php

While being separate legal instruments, these three Conventions are nonetheless intrinsically linked. Each represents one means of contributing to the sustainable development objectives of Agenda 21, while addressing interdependent issues.

It is also important to note that these Conventions, among others, are "Multilateral Environmental Agreements" (MEAs): they are **environmental agreements with commercial clauses** that have a direct impact and consequences on the everyday work of business. Furthermore the Word Trade Organization, through its Environment and Commerce Committee, works with these Conventions as well as others relating to waste, hazardous substances and chemicals.[10]

One of the results of negotiations under the UN Framework Convention on Climate Change, currently signed by 195 countries, was the adoption in 1997 and entry into force in 2005 of the **Kyoto Protocol** that established a compulsory goal of a 5 per cent reduction of GHG emissions compared to 1990 levels over the five-year period 2008-2012 among developed countries. It only bound developed countries[11] because it recognized that they were largely responsible for high levels of GHG emissions in the atmosphere, which were considered the result of more than 150 years of industrial activity.

The Kyoto Protocol and the beginning of a new commitment period

Owing to a complex ratification process, the Kyoto Protocol adopted in 1997, entered into force on 16 February 2005 by setting binding emission reduction targets for 37 industrialized countries and the European Community in its first commitment period (which started in 2008 and ended in 2012). Overall these targets added up to an average reduction in emissions of five per cent compared to 1990 levels over the five-year period 2008-2012.

However the fact that the USA, one of the highest global emitters, never ratified it, reduced significantly its expected impacts. In Doha, Qatar, on 8 December 2012, the Doha Amendment to the Kyoto Protocol was adopted. This launched a second commitment period, to last from 1 January 2013 until 2020. The impact of the **Paris Agreement**, adopted at the **COP21 in Paris in 2015**, will be felt at country level where efforts must be increased to raise the level of ambition about global emission reductions, and more broadly to enhance capacities to support the integration of sustainability goals into national development plans and strategies. An increasing number of companies are adjusting their business models to deal with climate change challenges effectively and investing in progressive actions to reduce emissions and to develop adaptive capacities.

Source : http://unfccc.int/essential_background/kyoto_protocol/items/6034.php

10 For example the Stockholm Convention on Persistent Organic Pollutants (POPs) regulates some of the chemicals that present the greatest risks to humans and wildlife.
11 Following the Rio Principle of 'common but differentiated responsibility'.

The Rio Declaration has established the basic structure of a new legal environmental framework. Although all 27 Principles are important, in addition to the overarching principle of sustainable development two other principles are particularly relevant, namely:

- the 'common but differentiated responsibility' principle (principle 7)
- the 'precautionary' principle (principle 15)

Principle 7 of the Rio Declaration provides the first formulation of the meaning of 'common but differentiated responsibility', by stating: "In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command." Another formulation of the same principle is provided in Article 3 on the UNFCCC principles, which adds the notion of respective capabilities to the notion of common but differentiated responsibility:"In their actions to achieve the objective of the Convention and to implement its provisions, the Parties shall be guided, inter alia, by the following: 1. The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof."

Principle 15 of the Rio Declaration notes: "In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."

These principles are important as they recognise the fact that developed and developing countries do not have the same roles or bear the same responsibilities in addressing global environmental challenges. The precautionary principle is significant because it explains the idea that scientific uncertainty should not preclude preventative measures to protect the environment. At the same time it must be applied conscientiously as it could otherwise have a paralyzing effect on growth.

The Earth Summit had a number of additional consequences. For example, the International Organization for Standardization (ISO)[12] began to develop standard ISO 14000 on Environmental Management Systems[13] following the Conference and the participation of business in the Summit. Some have argued that the ISO 14000 tool, which was eventually launched in 1996, was a direct result of the 1992 Rio Conference.

12 http://www.iso.org/iso/home/about.htm
13 Environmental Management Systems are extensively explained in Section 3.

At the beginning of the new millennium, in September 2000, world leaders endorsed the Millennium Declaration, a commitment to work together to build a safer, more prosperous and equitable world and to eradicate poverty. The Declaration was translated into a roadmap setting out eight time-bound and measurable goals to be reached by 2015, known as the Millennium Development Goals (MDGs).

In **2002**, ten years after the Rio Declaration, the **World Summit on Sustainable Development (WSSD)** was convened in Johannesburg as a follow-up to the Earth Summit with a view to renewing the global commitment to sustainable development. The outcome of the 2002 Summit did not, however, meet the expected level of commitment to action by Governments. In numerous controversial areas such as energy, trade and corporate accountability, no specific targets were set and diverging interests between the North and the South precluded a number of anticipated agreements.

The Johannesburg Summit did however serve to strengthen the principles of the Rio Conventions by setting targets and an agreed plan of implementation (the Johannesburg Plan of Implementation) in some key areas of development concern, namely water and sanitation, global warming, biodiversity and natural resources protection, and health.

The 2002 Summit also had a number of **consequences for the business sector**, particularly through the following outcomes:

- The concept of Public-Private Partnership was strengthened, allowing for the intensive development of different initiatives on sustainable issues.
- Corporate Social Responsibility (CSR) was also able to gain relevance in this context. The UN Global Compact launched in 1999 was seen as the main document on the subject.
- While the 1992 Earth Summit allowed for the development of the ISO 14000 norm (standards relating to environmental management), the 2002 Johannesburg Conference initiated the process of creating an ISO norm on Social Responsibility. Finally the ISO 26000 Guide was published in 2010. It should be noted that the Guide on Social Responsibility was developed through a democratic, participatory and balanced process in which both developed and developing countries were represented and various stakeholders were able to participate, thus influencing the outcome document. It should also be noted that the definition of *social responsibility* also makes direct reference to the concept of sustainable development. The Guide is currently the basic and fundamental tool used by business (among others actors) to create and maintain social responsibility initiatives.

ISO 26000 – Social responsibility

"Business and organizations do not operate in a vacuum. Their relationship to the society and environment in which they operate is a critical factor in their ability to continue to operate effectively. It is also increasingly being used as a measure of their overall performance. ISO 26000 provides guidance on how businesses and organizations can operate in a socially responsible way. This means acting in an ethical and transparent way that contributes to the health and welfare of society."

Source: http://www.iso.org/iso/home/standards/iso26000.htm

1.1.2 The outcomes of Rio+20 and its implications for business

Twenty years after the first Earth Summit, delegates representing governments, the private sector, NGOs and other interest groups gathered again in Rio de Janeiro on **20–22 June 2012** to hold the **United Nations Conference on Sustainable Development (UNCSD)**, also referred to as **Rio+20**.

The objective of this major event was to secure renewed global political commitment to sustainable development and to discuss and agree on how to jointly reduce poverty, advance social equity and ensure environmental protection on a crowded planet in order to achieve *The Future We Want*, the title of the Summit's outcome document. The overarching sustainable development framework was still rooted in its original definition, as stated in the aforementioned Brundtland report and consisting of the well-known three pillars, namely economic development, social development and environmental protection.

The Rio+20 Conference focused on two broad themes:

- a green economy in the context of sustainable development and poverty eradication; and
- an institutional framework for sustainable development.

Controversy surrounded discussions on the concept of "green economy"[14] before and during the Rio+20 Conference, with tension evident between developed and developing countries. Two main issues arose in this international discussion, namely (i) the fear of changing the focus away from "sustainable development" toward "green economy", and (ii) the possibility that the concept of "green economy" would create new barriers to international commerce. To address these concerns the United Nations decided that the concept of "green economy" must always be followed by "in the context of sustainable development and poverty eradication".

The second theme discussed at the Rio+20 Conference was an institutional framework for sustainable development. After some deliberation regarding such a framework, a decision was made to strengthen and upgrade the United Nations Environment Programme (UNEP), including through universal membership of the UNEP Governing Council.[15] Furthermore, the Conference agreed that **the Commission on Sustainable Development** (CSD) would be replaced by **a High Level Political Forum**, the responsibility of which would be to "follow up on the implementation of sustainable development and should avoid overlap with existing structures, bodies and entities in a cost-effective manner." The business community made itself more visible than ever before in the preparation and implementation of the Rio+20 Conference, particularly through the afore mentioned WBCSD and its report ***Vision 2050*** which sets out what business thinks a sustainable world would look like in 2050.

14 See: www.unep.org/greeneconomy

15 In March 2013, the General Assembly adopted resolution A/RES/67/251, formally changing the designation of the UNEP Governing Council to the "United Nations Environment Assembly". Now all the 193 United Nations member States, Observer States and other stakeholders participate in discussions and decision-making on issues that affect the state of the environment and global sustainability.

WBCSD Vision 2050

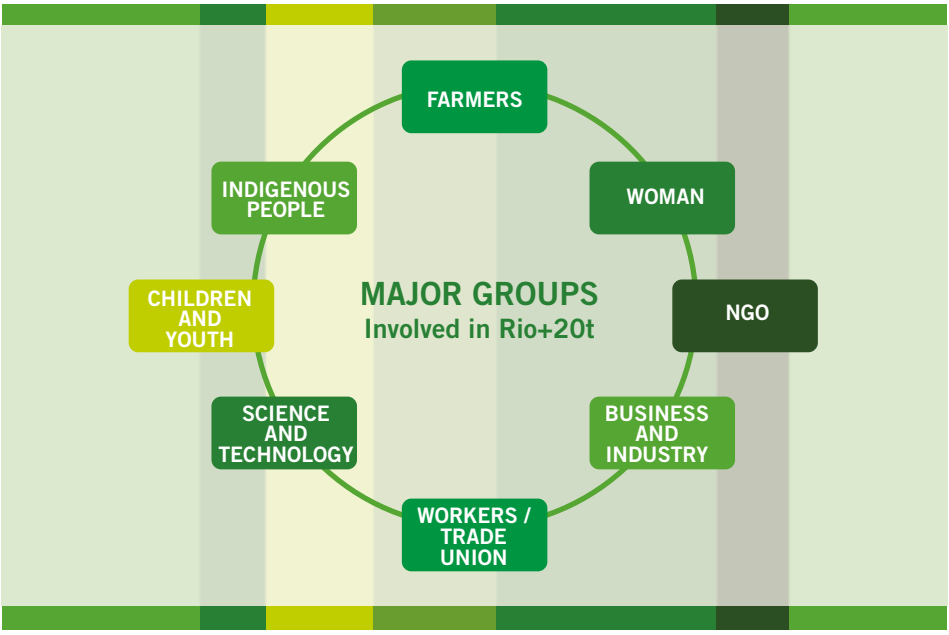
The WBCSD's cornerstone report *Vision 2050* calls for a new agenda for business, laying out a pathway to a world in which nine billion people can live well and within the planet's resources, by mid-century. It was compiled by 29 leading global companies from 14 industries and is the outcome of dialogue with CEOs, experts and more than 200 companies and external stakeholders in some 20 countries. The report features a set of agreed "must-haves", which include:

- incorporating the costs of externalities, starting with carbon, ecosystem services and water, into the structure of the marketplace;
- doubling agricultural output without increasing the amount of land or water used;
- halting deforestation and increasing yields from planted forests;
- halving carbon emissions worldwide (based on 2005 levels) by 2050 through a shift to low-carbon energy systems; and
- improved demand-side energy efficiency, and providing universal access to low-carbon mobility.

More information at: http://www.wbcsd.org/vision2050.aspx

The Future We Want, outcome document adopted at Rio+20, is an ambitious sustainable development framework for meeting the needs of both people and planet. The document highlights a wide range of issues to be considered:

However, experts from different organizations agreed that the most important outcome of Rio+20 was neither a document nor a treaty but rather its catalyzing call to make sustainable development a global priority. The active participation of several interest groups, including Business and Industry,[16] Trade Unions and Civil Society at large through the parallel People Summit, made it a world forum, inclusive of different and diverging opinions.



On the basis of the post-event official declarations made by the various interest groups, the following can be identified as the main **positive outcomes** of Rio+20:

- The event made global sustainable development a priority on the international agenda and launched a formal process for developing a set of Sustainable Development Goals (SDGs) as a follow-up to the poverty-eradicating mission of the Millennium Development Goals which will lapse in 2015.
- Despite the controversy, the discussion on the green economy brought attention to the fact that its definition has to be agreed and acted upon at national and local levels and among public and private stakeholders and Civil Society, taking into account countries' specific needs and capacities.
- In addition to the Outcome Document, *The Future We Want*, by the end of the Conference over 700 voluntary commitments had been compiled into

16 The voice of business in the international sustainable development debate has been consolidated since the first Earth Summit. From being one of nine "major groups" recognized by Agenda 21, business and industry have engaged in the pursuit of sustainable development by providing fundamental inputs into the Rio+20 preparatory and follow-up processes.

an online registry managed by the Rio+20 Secretariat, "initiating a new bottom-up approach towards the advancement of sustainable development".[17] "Governments, private companies, and multilateral agencies committed themselves to voluntary pledges worth $513 billion toward a series of development projects. Eight international development banks agreed to invest $175 billion to sustainable public transport systems over the next decade. Private sector companies pledged to contribute $50 billion to a plan to provide energy to the entire global population by 2030. However, the degree to which these pledges will be fulfilled remains uncertain, particularly in a time of persistent global economic downturn."[18] As mandated by the Conference outcome, this registry of commitments will continue to welcome registrations and deliver transparent and accessible information as part of the follow-up process.

- The financial and insurance sector signed the Natural Capital Declaration, which includes a commitment to build natural capital criteria into financial products and services.

The Natual Capital Declaration

The Natural Capital Declaration (NCD) is a finance sector initiative, endorsed at CEO-level, to integrate natural capital considerations into loans, equity, fixed income and insurance products, as well as in accounting, disclosure and reporting frameworks. The Natural Capital Declaration was launched at the UN Conference on Sustainable Development (Rio+20) in 2012. It has been signed by the CEOs of more than 40 financial institutions and demonstrates their commitment to the integration of natural capital considerations into private sector reporting, accounting and decision-making by 2020.

For more information, see: http://www.naturalcapitaldeclaration.org/

17 Source: http://sustainabledevelopment.un.org
18 Source: http://www.cfr.org/energyenvironment/examining-rio20s-outcome/p28669

In addition to positive outcomes, there were however a number of controversial areas:

- The word 'commitment' hardly appears in the outcome document.
- The discussion on the green economy was quite controversial and its most anticipated outcome – a solid financial and legal framework at global level – was not achieved owing to diverging interests between developing and developed countries.
- Even if pursuing a green economy at national level could be more effective (provided that the necessary political will is present), national-level commitments were a disappointment to many attendees who "would have welcomed more concrete and rigorous global commitments related to the transition to green economy" (EU press 2012).

Official statements at the closing of Rio+20

The closing statements of different organizations at Rio+20, show the diverse and often controversial range of perspectives.

WBCSD (2012) Business closing statement on Rio+20: http://www.wbcsd.org/rio-20/rio20.aspx

Full list of statements available at: http://www.uncsd2012.org/statementslibrary.html

The key lesson is that, since the first Earth Summit in 1992 and subsequent events described in this section, sustainable development has become part of the international lexicon and the main agenda of the United Nations. However, although the concept has been incorporated in many UN declarations and their implementation plans ("they all recognize how difficult it has proven to grant the environmental pillar the same recognition enjoyed by the other two pillars despite the many calls by scientists and civil society signalling the vulnerability and precariousness of the earth since the 1960s."),[19] this process indicates **recognition that business needs to be part of the policy development process since enterprises are the main sources of delivering action and providing solutions in this complex transition process**.

19 Source: http://www.uncsd2012.org/history.html

Business Day at Rio+20

The position of business in the sustainable development debate has evolved since the first Rio Conference. It is important to note its contribution, especially regarding the results of the Business Day at Rio+20 organized by the **Business Action for Sustainable Development (BASD 2012)**, a temporary coalition of the foremost business leaders and organizations committed to sustainable development which served as the official UN representation of Business & Industry for Rio+20. It was convened by the International Chamber of Commerce (ICC), the World Business Council for Sustainable Development (WBCSD) and the United Nations Global Compact (UNGC). The BASD 2012 Business Day hosted more than 800 leaders of government, businesses, UN representatives, NGOs and other organizations. The one-day event was the culmination of a year-long process to ensure that the business input into the Rio conference was heard and understood. During this Business Day 25 sessions were held, addressing a broad range of industry sector and cross-sector issues.

The key messages of the event included:

- "Business recognizes the need for urgent action to address sustainability challenges, and urges government to engage with the private sector to address this need.
- Businesses, and other organizations, are actively moving forward, with or without formal action at international level, to promote both corporate sustainability and sustainable development in general.
- While celebration of the progress made since 1992 is merited, particularly in terms of the investments made by business in global sustainability, we recognize that these efforts have not had the desired impact at global level; we remain on an unsustainable path.
- Business commits to 'scaling-up' collective efforts to address the growing lack of sustainability in our global consumption patterns.
- Business is the primary investor in, and the primary solution provider for, sustainable development.
- The vast majority of the technology and skills necessary to achieve sustainable development at scale already exist.
- Collectively, we face an implementation gap; collaboration between business and government, particularly at the local level, provides the best hope for an accelerated transition to a green economy, and to a sustainable future."

Source: http://basd2012.org/

1.1.3 The 2030 Agenda for Sustainable Development and the role of business

The development agenda for the post-2015 was conceived as a United Nations-led process aiming to help define the future global development framework that will replace the **UN Millennium Development Goals (MDGs)**, the set of eight global development targets which came to an end in 2015. The UN Conference on Sustainable Development (Rio+20) established an intergovernmental working group to design **Sustainable Development Goals (SDGs)** as successors to the MDGs, and initiated an inclusive intergovernmental process – Member-State-led with broad participation from Major Groups and other Civil Society stakeholders and coordinated by the United Nations (UN) – to define the future global development framework.

Member States at the Rio+20 Conference specified that the SDGs should be:

- global
- for countries at all stages of development
- limited in number
- aspirational
- easy to communicate

They should address in a balanced way all three dimensions of sustainable development, be coherently integrated into the UN Development Agenda beyond 2015, and drive five important transformative shifts:

1. **Leave No One Behind**. In the new development framework we should move from reducing extreme poverty to ending it in all its forms. We should ensure that no person – regardless of ethnicity, gender, geography, disability, race or other status – is denied basic economic opportunities and human rights.
2. **Put Sustainable Development at the Core**. We have to integrate the social, economic and environmental dimensions of sustainability. We must act now to slow the alarming pace of climate change and environmental degradation, which pose unprecedented threats to humanity.
3. **Transform Economies for Jobs and Inclusive Growth**. A profound economic transformation can end extreme poverty and improve livelihoods, by harnessing innovation, technology, and the potential of business. More diversified economies, with equal opportunities for all, can drive social inclusion, especially for young people, and foster sustainable consumption and production patterns.
4. **Build Peace and Effective, Open and Accountable Institutions for All**. Freedom from conflict and violence is the most fundamental human entitlement, and the essential foundation for building peaceful and prosperous societies. At the same time people the world over expect their governments to be honest, accountable, and responsive to their needs. We are calling for a fundamental shift – to recognize peace and good governance as a core element of well-being, not an optional extra.

5. **Forge a New Global Partnership.** A new spirit of solidarity, cooperation and mutual accountability must underpin the post-2015 era. This new partnership should be based on a common understanding of our shared humanity, based on mutual respect and mutual benefit. It should be centred around people, including those affected by poverty and exclusion, women, youth, the aged, disabled persons, and indigenous peoples. It should include Civil Society Organizations, multilateral institutions, local and national governments, the scientific and academic community, businesses, and private philanthropy.

The final set of SDGs and the 2030 Agenda for Sustainable Development were adopted by Member States at the Sustainable Development Summit in September 2015.

Sustainable Development Goals

The 2030 Agenda for Sustainable Development is composed of 17 goals to end poverty, fight inequality and injustice, and tackle climate change by 2030:

1. End poverty in all its forms everywhere
2. End hunger, achieve food security and improved nutrition, and promote sustainable agriculture
3. Ensure healthy lives and promote wellbeing for all at all ages
4. Ensure inclusive and quality education for all and promote lifelong learning
5. Achieve gender equality and empower all women and girls
6. Ensure access to water and sanitation for all
7. Ensure access to affordable, reliable, sustainable and modern energy for all
8. Promote inclusive and sustainable economic growth, employment and decent work for all
9. Build resilient infrastructure, promote sustainable industrialisation, and foster innovation
10. Reduce inequality within and among countries
11. Make cities inclusive, safe, resilient and sustainable
12. Ensure sustainable consumption and production patterns
13. Take urgent action to combat climate change and its impacts
14. Conserve and use sustainably the oceans, seas and marine resources
15. Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss
16. Promote just, peaceful and inclusive societies
17. Revitalize the global partnership for sustainable development

The Sustainable Development Goals

Source: https://sustainabledevelopment.un.org

International business organizations have a critical role to play in the design and delivery of the 2030 Agenda for Sustainable Development. Even though the MDGs were a governmental compromise, with businesses not formally consulted in the development of the original goals established at the end of the last century, it was always important to focus on the relevance of the role played by the private sector.

From the perspective of business, the major international business organizations "believe that for the Post-2015 Goals to contribute to delivering the global development agenda it will be essential that they help stimulate business of all sizes around the world to grow and flourish in a responsible and sustainable manner". They agreed that it would be important to recognize "the critical need to invest in 'education for all' and to build human capital" and "the role of more inclusive business models – as sustainable business solutions that increase access to goods, services, and create new sources of income for low-income communities".[20] They finally concluded that "SDGs should include a clear dimension related to equitable economic growth, especially one emphasizing economic sustainability and inclusiveness. It is recognized that development objectives cannot be achieved without economic growth – but also that economic growth does not ensure sustainable development. Therefore, any SDG related to economic growth should strongly address employment, while also seeking to upgrade the quality of jobs."[21]

20 Joint business letter to the High-Level Panel of the Post-2015 UN Development Agenda, prepared by the UN Global Compact, Business Action for Africa, BIAC, ICC, OIE, WBCSD, Business Fight Poverty, Business in the Community, International Business Leaders Forum (March 2013). Also see the IOE report on "Update on Post-2015 Development Agenda" (April 2013).

21 Joint report to the High-Level Panel of the Post-2015 UN Development Agenda, prepared by the UN Global Compact and the World Business Council For Sustainable Development, with the support of the World Economic Forum and the High-Level Panel's Business Representatives (March 2013).

Key business actors at international level

The **International Organisation of Employers (IOE)** represents the interests of business in the labour and social dimensions of sustainable development at global level. Its mission is to promote and defend the interests of employers in international fora. It represents business in UNEP's major groups and is involved with the World Bank/UNEP initiative on the Green Economy as well as the ILO/UNEP work on Green Jobs.

The work of the IOE targets several policy areas, including Business and Human Rights, International Labour Standards, Environment and Climate Change, Youth Employment, Occupational Safety and Health, Employment, and Sustainability. The IOE focuses on the employment and social dimensions of these changes and believes that policy developments should anticipate and incorporate these influences on business and market behaviour. The IOE is committed to monitoring and influencing the employment and social policy dimensions of sustainable development, environment, climate change and green jobs to inform members of developments; help analyze the implications for enterprises; and provide effective employer advocacy in international fora.

By developing the employers' position on sustainability matters, the IOE has been working with other business organizations, such as the International Chamber of Commerce (ICC), the World Business Council for Sustainable Development (WBCSD) and the Industry Advisory Committee to the OECD (BIAC).

The **International Chamber of Commerce** was founded in 1919 to serve world business by promoting trade and investment, and open up markets for goods and services. It prepares policy products, including statements contributing to intergovernmental discussions, along with rules and codes to facilitate international business transactions. The Environment and Energy Commission of the ICC makes recommendations for business on significant regulatory and market issues concerning energy and environment. It is also working on the green economy task force established in 2010. The aim of this task force is to help business and industry understand the practical possibilities of a green economy, as well as opportunities and potential impacts by sector across global supply chains.

The **World Business Council for Sustainable Development** is a business organization created with the specific goal of promoting sustainable development.

The Industry Advisory Committee to the OECD is an independent international business association devoted to advising government policymakers at the OECD and related fora on the diversified issues of globalization and the world economy, including green growth.

These four worldwide business organizations have been working to present the business sector's perspective in all international sustainable development forums for the past 20 years. They have also helped national business organizations improve their advocacy and participatory functions, not only at international level but also in national discussions and initiatives. Many national business organizations have supported companies which take voluntary initiatives and adopt innovative solutions for resource efficiency, emission control, waste management, protection of ecosystems, and food and energy security.

As part of these efforts, the IOE developed a global vision for achieving sustainable development as an input into the Rio+20 Conference. Similarly, meetings and activities surrounding the intergovernmental processes of the post-2015 development agenda will become more elaborate and the IOE will continue to work within other business coalitions to organize and solidify its footing as a key player in these processes, for instance in the framework of the newly established Global Business Alliance for 2030.[22]

The process started early in 2013. Regional and national consultations took place all over the world, and discussions involved different actors across the globe.

By that time it was clear that this new development agenda would affect the way in which businesses should develop and behave. The SDGs will effectively determine the international development system for the upcoming fifteen years. Unlike the Millennium Development Goals (MDGs), the new SDGs specifically demand businesses to discover solutions and improve the situation concerning sustainable development challenges. "As the world realigns itself with this new framework, it will be imperative for companies to understand, prioritize and embed the SDGs into the core of their businesses".[23]

Business for 2030: case studies of private sector contributions to sustainable development through the filter of the SDGs

United States Council for International Business (USCIB) developed a portal dedicated to showcase business' past and continuing contributions to sustainable development through the prism of the SDGs. The goal of the site is to stimulate a more productive partnership between the public and private sectors at the UN and at national levels and to demonstrate the need for a proportionate role for business in the negotiations, implementation and follow-up mechanisms of the 2030 development agenda at both the UN and at national levels.

http://www.businessfor2030.org/

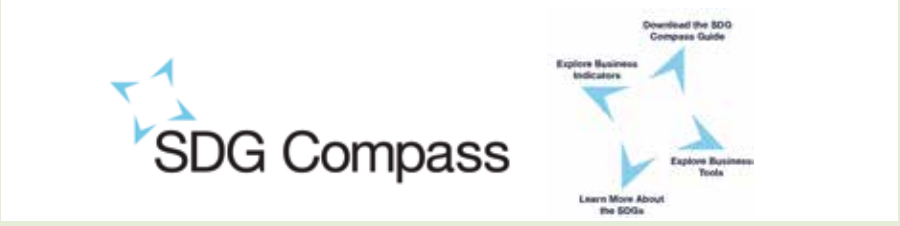
22 Source: International Organisation of Employers: *Update on Post-2015 Development Agenda* (Geneva 2013).
23 Source: RESPACT, Austrian Business Council for Sustainable Development: https://www.respact.at/site/themen/csrundpolitik/article/6766.html

The Business position on the SDGs

The business sector believes that for the SDGs to contribute to the delivery of the global development agenda, they must help stimulate business of all sizes around the world to grow and flourish in a responsible and sustainable manner. Key to this objective will be recognition of:

- the need for good governance, the rule of law and well-functioning national institutions, particularly in protecting real and intellectual property and land rights, and in reducing corruption and informality;
- the need to foster economic growth as well as trade and investment, promote entrepreneurship and establishment of new enterprises;
- the importance of access to finance (particularly for SMEs), transport, water, energy and healthcare infrastructures, and information and communications technologies;
- the critical need to invest in 'education for all' and build up human capital;
- the need to strengthen food and nutrition security;
- the empowerment of women as important contributors to economic development; and
- the role of more inclusive business models as sustainable business solutions that increase access to goods and services and create new sources of income for low-income communities.

SDG Compass: The guide for business action on the SDGs



GRI, UN Global Compact, and WBCSD have launched a unique guide that can help business align its strategy with the SDGs, and provide tools for managing and measuring progress along the way. The guide is developed with a focus on large multinational enterprises.

For more information, see: http://sdgcompass.org

1.2 Understanding the green economy and its impact for the world of work

The ILO has a long-standing involvement with sustainable development in relation to its mandate for advancing social justice through promotion of decent work. Although its contribution to the environmental debate is less known and recognized, many of the ILO instruments adopted over the past 40 years refer to or have an impact on the working environment and its connection with the external environment as a whole.

This chapter presents the world of work contribution to environmental sustainability, by:

- highlighting the interventions made by the ILO and its constituents in the international conferences discussed in the previous chapter;
- introducing the green economy definition, its related concepts and the inter-linkages with the world of work;
- reporting on recent developments in the ILO debate on 'sustainable development, green jobs and decent work' while summarizing the role and perspectives of social partners.

1.2.1 The ILO's involvement in the sustainable development debate

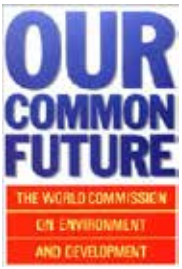
Early focus on environmental matters ('70s and '80s)

The ILO's early focus on environmental matters represented the linkage between the working environment and the general environment.

1972 *ILC Resolution Concerning the Contribution of the ILO to the Protection and Enhancement of the Environment Related to Work* (ILO, 1972).

In the same year when the UN organized the Stockholm Conference on the Human Environment, the International Labour Conference (ILC) adopted the *Resolution Concerning the Contribution of the ILO to the Protection and Enhancement of the Environment Related to Work* (ILO, 1972). The Resolution emphasized that the working environment is an important and integral part of the human environment as a whole and called for an extension of ILO research in the areas of protection

and improvement of the working environment in the various economic sectors, along with consideration of these problems by the ILO's Industrial Committees.[24]



1987 — *The ILO Director General's report to the 77th Session of the ILC in 1990 was entitled Environment and the World of Work*

In response to the growing concern with sustainable development following publication of the Brundtland Report in 1987, the ILO Director General's report to the 77th Session of the ILC in 1990 was entitled *Environment and the World of Work*. The ILC Resolution adopted by the Conference focused on the ILO's role in relation to the environment, with particular attention to the need to increase workers' and employers' education in environmental protection and sustainable development issues and their impact on the world of work.

The ILO in the Rio Process (1992, 2002 and 2012)

1992 — *ILO Agenda 21* to place world-of-work priority issues within the final text of Agenda 21.

The ILO's main contribution to the 1992 *Earth Summit* centered on the preparation of an *ILO Agenda 21* in support of the negotiations, in order to place world-of-work priority issues within the final text of the global Agenda 21 as well as inserting references to employment matters in the Rio Declaration.

24 Initial discussions that led to the adoption of *Convention 174 on Prevention of Major Industrial Accidents* (1993) also started during those same years.

2002

Significantly enhanced profile for employment and social issues within the Declaration. Role of decent work in achieving sustainable development highlighted.

The active participation of the ILO in the preparation and implementation of the *World Summit on Sustainable Development (WSSD), Johannesburg, 2002* helped to significantly enhance the profile of employment and social issues within the Johannesburg Declaration and its Implementation Plan. In particular the role of the *ILO's Decent Work Agenda* and its tripartite constituency in achieving sustainable development was highlighted, through the participation of a tripartite delegation at the Summit.

The World Summit in 2002 was an opportunity to "identify how the ILO and its constituents might help facilitate the management of change, which is expected to escalate rapidly as a result of new economic, technological and social initiatives related to promoting change in production and consumption patterns, particularly in industrialized countries, and in the protection and management of natural resources. Such changes are expected to lead to a revolution in the next 10 to 20 years in what we produce, how we produce and what and how we consume, that will affect a very wide range of sectors including forestry, agriculture, mining, transport, energy, tourism, fisheries, construction, and manufacturing. In view of the ILO's tripartite structure, [...] the ILO may be able to play a useful role in facilitating dialogue between the social partners and others on the ways and means to manage such change in an economically, environmentally and socially responsible manner, that is, in a more sustainable way."[25]

2012

ILO endorsing a set of key messages calling for stronger coherence between the three pillars of sustainable development and emphasizing the importance of creating more and better employment opportunities while furthering the transition to a green economy.

Finally, the ILO participated in the United Nations Conference on Sustainable Development (Rio+20), held from 20 to 22 June 2012 in Rio de Janeiro, Brazil. The objective was to call for stronger coherence between the three pillars of sustainable development and urge the importance of creating more and better employment

25 Report on the discussion held at the *Committee on Employment and Social Policy* during the Governing Body meeting in March 2003.

opportunities while furthering the transition to a green economy. The ILO's contribution to the preparation of the zero-draft of the Rio+20 Outcome Document (*The Future We Want*) of the UNCSD included three key messages (ILO, 2011):

- **Implementation gaps:** ensure policy coherence in employment generation and poverty eradication by promoting sustainable enterprises and green jobs, and extending social protection while engaging with workers' and employers' organizations.
- **A framework of sustainable development and poverty eradication:** ensure a just transition to a green economy. Social protection, entrepreneurship and sustainable enterprise development in green sectors, and a just transition policy framework, should be adopted for workers and enterprises facing restructuring or having to adapt to climate change.
- **The institutional framework for a green economy and sustainable development:** ensure tripartite participation – by governments, employers and workers – in international, national, sectoral and local governance structures for sustainable development policy formulation and implementation. International labour standards provide an important normative framework and guidance.

The ILO's participation in the global climate change debate

In cooperation with its constituents the ILO has made progress in promoting policy coherence between climate and employment and labour policies in the negotiations under the UNFCCC. In recent years the ILO has actively participated in the annual Conferences of the Parties. With the support of developing and industrialized countries the Cancun Agreement of 2010 recognized the social and labour market dimensions of climate change. As a result of this continuous advocacy process, the need to take into account the imperatives of a just transition of the workforce and the creation of decent work was included in the Paris Agreement achieved at the COP 21 in 2015.

The ILO is also part of the task team on the Social Dimensions of Climate Change (SDCC), created under the Working Group on Climate Change of the High Level Committee on Programme (HLCP). This UN-wide partnership, co-led by the World Health Organization (WHO), the UN Department of Economic and Social Affairs (UN-DESA) and the ILO, aims to raise awareness among stakeholders of the importance of including the social dimension in climate change responses.

1.2.2 The international green agenda: concepts and definitions

Since the publication of the Brundtland Report in 1987, and following the first Earth Summit in 1992, the international community has been analyzing and discussing the **linkages between environmental challenges and economic and social development**.

Attention has increasingly been focused on the importance of **shifting to more sustainable patterns of consumption and production** and, more recently, **greener economies**. Consequently two processes have been taking place in parallel:

- At **national level** many governments, in seeking to enhance the quality of life of their citizens and achieve sustainable development goals for their countries, are discussing the appropriate strategies and the policies that need to be given priority.
- At **international level** the "green-agenda" is being mainstreamed into the work of the United Nations and its specialized agencies, including the ILO.

While these trends will have an immediate and direct impact on the way of doing business, there is still no consensus on a globally accepted definition of what "green" means when applied to the economy. It appears that, as the concept grows in popularity, it becomes increasingly controversial. Additional work is still required in order to achieve agreement on the concept and for the voice of business to be further included. International agencies propose working or operational definitions of terms such as "green economy", "green growth" and "green jobs", while emphasizing the importance of encouraging the national endorsement of these terms and their contextualisation through dialogue with social partners, especially for their implementation.

Numerous "green" concepts have emerged, proposed by different organizations, such as green growth, low carbon economy, circular economy, greening economy, and transition to greener economies, along with related concepts or essential means of implementation such as green investments, green skills, green workplace, and greening of the labour market.[26]

Although all these approaches appear to point in the same direction (i.e. showing a new path based on ecologically-compatible use of resources, economic efficiency and social gains) they do not have the same meaning and their relationship has not been clearly articulated. Consequently this may lead to different strategies when selecting policy options and instruments.

For the ILO and its constituents much of the discussion has been focusing on the potential for the green economy to contribute to social development, particularly poverty eradication and social inclusion, by providing new investment opportunities

26 Source: International Labour Office, 19th International Conference of Labour Statisticians: *Proposals for the statistical definition and measurement of green jobs* (Geneva 2013).

for sustained growth and job creation.

In order to understand the specific interests of employers' organizations, it is important to introduce the main green concepts and definitions.

Green economy

The green economy concept has received significant international attention over the past few years as a tool for addressing the 2008 financial crisis as well as being one of two themes for the 2012 UN Conference on Sustainable Development (Rio+20). This has resulted in a rapidly expanding literature including new publications on green economy from a variety of influential international organizations, national governments, think tanks, experts, non-government organizations and others.

"The term green economy was first coined in a pioneering 1989 report for the Government of the United Kingdom by a group of leading environmental economists, entitled Blueprint for a Green Economy (Pearce, Markandya and Barbier, 1989). The report was commissioned to advise the UK Government if there was a consensus definition to the term sustainable development and the implications of sustainable development for the measurement of economic progress and the appraisal of projects and policies. Apart from in the title of the report, there is no further reference to green economy and it appears that the term was used as an afterthought by the authors."[27]

What is a Green Economy?

UNEP defines a green economy as one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities.

"In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive. In a green economy growth in income and employment should be driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services. These investments need to be catalysed and supported by targeted public expenditures, policy reforms and regulation changes."

Source: UNEP http://www.unep.org

27 UN-DESA: *A Guidebook to the Green Economy* (UN Division for Sustainable Development, 2012).

In 2008 UNEP launched the Green Economy Initiative in the context of the international response to the multiple global crises and to propose a mix of policy actions that would stimulate economic recovery and at the same time improve the sustainability of the world economy. UNEP's definition of green economy is largely discussed in the *Green Economy Report*, a flagship document released in 2011 which describes how greening the world's economies lowers environmental risks and ecological scarcities that most hurt the poor and disadvantaged. Effectively, one of the goals of a green economy is to help reduce poverty while increasing resource efficiency and improving social welfare. A green economy, both as a transition process and an ultimate objective, has much to do with the Millennium Development Goals and is inextricably intertwined with many of the drivers and factors involved in trying to achieve them.

The green economy concept was initially limited to reduction of carbon emissions, given their impact on climate change, but has rapidly expanded to:

1. respond to all environmental challenges; and
2. go beyond the creation of environmental goods, services and jobs to include the broader dimensions of energy and resource efficiency, poverty eradication, social equity and human well-being.

This has been reflected in the following developments:

- As a result of the on-going collaboration between UNEP and the ILO (including its social partners represented by the ITUC and IOE), the debate on this concept has evolved into how to strategically transform the economic paradigm in order to achieve long term sustainable growth, development and promotion of decent work. This includes discussions on the greening of the entire economy and its transitional measures and costs.
- The Rio+20 Outcome Document, *The Future We Want*, considers the green economy as one of the important tools available for achieving sustainable development (paragraph 56) and invites Governments, with the support of the United Nations, to invest in research and knowledge creation on the analysis of its potential to contribute to poverty eradication and sustainable development in terms of both statistical and methodological capacity, along with policy evaluation.

Based on the foregoing, the main goal of the Green Economy Initiative is to enable policy-makers to agree on and implement effective policies and regulations that help reduce poverty, while increasing resource efficiency and improving social welfare, and thereby providing a secure and sustainable way of life for a growing world population. Its implementation includes three sets of activities:

1. promoting analysis of the macroeconomic, sustainability and poverty reduction implications of green investments in a range of sectors from renewable energy to sustainable agriculture, and providing guidance on policies that can catalyze increased investment in these sectors;

2. providing advisory services on ways of moving towards a green economy in specific countries; and
3. engaging a wide range of research bodies, non-governmental organizations, UN partners and the business sector in the implementation process.

However the concept met with criticism and resistance, as well as widespread inertia. An example of this paralyzing effect is what economists call the 'free-rider' problem: why should a country make an investment to lessen emissions if another country refuses, when the benefits of the investment go to both but the costs to only one?

From a business perspective, the **greening the economy** approach appears to be more widely accepted as it places emphasis on making **investments in technologies, systems and infrastructures** that enhance productive economic activities while optimizing natural resource utilization and minimizing environmental impacts. From this perspective, social and environmental objectives act as drivers for, instead of barriers to, sustainable economic growth.

This approach tends to highlight the need to avoid measures detrimental to growth while pursuing environmental benefits, stressing the assumption that both "green policies – to promote reduced carbon emissions – and growth policies – including to help pay for carbon reduction – are both important priorities."[28]

While the terms green economy and green growth might imply a strong focus on the intersection between environment and the economy, many of the proposed definitions also incorporate a social dimension. UN-DESA provides a useful summary of key words from the full list of definitions described in their publication *A Guidebook to the Green Economy*, categorised according to the three dimensions of sustainable development.

Green growth

The concept of green growth originated in the Asia and Pacific Region. At the Fifth Ministerial Conference on Environment and Development (MCED) held in March 2005 in Seoul, 52 Governments and other stakeholders from Asia and the Pacific agreed to move beyond the sustainable development rhetoric and pursue a path of "green growth". Since then at least 13 separate definitions for green growth have been identified in recent publications by international organizations.[29]

Among them, the World Bank and OECD define green growth as:

- "fostering economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which

28 Simon Less, *Greening the economy – not 'green economy'*, Policy Exchange, 2012. The current policy of subsidising select UK 'green' industries is based not on subsidies for such selected sectors being the best way to reduce carbon emissions, but that a principal objective of these public subsidies is to promote UK growth, exports and employment. This Research Note explores the likely impact of such 'green growth' policies, both for economic growth and emissions reduction.
29 UN-DESA: *A Guidebook to the Green Economy* (UN Division for Sustainable Development, 2012).

our well-being relies" (OECD);[30]
- "efficient in its use of natural resources, clean in that it minimizes pollution and environmental impacts, and resilient in that it accounts for natural hazards and the role of environmental management and natural capital in preventing physical disasters" (World Bank).[31]

More specifically:

- According to the OECD green growth is the means by which the current economy can make the transition to a sustainable economy. It involves promoting growth and development while reducing pollution and greenhouse gas emissions, minimising waste and inefficient use of natural resources, maintaining biodiversity, and strengthening energy security. Green growth promotes investment in environmental protection as offering a new source of economic growth. In line with the principles of sustainable development, the green growth paradigm responds to the need for a new model of growth that is much less intensive in resource consumption and that can lead to social well-being and poverty reduction in both developed and developing countries. A strategic vision is needed to ensure that policies are appropriate from the economic efficiency, environmental integrity and social equity standpoints, and coherent both from a national and an international perspective.
- According to the World Bank, growth is necessary, but it will be unsustainable in the long run unless it is both socially inclusive and environmentally sound. Inclusive green growth requires tackling political economy constraints, overcoming deeply entrenched behaviours and social norms and developing innovative financing instruments to change incentives and promote innovation and thus address the market, policy, and institutional failures that lead to the overuse of natural assets.

Green growth

Green growth is economic growth that is environmentally sustainable, as it fosters economic development "while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies." (OECD 2011)

"It is efficient in its use of natural resources, clean in that it minimizes pollution and environmental impacts, and resilient in that it accounts for natural hazards and the role of environmental management and natural capital in preventing physical disasters" (World Bank 2012).

30 OECD: *Towards Green Growth* (Paris, OECD, 2011).
31 The World Bank: *Inclusive Green Growth – The Pathway to Sustainable Development* (Washington, The World Bank, 2012).

The concept of **low carbon development** is also often used to describe forward looking national economic development strategies that prioritise low-emission and/or climate-resilient economic growth. The approach has its roots in the UNFCCC adopted in Rio in 1992 and has attracted interest in the climate negotiations as a soft alternative to voluntary or obligatory GHG emission reduction targets in developing countries.

Outside the UNFCCC negotiations, a growing number of world leaders, supported by international organizations, have promoted low-carbon development programmes and plans which often include provisions for reducing vulnerability to climate change impacts.

Keywords in published definitions of green economy and green growth

Title 1	Green economy	Green growth
Social	Human well-being; social equity; socially inclusive; reduced inequalities; better quality of life; social development; equitable access; addressing needs of women and youth.	Well-being, socially inclusive, access to basic commodities for the impoverished; meeting demands for food production, transport, construction, housing and energy.
Economic	Growth in income and employment; public and private investments; resilient economy; economic growth; new economic activity.	Economic growth and development; technology and innovation; environmentally sustainable economic progress; more resilient; sustained economic growth; driver for economic growth; new growth engines; green technology; new job opportunities; qualitative growth rather than simply increasing GDP; job creation or GDP growth.
Environmental	Reducing environmental risks and ecological scarcities; low carbon; resource efficient; reduce carbon emissions and pollution; enhance energy and resource efficiency; prevent loss of biodiversity and ecosystem services; within ecological limits of the planet; environmental responsibility; finite carrying capacity.	Protection and maintenance of natural assets and environmental services; provision of resources and services; low carbon; using fewer resources and generating fewer emissions; resource efficient; cleaner; climatic and environmental sustainability; energy and resource efficient; minimises pollution and environmental impacts; resilient to hazards; harmony between the economy and the environment; environmental protection; reduce GHG.

Source: UN-DESA, 2012.

Green jobs

As with the concept of green economy, there is currently no consensus on the definition of green jobs. Most studies take an industry approach, identifying green jobs in enterprises that produce green products and services, for example renewable energy products and services, clean transportation and fuels, buildings that are energy- and water-efficient, establishments reducing waste and pollution, and providing recycling products and services.

Other approaches identify the green jobs potential from both a product/service and production process perspective, for example energy-efficient manufacturing, distribution, and construction as well as the use of high efficiency strategies to reduce energy, materials and water consumption.

In this regard the ILO and UNEP offer a broader definition in their 2008 report *Green jobs: Towards decent work in a sustainable, low-carbon world*, which comprises employment in green sectors as well as green occupations in all sectors. It therefore includes employment in areas of economic activity that may not produce green products and services, for example construction, manufacturing or transport, but which operate in an environmentally-friendly manner.

In line with this broader approach some studies have focused on how different occupations contribute to greening of the economy (across all sectors), or have sought to define green jobs in terms of specific occupational groups.

Green jobs

According to the ILO's working definition, green jobs are positions in any economic sector (for example agriculture, industry, services administration) which contribute to preserving, restoring and enhancing environmental quality. Green jobs reduce the environmental impact of enterprises and economic sectors by cutting consumption of energy, raw materials and water; de-carbonizing the economy and bringing down emissions of greenhouse gases; minimizing or avoiding all forms of waste and pollution; and protecting or restoring ecosystems and biodiversity. More specifically, for the ILO green jobs are decent jobs that:

- improve efficiency of use of energy and raw materials
- limit greenhouse gas emissions
- minimize waste and pollution
- protect and restore ecosystems
- support adaptation to the effects of climate change

Source: ILO www.ilo.org/greenjobs

All these attempts supported by research and practice have contributed to the consolidation of a "working definition" of the concept of green jobs (i.e. a definition being developed and to be tailored and endorsed at national level to inform policies) which the ILO refers to in its technical and policy support work.

At enterprise level **green jobs can produce goods or provide services that benefit the environment**, for example green buildings or clean transportation. However, these green outputs (products and services) are not always based on green production processes and technologies. Therefore **green jobs can also be distinguished by their contribution to more environmentally-friendly enterprise production processes**. For example, green jobs can reduce water consumption or improve recycling systems.

Furthermore, green jobs can also be distinguished as jobs that directly contribute to **natural resource conservation** by protecting or enhancing environmental quality. For example, activities in forest and watershed management safeguard and improve the quality of the natural environment, ecosystems and associated environmental services.

The notion summarizes the transformation of economies, enterprises, workplaces and labour markets into a sustainable, low-carbon economic system providing decent work. However many of the required innovative strategies to promote green jobs can only succeed with the full involvement and participation of workers and enterprises.

The need for a statistical definition and measurement of green jobs was highlighted in the Rio+20 outcome document. In order to produce conceptual and practical guidelines on measurement of green jobs, the ILO Department of Statistics has begun work on draft proposals for a statistical definition of employment in the environmental sector, along with associated conceptual guidelines as a prerequisite for collecting statistics and producing internationally harmonized and comparable data.

Statistics on green jobs will help answer a number of questions concerning various aspects of environmental, economic and labour market policy, by providing governments with a tool for monitoring the transition to a greener economy, for designing and evaluating environmental and labour market policies and for assessing both their positive impact (such as job creation in specific industries, innovation take-up, market development, export growth) and their negative impact (such as potential job losses in traditional 'brown' industries and in the geographic regions where these industries are located).

For updated information of this work in progress on a statistical definition, the **ILO Green Jobs website** should be consulted regularly.

Employers' views on the concepts of green jobs and green economy

"Employers believe it is very important that we do not establish firm lines between "green jobs" and other jobs. The fact is that green jobs – whatever they might be – will, for the foreseeable future, rely and cohabitate with, other forms of jobs. To think otherwise risks stunting the growth of the very jobs that we might want to create. In other words we need to green all jobs. We need to green all enterprises, so far as we are able. If we do that we will have done a very great deal to achieve the right kind of transitions, both for workers and employers, and we will have engaged far more citizens in thinking about and acting upon the need for changes to the way in which we work and live if we are to truly achieve greener growth and a more sustainable future. [...]

We have similar views about the term "green economy". The term "green economy" suggests that we have two economies – the "green" one and the "normal" one. That is wrong-headed thinking. We need to green all of the economy. The OECD recognizes this in their recent very useful report on green growth when they speak at length of the idea of "greener" or greening growth.

So the real challenge for the greening of jobs and for greening growth will be to ensure that as many actors in the economy as possible understand what it means for them and that it empowers them to take action relevant to them and their colleagues."

Phil O' Reilly, Employers Spokesperson, Governing Body 312th Session, Geneva, November 2011.

1.2.3 The 'greening' of the ILO agenda

The Green Jobs Initiative and the ILO Green Jobs Programme

The 2007 Director-General's report to the International Labour Conference (ILC) *Decent Work for Sustainable Development* argued for the need to anchor the vision of sustainable development as the overriding policy paradigm within which the Decent Work Agenda can make its key contribution to development. **The report identified promotion of a socially just transition to green jobs as one of the key tasks for the ILO**.

Subsequently the ILO engaged in a partnership with UNEP, the International Organization of Employers (IOE), and the International Trade Union Confederation (ITUC) known as the Green Jobs Initiative. The objective of this initiative was to assess, analyze and promote the creation of decent jobs in the context of policies needed to address the global environmental challenges, and to support a concerted effort to promote coherent policies and effective programmes leading to a green economy with green jobs and decent work for all in a climate-challenged world.

The **Green Jobs Initiative** released two global reports:

Green Jobs: Towards decent work in a sustainable, low-carbon world (ILO, 2008) – the first comprehensive study on the emergence of a "green economy" and its impact on the world of work. It presents the characteristics of existing green jobs in renewable energy, buildings, transportation, basic industry, agriculture, and forestry, while discussing the effects of subsidies, tax reform, carbon markets and eco-labelling, among others, as key instruments in green policy. It also raises awareness of the need to pursue just transition, intertwining equity concerns with the need to train and educate a green workforce. Finally, it identifies the chronic and worsening levels of inequality both within and between countries as the major impediments to the expansion of green jobs, and underscores the efforts to advance pro-poor sustainable development, which is critical to green jobs creation across the world, particularly in developing countries.

Working towards sustainable development: Opportunities for decent work and social inclusion in a green economy (ILO, 2012) a joint ILO/UNEP study published in collaboration with the International Institute for Labour Studies. This report demonstrates that employment and social inclusion must be integral parts of any sustainable development strategy and must be included in policies that address climate change and ensure preservation of the environment. Through an in-depth analysis of eight economic sectors, the report shows that, if accompanied by the right policy mix, a green economy can

also create more and better jobs, lift people out of poverty and promote social inclusion.

As part of this process, the global ***Green Jobs Programme of the ILO*** was created in 2009 under the guidance of the ILC and the Governing body to promote creation of green jobs worldwide. The programme operates at various levels, namely:

- promotion of international policy coherence through research and advocacy;
- provision of support to constituents at national level through policy and technical advisory services; and
- capacity development of constituents and partners through training and knowledge-sharing.

Sustainable Development, Decent Work and Green Jobs at the ILC 102nd Session in 2013

At its 312th Session in November 2011, the Governing Body placed "sustainable development, decent work and green jobs" as an item on the agenda of the 102nd Session of the International Labour Conference (2013) for general discussion. This topic had not featured on the agenda of the Conference since 1990 and the extent of the environmental and social challenges, knowledge of the relationships between environmental sustainability, employment, social protection and incomes, and the political resolve to act on these relationships, had all evolved dramatically since that time.

The Committee's preparations included publication of the ***Report on Sustainable Development, Decent Work and Green Jobs*** as the basis for the discussion, during which the ILO tripartite constituents were asked to provide recommendations on how to address the two defining challenges of the 21st Century, namely achieving environmental sustainability and turning the vision of decent work for all into a reality.

The ***Conclusions*** of the 2013 ILC set out a common vision for achieving decent work, green jobs and sustainable development and underscore the critical role of governments, employers and workers as agents of change, both individually and collectively. They also provide guiding principles on the greening of economies, enterprises and jobs, including building a strong social consensus on (i) the goal of and pathways to sustainability, (ii) the important role of social dialogue, and (iii) respect for and promotion and realization of fundamental principles and rights at work.

The ILC discussion presented a unique opportunity for the ILO constituents to share their views and for the interest groups to consolidate their vision of the aforementioned policy areas. **The vision of the Employers' Group at the Committee is discussed in greater detail in Section 4**.

The role of social partners

In line with the Conclusions of the 2013 International Labour Conference, social partners are expected to:

- raise awareness and understanding, as well as provide guidance for their members on developments relevant to the greening of enterprises and the creation of decent green jobs;
- play an active role in the formulation, implementation and monitoring of national sustainable development policies, articulating the pivotal role of employers and workers in bringing about environmental sustainability with decent work and social inclusion;
- promote the active participation of their members in social dialogue at enterprise, sectoral and national levels to assess opportunities and resolve challenges posed by transition; and
- foster a culture of dialogue and workplace cooperation to improve resource efficiency, reduce waste, apply safe and clean technologies and working methods, and improve job quality.

Guidelines for a Just Transition, 2015

At the 325th Session of the Governing Body, in November 2015, the ILO adopted the *Guidelines for a just transition to environmentally sustainable economies and societies for all,*[32] previously validated by a Tripartite Meeting of Expert. These Guidelines offer a framework and practical tools to ensure a just transition for all, with specific measures in nine macroeconomic, employment and social protection policy areas. The foreseen ILO's Green Initiative of the Director-General will be an important vehicle to give practical effect to the implementation of these Guidelines.

The role and perspectives of social partners

For the world of work to make a significant contribution to the transition towards greener economies, governments and social partners need to work both individually and jointly, in line with their specific roles and responsibilities.

The main views of employers' and workers organizations can be summarized as follows:

32 Source: http://www.ilo.org/global/topics/green-jobs/news/WCMS_422575/lang--en/index.htm

- From the **employers' perspective**, businesses have a great responsibility because they should lead the process as they are the primary source of innovation and of global deployment of advanced technology, finance, and know-how to address environmental challenges. Governments should not lead a transition towards greener economies, but provide the policy and regulatory framework for promoting sustainable enterprise development and private and public investment along with innovation that reinforces environmentally sustainable development. Regarding the ILO's discussion on the definition of green jobs, employers remain sceptical of the assumption that certain jobs are green while others are not. All jobs impact on the environment to different degrees. The objective should therefore be to improve the environmental efficiency of all jobs rather than trying to classify them as green or brown. Similarly, in the case of business and the economy, greening should be considered as a continuous process rather than an outcome in itself. All businesses should make their operation "greener" to be sustainable and survive in the future. The environmental efficiency of the entire economy should be improved while avoiding trade restrictions, barriers and other impediments to competitiveness. Additionally, when considering the growth of businesses and jobs as a response to environmental challenges, employers believe that:
  - It is not possible to consider environmental issues in isolation from economic and social issues. Sustainability requires an overarching approach in which environmental protection, employment growth and economic development go hand in hand.
  - Governments must develop and implement responsible policies that reduce greenhouse gas emissions while ensuring economic development, healthy businesses and the confidence of stakeholders.
  - Changes resulting from climate change are unique because they affect every aspect of business. In terms of labour and management, climate change can therefore not be added as a "condition" to existing labour agreements.
  - Employability skills, trades and professions will be affected by climate change. Some occupations will become redundant while certain skill sets are already changing. Governments and enterprises must therefore commit the time and funds to meet the skill demands of the new labour market.[33]

- Throughout this ongoing process the **workers' representatives** have shaped and promoted the concept of just transition, a framework for a fair and sustainable shift to a low-carbon economy, proposed by trade unions and supported by environmental NGOs. While maintaining that a shift to a lower-carbon economy is vital to avoid the dangerous impacts of climate change and environmental degradation on societies, the *just transition* principle seeks to protect work in those economic sectors that are more likely to be affected by significant employment

33 Source: http://www.ioe-emp.org/fileadmin/ioe_documents/publications/Policy%20Areas/environment_and_climate_change/EN/(2009-06)%20Climate%20Change%20IOE%20Paper.pdf

shifts (energy supply, industry and transport in particular). As part of the negotiations held in Durban in December 2011, the ITUC called for a UNFCCC decision to request the ILO's assistance as the specialized UN agency on labour issues, which would require the organization to report periodically on progress made by countries in ensuring *just transition* and provide recommendations to the UNFCCC on how better to reflect *just transition* components in its decisions. Some of the key recommendations included:

- integrating the environmental and social dimensions of sustainable development into a rights-based approach;
- introducing policies on just employment transition as a central feature of environmental protection; and
- ensuring that workers negatively affected by changes are provided with safe and decent employment alternatives.

Employers' views on the concept of just transition

According to the Employers' group, "just transition is not well defined and contains value-laden language. The world has always gone through transitions. Some have been made less well off as a result of transition, some helped but that is the nature of transition. We have heard no reason why transitions to a greener economy need to be any more or less 'just' than any other transition at work place level. One would hope that all transitions are handled well and with proper consideration of the positions and needs of the workplace actors. And transitions apply to all actors in the equation – including notably – employers. Of course workers and employers share many of the objectives from the changes that the worker faces – that is, to minimize disruption and to maintain and hopefully improve sustainable enterprises, jobs and economies. The right kind of transitions for employers will also mean that labour markets and other transitions elements must be flexible enough to allow for employers to make those transitions without unnecessarily destroying their capital and their capacity to employ workers."

Phil O 'Reilly, Employer Spokesperson, ILO Governing Body 212th Session, Geneva, November 2011.

Key learning points

1.1. The evolving position of business in the sustainable development debate

- The concept of sustainable development – which can be defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs – has its roots in the environmental concerns which grew among OECD countries in the late 1960s.
- Since then many international initiatives have taken place to address these concerns. In this context, the Bruntdland Report (1987) was published, thus marking the beginning of the era of sustainable development and leading to the United Nations Conference on Environment and Development, held in 1992 in Rio de Janeiro.
- Also called the Earth Summit, the 1992 Conference was the first step in a focus on sustainable development by the business sector. The World Business Council for Sustainable Development (WBCSD) was created to coordinate the business sector's participation in the summit.
- Ten years later, in 2002, the World Summit on Sustainable Development (WSSD) took place and some concepts for the business sector acquired relevance, in particular the Public-Private Partnership to address sustainability issues, the CSR, and the ISO 26000 which highlighted the importance of social responsibility in doing business.
- In 2012 the United Nations Conference on Sustainable Development (UNCSD), also referred to as the Rio+20 Summit, took place in Brazil. The focus was on green economy in the context of sustainable development and poverty eradication, and the institutional framework for sustainable development.
- The business community made itself more visible than ever in the preparation and implementation of the Rio+20 Summit. Notably, the WBCSD established its Vision 2050, setting out what business thinks a sustainable world would look like in 2050. Moreover the Business Action for Sustainable Development (BASD 2012) organized the Business Day at Rio+20, a temporary coalition of the foremost business leaders and organizations committed to sustainable development.
- For business, a major outcome from the Summit was the recognition that business needs to be part of the policy development process because enterprises are the main sources of delivering action and providing solutions in this complex transition.
- The UN Conference on Sustainable Development (Rio+20) established an intergovernmental working group to design Sustainable Development Goals (SDGs) as successors to the MDGs.

- At the United Nations Sustainable Development Summit on 25th September 2015, world leaders adopted the 2030 Agenda for Sustainable Development. This agenda is composed of 17 Sustainable Development Goals (SDGs), which includes special targets for each goal, to end poverty, fight inequality and injustice, and tackle climate change by 2030.
- The new development agenda will affect the way in which businesses develop and behave. Consequently, sustainable development must be a core issue for business strategy.

1.2 Understanding the green economy and its impact for the world of work

The ILO's involvement in the sustainable development debate

- Starting from the 1970s, the ILO linked sustainable development to its mandate for advancing social justice through the promotion of decent work.
- For the 1992 Earth Summit, the ILO prepared an *ILO Agenda 21* in support of the negotiations and to place world-of-work priority issues within the final text of the global Agenda 21 as well as references to employment matters in the Rio Declaration.
- Since then, the ILO has actively participated in a number of summits and conferences, signed relevant agreements and organized many programmes on sustainable development.
- Most recently at Rio+20, the ILO contributed three key priorities to the Conference's outcome document: (i) generating employment and eradicating poverty through sustainable enterprises and green jobs, (ii) ensuring a just transition to a green economy, and (iii) ensuring tripartite participation in sustainable development policy formulation and implementation.
- ILO constituents have raised their voices in the international debates on climate change. The workers' representatives have shaped and promoted the concept of just transition, a framework for a fair and sustainable shift to a low-carbon economy, proposed by trades unions and supported by environmental NGOs. Employers' representatives call for measures that tackle climate change while ensuring economic development and healthy business development. The right kind of transitions for employers will mean that labour markets are flexible enough to allow for employers to build their capital and their capacity to employ workers.
- The ILO has engaged in a partnership with UNEP, the IOE and ITUC on the Green Jobs Initiative to assess, analyze and promote the creation of decent jobs in the context of policies needed to address the global environmental challenges.
- A global Green Jobs Programme of the ILO was created in order to foster the creation of green jobs worldwide by increasing research and advocacy, offering policy and technical advisory services as well as training and knowledge sharing.

- The Conclusions of the 102nd Session of the International Labour Conference (2013) which had "sustainable development, decent work and green jobs" on its agenda (i) set out a common vision for achieving decent work, green jobs and sustainable development, (ii) underscore the critical role of governments, employers and workers as agents of change, and (iii) provide guiding principles on the greening of economies, enterprises and jobs. This includes building a strong social consensus on (i) the goal of and pathways to sustainability, (ii) the important role of social dialogue, and (iii) respect for and promotion and realization of fundamental principles and rights at work.

The international green agenda: concepts and definitions

Green economy

- Initially limited to reduction of carbon emissions due to their impact on climate change, the green economy concept has rapidly expanded to respond to all environmental challenges and go beyond the creation of environmental goods, services and jobs, to include the broader dimensions of energy and resource efficiency, poverty eradication, social equity and human-well-being.
- From a business perspective, the "greening the economy" approach seems widely accepted as it puts emphasis on making investments in technologies, systems and infrastructures that enhance productive economic activities while optimizing natural resource utilization and minimizing environmental impacts.

Green growth

- Since its first appearance in 2005, the concept of green growth has been adopted by many international organizations using different definitions, two of which appear most relevant.
- According to the OECD, green growth means "fostering economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies".
- According to the World Bank, green growth is "efficient in its use of natural resources, clean in that it minimizes pollution and environmental impacts, and resilient in that it accounts for natural hazards and the role of environmental management and natural capital in preventing physical disasters".

Green jobs

- There is at present no consensus on the definition of green jobs. The ILO and UNEP offer a broad definition which comprises employment in green sectors as well as green occupations in all sectors. It includes employment in parts of economic activities that may not produce green product and services but which operate in an environmentally friendly manner.

- More specifically, for the ILO green jobs are decent jobs that: improve efficiency of use of energy and raw materials, limit greenhouse gas emissions, minimize waste and pollution, protect and restore ecosystems, and support adaptation to the effects of climate change. At the enterprise level, green jobs can produce goods or provide services that benefit the environment. Therefore green jobs can also be distinguished by their contribution to more environmentally friendly enterprise production processes. Moreover, green jobs can also be distinguished by jobs that directly contribute to natural resource conservation by protecting or enhancing environmental quality.
- Employers remain sceptical of the assumption that some jobs are green while others are not. Similarly, the term green economy suggests there are two economies – one green and one normal. Greening should be considered as a continuous process rather than an outcome in itself. The entire economy, and all jobs and businesses need to move toward greening. The real challenge for the greening of jobs and for greening growth will be to ensure that as many actors in the economy as possible understand what it means for them and that it empowers them to take action.

The greening of the ILO agenda

- The ILO has a long-standing involvement with sustainable development in relation to its mandate for advancing social justice through promotion of decent work. Many of the ILO instruments adopted over the past 40 years refer to or have an impact on the working environment and its connection with the external environment as a whole.
- In 2007, the ILO engaged in a partnership with UNEP, the International Organization of Employers (IOE), and the International Trade Union Confederation (ITUC) known as the Green Jobs Initiative.
- Subsequently, the global Green Jobs Programme of the ILO was created in 2009 under the guidance of the International Labour Conference and the Governing Body to promote creation of green jobs worldwide.
- At the 102nd Session of the International Labour Conference, the ILO Constituents set out a common vision for achieving "Decent Work, Green Jobs and Sustainable Development", underscoring the critical role of governments, employers and workers as agents of change, both individually and collectively.
- In 2015, the Governing Body authorized the publication of "Guidelines for a Just Transition" reviewed and adopted by a tripartite expert meeting. The Guidelines will be used as a basis for activities and outreach in the Office work and strategic planning and they will be taken into consideration within the context of the 2030 Agenda for Sustainable Development and the implications of the Climate Agreement (December 2015) for the world of work.

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Section 2

Understanding the main environmental challenges and their implications for business

2.1 Global environmental challenges

"*Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history.***"**[1]

Environmental degradation has expanded from a local to a global scale. As a result, the gap between our current level of consumption and the level which the global environment can sustain continues to grow. We are approaching – and in some cases surpassing – the limits of our planet's resources and carrying capacity. Scientific experts warn that many of these impacts may become permanent in human timescales if action to alleviate the pressures is not taken promptly. Not only is the situation environmentally unsustainable, but it also presents substantial economic and social costs.

In order to understand the different implications for business of a change in the environmental quality and present possible responses, it is important to first introduce the inter-linkages between the different environmental challenges and their connection with human-well-being.

The magnitude of environmental problems and their costs for society

The first key reference in understanding the environmental challenges of our time is the **Millennium Ecosystem Assessment (MA)**[2] that was carried out between 2001 and 2005 "to assess the consequences of ecosystem change for human well-being and to establish the scientific basis for actions needed to enhance the conservation and sustainable use of ecosystems and their contributions to human well-being."

An ecosystem is "a dynamic complex of plant, animal, and microorganism communities and the non-living environment interacting as a functional unit." The MA covers the full range of ecosystems – from those relatively undisturbed, such as natural forests, to landscapes with mixed patterns of human use, to ecosystems intensively managed and modified by humans, such as agricultural land and urban areas.

Ecosystems provide a multitude of resources and processes for humans. Collectively these benefits are known as ecosystem services[3] and encompass products such as clean drinking water and timber as well as processes including decomposition of wastes and climate regulation.

1 Millennium Ecosystem Assessment (Programme), *Millennium Ecosystem Assessment Synthesis Report* (2005).
2 Source: Initiated in 2001, the objective of the MA was to assess the consequences of ecosystem change for human well-being and the scientific basis for actions needed to enhance the conservation and sustainable use of those systems and their contribution to human well-being. More information at: http://www.millenniumassessment.org
3 The Millennium Ecosystem Assessment Report 2005 defines ecosystem services as benefits people obtain from ecosystems.

Grouped in four different categories, they include:

- **provisioning services** such as food, water, timber, and fiber;
- **regulating services** that affect climate, floods, disease, wastes, and water quality;
- **cultural services** that provide recreational, aesthetic, and spiritual benefits; and
- **supporting services** such as soil formation, photosynthesis, and nutrient cycling.

The human species, while buffered against environmental changes by culture and technology, is fundamentally dependent on the flow of ecosystem services. The same is true for business.

According to the findings of the Millennium Ecosystem Assessment, three major problems associated with management of the world's ecosystems are already causing significant harm to societies.

Finding #1

"Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber, and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on earth."

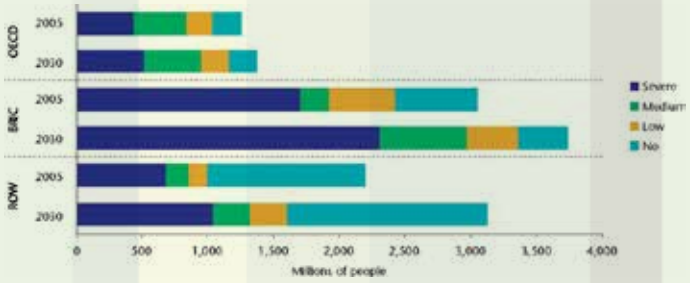
Source: http://www.millenniumassessment.org

The figure below provides an example of Finding #1 through an indication of the level of water stress in different countries. Water stress is one of the consequences of ecosystem degradation. It is a measure of the dependence of humans on accessible freshwater resources.

Water stress occurs "when the demand for water exceeds the available amount during a certain period or when poor quality restricts its use. Water stress causes deterioration of fresh water resources in terms of quantity (aquifer over-exploitation, dry rivers, etc.) and quality (eutrophication, organic matter pollution, saline intrusion, etc.)."[4] With anticipated population growth, economic development and urbanization, competition for water resources is likely to become much more intense.

4 Source: European Environment Agency, http://www.eea.europa.eu/themes/water/wise-helpcentre/glossary-definitions

People living in areas of water stress by level of stress (OECD, BRIC countries and Rest of the World)



Source: OECD, *Environmental Outlook to 2030* (Paris: OECD Publishing, 2008)

Finding #2

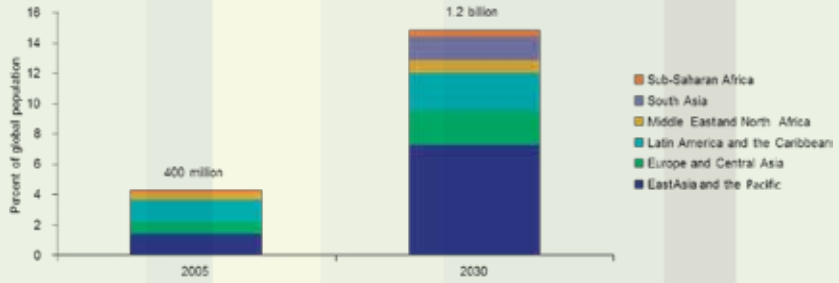
"The changes that have been made to ecosystems have contributed to substantial net gains in human well-being and economic development, but these gains have been achieved at growing costs in the form of the degradation of many ecosystem services, increased risks of nonlinear changes, and the exacerbation of poverty for some groups of people. These problems, unless addressed, will substantially diminish the benefits that future generations obtain from ecosystems."

Source: http://www.millenniumassessment.org

As illustrated in the figure below, as a result of economic development and a foreseen increase in the global population, approximately 800 million people are expected to move from low to middle class. This will change the current consumption patterns, especially in developing countries. More concretely, by 2030 3 billion more middle-class consumers are expected in the global economy. This will result for instance in increased demand for meat consumption *per capita*, cars and other manufactured goods and technologies.[5]

5 Heck et al., *Resource Revolution: How to Capture the Biggest Business Opportunity in a Century* (McKinsey Global Institute 2011).

Population in low- and middle-income countries earning US$ 4,000-17,000 per capita



Source: World Bank, *Global Economic Prospects* (Washington 2007)

The effect of socio-economic needs coupled with a rising population will further degrade the environment and exert pressure on natural resources. For example:

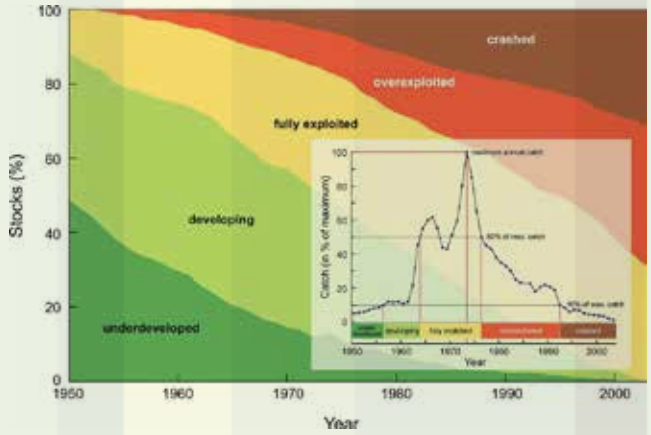
- Escalating use of primary raw materials (for example construction minerals, ores and industrial minerals, fossil fuels and biomass) is leading to a tripling of global annual resource extraction by 2050. As a result energy and commodity prices will increase to counterbalance limited resources with soaring demand, causing adverse consequences in terms of contracted production and job losses.
- Steel is another resource in increasingly high demand. Given steel's importance to the global economy and its linkages with other resources, it can be used as a proxy for materials overall. The demand for steel is expected to increase by about 80 per cent from 1,270 million tonnes in 2010 to 2,290 million tonnes in 2030, driven primarily by increasing demand from China, India, and other emerging markets (ECORYS 2012, 18). Production and consumption of most metals has increased during the past ten years, including iron ore, copper, aluminium, cobalt and rare earths.

Finding #3

"The degradation of ecosystem services could grow significantly worse during the first half of this century and is a barrier to achieving the Millennium Development Goals."

Source: http://www.millenniumassessment.org

Time series of the composition of global marine fisheries catch according to the status of the stocks making up that catch



Source: Daniel Pauly, *The Sea Around Us Project, Documenting and Communicating Global Fisheries Impacts on Marine Ecosystems*, AMBIO: A Journal of the Human Environment (2007)

Over the last forty years eighty per cent of fish stocks have been overused,[6] endangering the natural reproduction of fish in our seas (see figure above). Considering that millions of people rely on fish as their main source of nourishment and for their livelihood, the collapse of fish stocks not only poses a major environmental challenge in terms of endangering marine ecosystems, but also a socio-economic challenge, especially for countries struggling against hunger, malnutrition and poverty.

The challenge of reversing the degradation of ecosystems while meeting increasing demands for their services implies significant changes in current policies, institutions, and practices.

Understanding our planetary boundaries

Another important reference for understanding the substantial changes taking place in the global environment are the reports by the **Global Footprint Network**[7]

6 Rashid M.Hassan et al.,*Ecosystems and Human Well-Being: Current State and Trends, Volume 1: Findings of the Condition and Trends Working Group of the Millennium Ecosystem Assessment* (Washington, DC: Island Press, 2005).
7 See: www.footprintnetwork.org

indicating that, today, humanity is using the equivalent of one-and-a-half planets to provide the resources we use and to absorb the waste we generate.

As a result of a "business-as-usual" attitude, the world is also experiencing an "ecological overshoot". This overshoot has continued to grow over the years, reaching a fifty per cent deficit in 2008. It now takes one and a half years for the earth to regenerate the renewable resources that we use and to absorb the CO_2 waste they produce in that same year. While some progress has been made towards achieving sustainable development in the past two decades, environmental challenges persist.

Planetary boundaries

In 2009 a group of 28 internationally renowned scientists identified and quantified a set of **nine planetary boundaries** within which humanity can continue to develop and thrive for generations to come. Crossing these boundaries could generate abrupt or irreversible environmental changes. Respecting the boundaries reduces the risks to human society of crossing these thresholds.

Source: http://www.stockholmresilience.org/21/research/research-programmes/planetary-boundaries.html

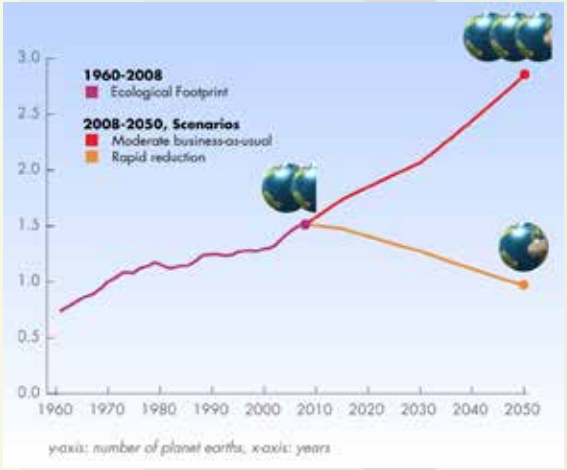
From the perspective of business "in recent years, increasing numbers of companies – including large and small, private and state owned – have come to understand that there are both commercial and ethical imperatives in relation to the global sustainable development agenda". One of these imperatives relates to "natural resource constraints and environmental degradation". Reports from the business community acknowledge that "business cannot possibly prosper over the long run in a world of ever-increasing pressures on natural resources and the environment, which enterprises rely on to sustain production and operations. Development needs to take place within the **planetary boundaries** of natural, ecological systems."[8]

As the earth's natural processes transform local problems into international issues, few societies are being left untouched by major environmental problems. Challenges such as rapid urbanization, pervasive poverty, unsustainable consumption and production patterns, as well as population growth often serve to compound the effects and intensity of environmental problems.

8 Joint report to the High-Level Panel of the Post-2015 UN Development Agenda, prepared by the UN Global Compact and the World Business Council For Sustainable Development, with the support of the World Economic Forum and the High-Level Panel's Business Representatives (March 2013).

"Moderate UN scenarios suggest that if current population and consumption trends continue, by the 2030s, we will need the equivalent of two Earths to support us. […] Turning resources into waste faster than waste can be turned back into resources puts us in global ecological overshoot, depleting the very resources on which human life and biodiversity depend. […] August 19 is Earth Overshoot Day 2014, marking the date when humanity has exhausted nature's budget for the year. For the rest of the year, we will maintain our ecological deficit by drawing down local resource stocks and accumulating carbon dioxide in the atmosphere. We will be operating in overshoot."

The World Footprint



Source: http://www.footprintnetwork.org/

Every environmental problem has numerous causes and effects while being connected at the same time to other related environmental challenges. Consequently the environmental problems affecting our societies are numerous and complex.

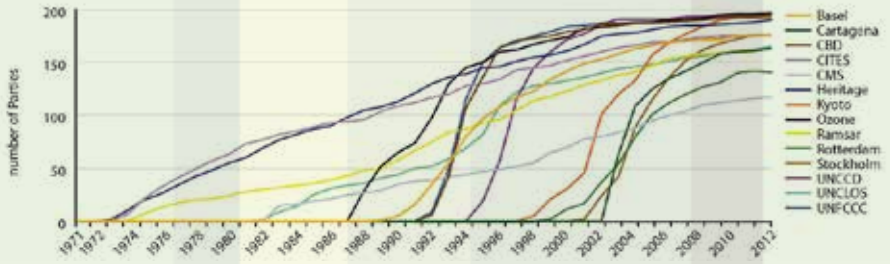
In order to present these problems concisely, **six major global environmental challenges** have been postulated in this section, namely:

- Air pollution
- Energy
- Biodiversity
- Land use and soil degradation
- Water
- Waste, hazardous substances and chemicals

These challenges will be presented in turn and, where applicable, the most relevant international Conventions will be discussed.

As noted in Section 1, many of these Conventions are Multilateral Environmental Agreements (MEAs). According to the UNEP Year Book 2013 "Emerging Issues in our Global Environment", as the number of MEAs has grown, so has the number of countries (Parties) which are signatories (see Annex 1 for updated information on the status of MEAs).

Number of Parties to Multilateral Environmental Agreements (MEAs), 1971-2012.



Source: UNEP YearBook 2013, Key environmental indicators

The figure above shows that 90 per cent of United Nations Member States were signatories to the complete set of 14 major MEAs in 2012. "Establishing and signing such agreements is a first important step, but it does not mean the environmental problems addressed will be solved right away."[9]

United Nations Information Portal on Multilateral Environmental Agreements

The MEA Information and Knowledge Management (IKM) Initiative brings together Multilateral Environmental Agreements (MEA) to develop harmonized and inter-operable information systems for the benefit of Parties and the environment community at large. The Initiative is facilitated by the United Nations Environment Programme.

InforMEA is the first project established by this Initiative. InforMEA amasses COP decisions and resolutions, news, events, MEA membership, national focal points, national reports and implementation plans from MEA secretariats, and organizes this information around a set of agreed terms.

For more information, see: http://www.informea.org/

9 Source: www.unep.org/yearbook/2013/pdf/Environmental_indicators.pdf -

2.1.1 Air Pollution

Stratospheric ozone layer depletion

The ozone in the stratosphere – the atmosphere's upper layer – protects humans, animals and plants from the damaging effects of UV-B radiation from the sun. Without it, all life on earth would cease to exist. Ozone depletion is a phenomenon observed since the late 1970s. "The appearance of the Antarctic ozone hole was proof that increased concentrations of anthropogenic ozone-depleting chemical substances, interacting with polar stratospheric clouds, had passed a threshold and moved the Antarctic stratosphere into a new regime."[10] The use of chlorofluorocarbons (CFCs) and other ozone-depleting substances (ODS) is slowly eroding the stratospheric ozone layer, creating a major potential health hazard.

International framework

The international community took decisive action to protect the ozone layer with the adoption in 1985 of the **Vienna Convention for the Protection of the Ozone Layer**, a MEA that came into force in 1988. The **Montreal Protocol** (adopted in 1987) phased out the production of numerous substances believed to be responsible for ozone depletion (such as CFCs, halons, carbon tetrachloride, and methyl chloroform). The protocol came into force on 1 January 1989. These measures have been remarkably successful; it is currently estimated that CFC concentration in the ozone layer is expected to return to pre-1980 levels by the year 2050.

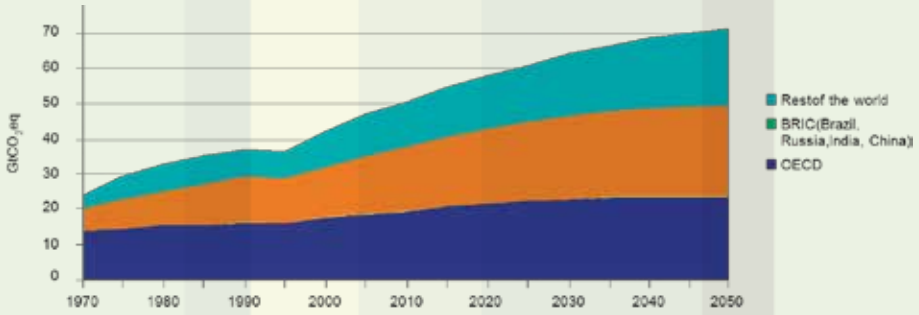
Climate change

It is now widely recognized that global warming over the past 50 years is largely due to human activities and the burning of fossil fuels which have released greenhouse gases (GHG) into the atmosphere. As presented in the figure below, Greenhouse Gas (GHG) emissions are projected to grow by a further 52 per cent up until 2050, resulting in an increase in global average temperatures in the range of 1.7–2.4°C.

Recent evidence suggests that the earth has already transgressed the planetary boundary and is approaching several earth system thresholds, with the CO_2 in the atmosphere now exceeding 387 parts per million by volume (ppmv). "This is one example of a well-defined threshold above which rapid physical feedback mechanisms can drive the earth system into a much warmer state with sea levels metres higher than present. The weakening or reversal of terrestrial carbon sinks, for example through the ongoing destruction of the world's rainforests, is another potential tipping point, where climate-carbon cycle feedbacks accelerate

10 Source: http://www.stockholmresilience.org/21/research/research-programmes/planetary-boundaries/planetary-boundaries/about-the-research/the-nine-planetary-boundaries.html

GHG emissions by regions



Source: OECD, *Environmental Outlook to 2030*, (Paris: OECD Publishing 2008)

earth's warming and intensify the climate impacts. A major question is how long we can remain over this boundary before large, irreversible changes become unavoidable."[11]

See Annex 2 for the definition of a number of climate change related terms.

International framework

As seen in Section 1, the **United Nations Framework Convention on Climate Change (1992)** sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. The Convention came into force on 21 March 1994. The **Kyoto Protocol** is the international treaty that sets binding obligations on developed countries to reduce GHG emissions. The Protocol was adopted by Parties to the UNFCCC in 1997, and came into force in 2005. Its first commitment period covered the years 1997-2012. The second commitment period, started on 1 January 2013 and runs until 2020.

In the Rio+20 outcome document, the participating countries affirmed that climate change is one of the greatest challenges of our time. They expressed alarm over the fact that emissions of GHG continue to rise globally – adding that they were "deeply concerned that all countries, particularly developing countries, are vulnerable to the adverse impacts of climate change, and are already experiencing increased impacts including persistent drought and extreme weather events, sea

11 Stockholm Resilience Centre: http://www.stockholmresilience.org/21/research/research-programmes/planetary-boundaries/planetary-boundaries/about-the-research/the-nine-planetary-boundaries.html

level rise, coastal erosion and ocean acidification, further threatening food security and efforts to eradicate poverty and achieve sustainable development", as stated in paragraph 190 of The Future We Want.

The United Nations Climate Change Conference held in Doha, Qatar (2012), focused on ensuring implementation of agreements reached at previous conferences. The "Doha Climate Gateway" package included amendments to the Kyoto Protocol to establish its second commitment period.[12] In addition, governments agreed to work toward a universal climate change agreement, to be adopted by 2015, with the objective of scaling up efforts to keep the level of global warming below 2°C, as compared to the temperature in pre-industrial times, by 2020. To stay within this ceiling, the scientific evidence shows that the world must stop the growth in global greenhouse gas emissions by 2020 at the latest, reduce them by at least half of 1990 levels by the middle of this century and continue cutting them thereafter."[13]

At the UN Climate Change Conference in Warsaw (2013), governments took further essential decisions to stay on track towards securing a Universal Climate Change Agreement. During the COP20, held in Lima in December 2014, Governments agreed the ground rules on how all countries can submit contributions to the new agreement set to be achieved at the COP21 in Paris. The so-called Intended Nationally Determined Contributions (INDCs) formed the foundation for climate action post 2020, when the new agreement is set to come into effect. Significant progresses were made in elevating adaptation onto the same level as action to cut and curb emissions.

The **Paris Agreement** was adopted at the COP21 by consensus of the 192 countries that are Parties to the UNFCCC. The objective is to collectively guide nations into an effective global effort to reduce emissions in order to chart humanity's longer-term path out of the danger zone of climate change, while building adaptation capacity. The overarching goal is to reduce greenhouse gas emissions in order to limit the global temperature increase to 2°C above pre-industrial levels, while pursuing the more ambitious 1.5°C target.

Despite the progress made towards definition of a legally binding global climate agreement since 2007, the results achieved and "action agreed to date are not sufficient to reduce global emissions to a level that can meet the goal of holding global warming below 2°C compared with the pre-industrial temperature".[14]

2.1.2 Energy

Access to energy

Addressing the lack of access to clean, reliable and affordable energy services for

12 Governments decided on an 8-year second commitment period, which started on January 1st 2013.
13 European Commission, "What is the EU doing about climate change?" http://ec.europa.eu/clima/policies/brief/eu/index_en.htm
14 http://ec.europa.eu/clima/policies/international/negotiations/progress/index_en.htm

billions of people is one of the world's most critical development challenges and is becoming increasingly prominent on the international agenda.[15] Lack of access to energy is a major barrier to economic and social progress.[16]

Worldwide, approximately 2.7 billion people rely on traditional biomass for cooking and heating and about 1.3 billion lack access to electricity, with up to a billion more having access only to unreliable electricity networks. The 'energy-poor' suffer significant economic disadvantages from inadequate power for productive income-generating activities and receive essential social services of reduced quality, energy being critical for providing effective education and healthcare.

The UN has recommended that the international community adopts a global development goal of universal energy access by 2030. Greater access to energy combined with the population growth that will mainly occur in non-OECD countries will have a dramatic impact on the global energy landscape.

In its 2011 World Energy Outlook the International Energy Agency (IEA) estimated that, to achieve the MDGs, an additional 395 million people need to be provided with electricity and an additional 1 billion provided with access to clean cooking facilities by 2015. More recently, IEA has estimated that in the period from now to 2035 non-OECD countries will account for 90 per cent of population growth and 90 per cent of growth in energy demand. It has also predicted that China, India, Indonesia, Brazil, and the Middle East will have the highest rates of growth in energy consumption. In the recently released 2014 World Energy Outlook, IEA confirms that electricity remains inaccessible to many people, including two out of every three people in sub-Saharan Africa.

The large, energy-consuming OECD economies also represent considerable market potential despite the slower growth in their energy use. This is particularly true in sectors in which asset lifetimes are shorter (for example household appliances) or in which a significant amount of equipment is nearing the end of its lifetime, as is currently the case in the power sector and with buildings.

Energy efficiency

There are various motivations for improving energy efficiency in all economic sectors (on both supply and demand sides). One is a reduction of emissions. Energy efficiency is widely accepted as the most cost-effective way of mitigating climate change and accounts for 50 per cent of the potential to halve energy-related CO_2 emissions by 2050.[17]

Energy security is another key motivation, for in many countries energy efficiency

15 See for example http://www.wbcsd.org/accesstoenergy.aspx
16 For example, the World Bank estimates that poor access to energy and related load-shedding cost African economies 2.1 per cent of GDP on average. http://go.worldbank.org/8VI6E7MRU0
17 IEA and OECD, *Energy Technology Perspectives 2008: Scenarios & Strategies to 2050: in Support of the G8 Plan of Action* (Paris: OECD/IEA, 2008).

is also seen to have a national security benefit as it can be used to reduce the level of energy imports from abroad and may also slow down the rate at which domestic energy resources are depleted.

Energy efficiency can generate positive returns on investment and has the potential to promote high value-added activities and job creation. The deployment of energy-efficient technologies can alleviate energy supply shortages, contribute to reducing energy investment costs and address the competitive disadvantage effect caused by high prices for natural gas and electricity in import-dependent regions.[18]

There are however a number of barriers to energy efficiency in terms of implementation which policies should address (see Annex 3).

Energy Mix

CO_2 emissions from the energy system have become a major issue. The latest report by the Intergovernmental Panel on Climate Change (IPCC) reaffirms that the energy sector is the largest contributor to global GHG emissions.[19]

The use of fossil fuels gives rise to several pollutants that worsen ambient air quality and have a negative impact on human health. Two of the most important of these pollutants are sulphur dioxide (SO_2) and nitrogen oxides (NO_x), SO_2 emanating mainly from burning coal but also diesel fuel, while NO_x emanates from the burning of all types of fossil fuel. They cause a number of environmental problems such as acid rain and ground-level ozone formation.

Today renewable energy provides 13 per cent of the global energy mix (2 per cent hydroelectric, 10 per cent biomass and waste, 1 per cent wind/solar etc.) and 19 per cent of the power mix. Substantial changes in the global energy system will be required to meet the expected increase in demand (30-50 per cent more in 2035-2050 than in 2010 depending on the extent of energy efficiency improvements) while also reducing global greenhouse gas emissions to one-half of the 2005 levels.[20]

A clear, unambiguous and well-structured energy policy framework is required in all countries to alter the energy mix and deliver emission reductions faster than historical energy trends would otherwise suggest. Although governments are attempting to introduce such a change, it is occurring slowly at a global level and efforts are often fragmented and short-lived. While the technologies to reduce emissions are well known and business is technically able to deploy them, commercial viability remains an obstacle in many instances.

18 OECD/IEA: *World Energy Outlook 2014* (Paris, 2014).
19 Source: https://www.ipcc.ch/report/ar5/wg3/
20 For more information, see: http://energyinnovation.org/wp-content/uploads/2012/05/WBCSD-The-Energy-Mix.pdf

Renewable energy

Heat produced from renewable sources (such as wood pellets or solar heat boilers) would reduce CO_2 emissions by 150 million tonnes in 2035 by displacing heat from boilers using coal, oil or gas. Biofuels would reduce emissions from oil in the transport sector by an estimated 0.4 Gt in 2035, but only as long as their production does not result in increases in emissions from direct or indirect land-use changes. This aspect of biofuels has come under close scrutiny in recent years. Sugarcane ethanol and advanced biofuels have the highest potential for reducing emissions. They have however also been criticized for competing with food supply and contributing to deforestation, but such negative impacts of biofuels can be minimized or avoided if the right policies are established and enforced.

Renewable energy is largely a domestic energy source (although a proportion of biofuels and other bioenergy is traded internationally). When it displaces imported fuels it contributes to greater national energy security and directly reduces import bills, which represent a fairly significant percentage of GDP for many importing countries and often contribute to a trade deficit. Biofuels have the potential to reduce these effects significantly. Furthermore, greater use of renewables could indirectly put downward pressure on oil and gas prices and reduce price volatility. In the electricity sector, renewables mainly reduce the need to import gas or coal, as oil use is limited in this sector.

A number of problems arise from the expanding use of renewables, including the volatility of renewable energy generation, especially from wind and solar power sources. Because of this volatility, back-up capacity using fossil fuels is needed. However the limited number of operating hours of this back-up capacity makes it extremely difficult to make such plants profitable, yet a lack of sufficient back-up capacity could make energy systems dangerously vulnerable. Fossil-fired generation will therefore remain an indispensable part of a well-balanced and diverse supply of power resources.

With a higher share of renewables, electrical energy systems require new high-voltage transmission capacity. “Smart grid” solutions also need to be developed to manage the issues of high variability and intermittence. Policy-makers and the electrical utility industry need to work together to promote the important investments required to accomplish these goals.

Another problem with renewable energy developments is that they are largely based on specific government incentives, which are valuable and necessary. However policy-makers must be transparent with the public about the subsidies used to expand renewable energy and the higher costs which can be associated with them. The industry needs governments to streamline processes and support for the siting and construction of the necessary transmission facilities to use these resources, as well as securing the recovery of additional investments and costs from all stakeholders.

Nuclear power

Nuclear power is a potential source of low-cost clean energy. For many economies it is a key to addressing both energy security and climate change challenges.

Nuclear power has however been controversial for decades, linked to the specific combination of economic, technical and political challenges that need to be overcome. To promote the use of nuclear power policy-makers and the electricity supply industry need to strive to enhance public understanding of the benefits of nuclear power including supply stability, economic efficiency and a lack of CO_2 emissions. While Civil Society seems to be against nuclear power, it has higher expectations of renewable energy. Ensuring the safety of this source of energy is however paramount, particularly in light of nuclear accidents in the past.

Focus on this topic was renewed in 2011 following the Fukushima nuclear accidents in Japan, as shown in the following example. According to IEA's recent projections "of the growth in nuclear generation to 2040, China accounts for 45% while India, Korea and Russia collectively make up a further 30%. Generation increases by 16% in the United States, rebounds in Japan (although not to the levels prior to the accident at Fukushima Daiichi) and falls by 10% in the European Union."[21]

Germany's Nuclear Phasing Out

Following the 2011 Fukushima nuclear accident in Japan, the mood in Germany swung against nuclear power[22] and the country decided to shut all nuclear reactors by 2022.

As a consequence of numerous demonstrations, the German government announced a plan to shut down all power stations put into operation prior to the end of 1980. In addition it was declared that all of Germany's nuclear power stations would undergo new safety tests.

Prior to this decision 17 per cent of the country's electricity came from the renewable energy sector and 23 per cent from nuclear power stations. Critics to the phase-out have warned that Germany could face blackouts although no evidence of this has yet been seen.

21 OECD/IEA: *World Energy Outlook 2014* (Paris, 2014).
22 For more information see: Caroline Jorant, "The implications of Fukushima: The European perspective." *Bulletin of the Atomic Scientists 67*, no. 4 (2011): 14. http://www.dw.de/merkel-shuts-down-seven-nuclear-reactors/a-14912184-1

2.1.3 Biodiversity

The term biodiversity refers to the biological diversity of life on earth. The number of species of plants, animals, and microorganisms, the enormous diversity of genes in these species, and the different ecosystems on the planet such as deserts, rainforests and coral reefs, are together all part of a biologically diverse planet.

Both plant and animal species have been disappearing at 50-100 times the natural rate, owing to factors such as large-scale clearance and burning of forests, over-harvesting of plants and animals, indiscriminate use of pesticides, draining and filling of wetlands, destructive fishing practices, air pollution, and the conversion of wild lands for agricultural and urban uses. It should also be noted that rapid global warming can affect an ecosystem's chances of adapting naturally.

In response, governments and communities worldwide are preoccupied with measures to preserve biodiversity. A whole range of activities, programmes and projects are in place to achieve this goal such as purification of air and water; maintenance of soil fertility; measures to mitigate and adapt to floods and droughts; detoxification and decomposition of wastes; maintenance of concentrations of vital gases and water vapour in the atmosphere; and control of infectious agents in the environment. Appropriate conservation and sustainable development strategies are essential for the success of these measures.

International framework

The **Convention on Biological Diversity (CBD)** was opened for signature at the 1992 UN Conference on Environment and Development and came into force on 29 December 1993. It establishes three main goals:

- conservation of biological diversity;
- sustainable use of its components; and
- fair and equitable sharing of the benefits from use of genetic resources.

During the following two decades a number of steps were taken to establish and consolidate this legal framework:

- In May 2000 the Convention's Cartagena Protocol on Biosafety was presented for signature. The Protocol seeks to protect the planet's species and ecosystems from the potential risks posed by genetically-modified organisms, and to establish an advanced agreement procedure for ensuring that countries are provided with the information necessary to make informed decisions before agreeing to the import of such organisms.
- At the 10th Conference of Parties (COP) to the Convention on Biological Diversity in 2010, the **Nagoya Protocol** was adopted. Its objective is the fair and equitable sharing of benefits from utilization of genetic resources, thereby contributing to conservation and sustainable use of biodiversity.

- Following a recommendation by the CBD signatories on 22 December 2010, the UN declared the period 2011-2020 as the UN Decade on Biodiversity.

Biodiversity issues differ according to the country context. While environmental aspects need to be taken into account, complex social situations also have biodiversity dimensions.

The concept of valuing the ecosystem services of natural resources is widely debated nowadays. This is a particularly sensitive topic for governments (especially in emerging and developing countries) because it pertains to sovereignty over natural resources and trade barriers. Political issues aside, the urgency in terms of the environment as well as the demands and expectations of the public make this topic one of the most important issues which responsible businesses have to take into account.

2.1.4 Land use and soil degradation

The most common forms of unsustainable land use are over-cultivation, overgrazing, deforestation and poor irrigation practices. Land-use change is a key driving force behind severe reductions in biodiversity. Extensive farming, driven by large-scale expansion in some regions and unproductive and inefficient subsistence agriculture in others, has contributed to land degradation and deforestation; forest losses averaged 5.2 million hectares annually between 2000 and 2010, mostly in tropical – and, hence, more intensely biologically diverse – regions (FAO 2010). By 2008 one-quarter of the world's land surface had been degraded as a result of soil erosion, salinization, nutrient depletion, and desertification.[23]

In addition, "while each incident of land-use change occurs on a local scale, the aggregated impacts can have consequences for earth system processes on a global scale. A major challenge with setting a land use boundary is that it needs to reflect not just the absolute quantity of unconverted and converted land but also its function, quality and spatial distribution."[24]

Desertification

Desertification is a significant threat to the arid, semi-arid and dry sub-humid regions of the world, which account for 40 per cent of the planet's land surface. These susceptible regions are particularly vulnerable owing to the fact that they recover very slowly from disturbance and further deteriorate as a result of rain and wind erosion, and of chemical and physical deterioration of the soil structure.

23 Bai et al., *Global Assessment of Land Degradation and Improvement 1: Identification by Remote Sensing* (Rome/Wageningen 2008).
24 Stockholm Resilience Centre: http://www.stockholmresilience.org/21/research/research-programmes/planetary-boundaries/planetary-boundaries/about-the-research/the-nine-planetary-boundaries.html

International framework

These issues are addressed in the **UN Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD)**, which came into force in December 1996. Developed as a result of the 1992 Rio Summit, the UNCCD is a unique instrument which has focused attention on land degradation and drought in one of the most vulnerable ecosystems in the world. Nowadays the UNCCD is increasingly recognized as an instrument which makes an important contribution to the achievement of sustainable development, food security and poverty reduction.

In 2007 the Parties to the Agreement adopted a ten-year strategy to enhance implementation of the Convention as a blueprint for a more effective and efficient process grounded in strong and cutting-edge science. One consequence is that the scientific conferences of UNCCD are academically independent.

In June 2012 world leaders at Rio+20 declared land degradation and drought as two of the most serious global challenges impeding sustainable development in all nations, especially developing countries.

Deforestation

The alarming rates of deforestation and the associated loss of environmental resources and social and cultural traditions – alongside the loss of the economic and productive capacity of forestland – account for the fact that forest preservation is now a major priority on the national, regional and global policy and political agendas.

The major causes of deforestation and forest degradation lie outside the forest sector and include the need to create agricultural land and to harvest fuelwood for food and energy, along with urbanization. The main adverse effect of deforestation is on the ability of soil to absorb and retain water, thus contributing to depletion of groundwater aquifers which supply about one-third of the world's population. Deforestation is also linked to loss of biodiversity as original rain forests host numerous species of fauna and flora. Furthermore, deforestation has a direct impact on climate change scenarios.

International framework

There is currently no comprehensive legally-binding instrument relating to forests, although many existing international treaties contain provisions that aim to regulate certain activities relating to forests. International efforts in this realm were undertaken through the Intergovernmental Panel on Forests (IPF) and its successor, the Intergovernmental Forum on Forests (IFF). In 2000 the international community decided to establish the **United Nations Forum on Forests (UNFF)**

as a new subsidiary body of the United Nations Economic and Social Council (ECOSOC), its main objective being to promote "the management, conservation and sustainable development of all types of forests and to strengthen long-term political commitment to this end".[25]

Following intense negotiations, the Forum adopted the landmark **Non-Legally Binding Instrument on All Types of Forests** on 28 April 2007. The instrument is considered a milestone, as it is the first time Member States have agreed to an international instrument for sustainable forest management. The instrument is expected to have a major impact on international cooperation and national action to reduce deforestation, prevent forest degradation, promote sustainable livelihoods and reduce poverty for forest-dependent peoples.

The functions of forests are covered by a large number of separate international instruments. Some have received much more attention than others, and there is a lack of an integrated legal regime that would view forests in a holistic manner, with due consideration of the full range of goods and services that they provide.

Tools and initiatives undertaken to address deforestation and forest degradation

The UN-REDD Programme is the United Nations collaborative initiative on Reducing Emissions from Deforestation and Forest Degradation (REDD+) in developing countries. The Programme supports national REDD+ readiness efforts in 53 partner countries, spanning Africa, Asia-Pacific and Latin America, in two ways: (i) direct support for the design and implementation of UN-REDD National Programmes; and (ii) complementary support for national REDD+ action through common approaches, analyses, methodologies, tools, data and best practices developed through the UN-REDD Global Programme. By June 2014 total funding for these two streams of support totalled US$195.7 million.

Source and for more information, see: http://www.un-redd.org/AboutUN-REDDProgramme/tabid/102613/Default.aspx

25 Source: http://www.un.org/esa/forests/about.html

2.1.5 Water

Fresh water resource depletion

Our global reserves of drinkable water are in short supply and one human in five lacks access to potable (safe) water. Water is becoming increasingly scarce: by 2050 about half a billion people are likely to be subject to water-stress, increasing the pressure to intervene in water systems. The freshwater cycle is strongly affected by climate change; its boundary is closely linked to that of climate. However human pressure is now the dominant driving force determining the functioning and distribution of global freshwater systems.[26]

The demand for freshwater resources is accelerating, and competition for fresh water is of increasing concern to planners and policy-makers. At present 70 per cent of the world's fresh water withdrawal is attributable to agriculture, 20 per cent to industry and only 10 per cent to municipal consumption. The projected growth of urban populations will increase localized pressure on water resources for urban consumption, while increasing the demand for feed production in distant areas to support urban-linked industrial animal production systems. The demand for water resources has exceeded population growth by a factor of two or more over the last one hundred years.[27]

The rationale for the sustainable development and management of the earth's water resources was clearly articulated in Chapter 18 of Agenda 21, the United Nations Programme of Action from Rio (1992). Several years later in 1999, the United Nation's Millennium Development Goal (MDG) 7 – "Ensure environmental sustainability" – included the target of reducing by half the proportion of people without access to safe drinking water by the year 2015.

Eco-efficiency measures and tools could be the means of business reducing water consumption. "Research has found that eco-efficiency measures pay big dividends in cost-savings."[28] (See Section 3.)

The concept of "water footprint" is another approach and management framework which could be helpful. It refers to a spatially and temporally explicit indicator of direct and indirect water use by consumers and producers. The water footprint of an individual, community, or business is defined as the total volume of freshwater used to produce its goods and services.[29]

26 Stockholm Resilience Centre: http://www.stockholmresilience.org/21/research/research-programmes/planetary-boundaries/planetary-boundaries/about-the-research/the-nine-planetary-boundaries.html
27 Source: http://www.fao.org
28 Markus Lehni, *Eco-Efficiency: Creating More Value with Less Impact* (Conches-Geneva, Switzerland: WBCSD, 2000). http://www.wbcsd.org/web/publications/eco_efficiency_creating_more_value.pdf
29 See http://www.waterfootprint.org

Water pollution

Water pollution is the contamination of water bodies (for example lakes, rivers, oceans, aquifers and groundwater). It occurs when toxic substances enter water bodies, dissolving in them, lying suspended in the water or becoming deposited on the bed. This degrades the quality of water because pollutants are discharged directly or indirectly into water bodies without adequate treatment to remove harmful compounds. Natural phenomena such as volcanoes, algae blooms, storms, and earthquakes also cause major changes in water quality and the ecological status of water. Not only does this pose an important threat to aquatic ecosystems, but the pollutants also seep through and reach the groundwater, potentially contaminating the water that we use in our daily activities, including drinking.[30]

Notwithstanding these natural phenomena, human activity contributes directly to polluted and misused water resources. Water pollution is usually caused by human activities through a number of sources. "**Point sources**" discharge pollutants at specific locations through pipelines or sewers into surface water (for example factories, sewage treatment plants, underground mines, oil wells, oil tankers and agriculture). The'eco-efficiency' concept could entail implementation of measures and tools that help reduce use of water and generation of polluted waste. On the other hand "**non-point sources**" cannot be traced to a single discharge site (for example acid deposition from the air, traffic, pollutants spread through rivers, and pollutants that enter the water through groundwater sources). Non-point pollution is therefore hard to control and thus requires collective action.

Ocean acidification

The ocean has become 30 per cent more acidic in the past two centuries.[31] This is largely due to some of the CO_2 emitted into the atmosphere by human activity which dissolves in ocean waters, forming carbonic acid. However changes in freshwater balance, heat budgets and land-ocean exchange may also play a significant role locally.

A consequence of ocean acidification is the loss of species which in turn changes the structure and dynamics of ocean ecosystems and can potentially lead to drastic reductions in fish stocks.

Unlike most other human impacts on the marine environment, which are often local in scale, the ocean acidification boundary has ramifications for the whole planet. It is also an example of how tightly interconnected the boundaries are, since atmospheric CO_2 concentration is the underlying controlling variable for both climate and ocean acidification boundaries, although they are defined in terms of

30 Source: http://wwf.panda.org/about_our_earth/teacher_resources/webfieldtrips/water_pollution/
31 UNEP 2009.

different earth system thresholds.[32] *The Future We Want* Declaration called for "support to initiatives that address ocean acidification and the impacts of climate change on marine and coastal ecosystems and resources". The Declaration also stressed the importance of the conservation and sustainable use of the oceans and seas.

Quantifying the societal costs of greenhouse gases and water in monetary terms

PUMA, with the assistance of Trucost and Price Waterhouse Coopers (PwC), has developed an environmental profit and loss account that aims to include the costs to society of environmental and social impacts for the entire global supply chain (i.e. internalize externalities). The results revealed a weighted average value (i.e. cost to society) of €0.81/m3 of water, giving a total annual water cost to society of €47.4 million for the global supply chain. This externality cost is added into the environmental accounts as a notional "shadow price".

Source: http://about.puma.com/sustainability/

2.1.6 Waste, hazardous substances and chemicals[33]

Waste

The rapid increases in the volumes and types of solid waste which occur as a result of growing urbanization and industrialization are a major concern for local and national governments, especially in developing countries. The composition of waste in many countries is changing, with the share of hazardous electrical and electronic waste (e-waste) expanding.

32 Stockholm Resilience Centre: http://www.stockholmresilience.org/21/research/research-programmes/planetary-boundaries/planetary-boundaries/about-the-research/the-nine-planetary-boundaries.html

33 Information based on the UNEP Year Book 2013 "Emerging Issues in our Global Environment".

The Global Impact of E-Waste: Addressing the Challenge

Electrical and electronic waste (e-waste) is currently the largest growing waste stream. It is hazardous, complex and expensive to treat in an environmentally sound manner. There is also a general lack of legislation or enforcement surrounding it. Today, most e-waste is being discarded in the general waste stream. Of the e-waste in developed countries that is sent for recycling, 80 per cent ends up being shipped (often illegally) to developing countries to be recycled by hundreds of thousands of informal workers. Such globalization of e-waste has adverse environmental and health implications.

A recent ILO paper elaborates on the issues posed by e-waste, the scale of its use, destinations for the trans-boundary trade flow in e-waste, risks to workers, labour and employment issues, chemicals of concern, occupational safety and health aspects, and the legal framework. It will take a systems analysis approach to the problem, explore solutions and suggest possible pathways for ILO intervention.

Download the publication at: http://www.ilo.org/newyork/publications/WCMS_196105/lang--en/index.htm

More waste will be generated as a result of growing population, rising standards of living and higher incomes which increase the demand for goods. The World Bank estimated that by 2025 2.2 billion tonnes of waste will be produced, an increase over today's production of 1.3 billion tonnes of around 70 per cent, with devastating consequences in terms of soil, water and air pollution. This in turn will have a number of consequences, including an increase in exposure to hazardous chemicals in developing countries.

When trying to estimate the costs of waste it is important to differentiate between visible direct costs and hidden indirect costs. Direct costs include waste collection and disposal costs, but the bulk of waste costs are indirect and hidden. They include:

- Raw material costs
- Energy consumption
- Water consumption
- Effluent generation
- Packaging
- Time and effort
- Economic and social cost of degraded and polluted environment[34]

34 Kunnas et al. 2012; Tol 2011; Myers 2005, among others.

Chemical dispersion

Emissions of toxic compounds such as heavy metals, synthetic organic pollutants and radioactive materials represent some of the key human-driven changes to the planetary environment. These compounds can persist in the environment for a very long time, and their effects are potentially irreversible. At present we are unable to quantify the chemical pollution boundary, although the risk of crossing earth system thresholds is considered sufficiently well-defined for it to be included in the list as a priority for further research.[35]

International framework

Chemicals are currently addressed in 18 multilateral environmental agreements (MEAs). The **Stockholm Convention on Persistent Organic Pollutants (POPs)**, for example, regulates some of the chemicals that present the greatest risks to humans and wildlife. Other MEAs which aim to reduce exposure to hazardous chemicals include the **Basel Convention**, the **Rotterdam Convention** and the **Montreal Protocol on Substances that Deplete the Ozone Layer**. The **Minamata Convention**, a newer legally binding treaty on mercury, was agreed in January 2013.

Some of these agreements are based on chemicals (Montreal, Stockholm, Minamata) while others are based on the life-cycle stage (Basel, Rotterdam). The Stockholm, Basel and Rotterdam Conventions increasingly work together as a chemicals and waste "cluster".

The **Stockholm Convention on the Protection of Human Health and the Environment from Persistent Organic Pollutants (POPs)** came into force in 2004. It restricts and aims to eliminate the production and use of listed chemicals. Twelve chemical compounds – "the dirty dozen" – were on the Convention's original list of POPs. To date, ten more POPs have been added to this list and others are under review.

35 Stockholm Resilience Centre: http://www.stockholmresilience.org/21/research/research-programmes/planetary-boundaries/planetary-boundaries/about-the-research/the-nine-planetary-boundaries.html

What are POPs?

Persistent Organic Pollutants (POPs) are organic chemical substances that are carbon-based. They possess a particular combination of physical and chemical properties. As a result, once released into the environment, they:

- remain intact for exceptionally long periods of time (many years);
- become widely distributed throughout the environment as a result of natural processes involving soil, water and, most notably, air;
- accumulate in the fatty tissue of living organisms including humans, and are found at higher concentrations at higher levels in the food chain; and
- are toxic to both humans and wildlife.

As a result of releases into the environment over the past several decades due especially to human activities, POPs are now widely distributed over large regions (including those where POPs have never been used) and, in some cases, they are found around the globe. This extensive contamination of environmental media and living organisms includes many foodstuffs and has resulted in the sustained exposure of many species, including humans, for periods of time that span generations, resulting in both acute and chronic toxic effects.

In addition, POPs concentrate in living organisms through another process called bioaccumulation. Although not soluble in water, POPs are readily absorbed in fatty tissue, where concentrations can become magnified up to 70,000 times of the background levels. Fish, predatory birds, mammals, and humans are high up the food chain and so absorb the greatest concentrations. When they travel, the POPs travel with them. As a result of these two processes, POPs can be found in people and animals living in regions such as the Arctic, thousands of kilometers from any major POPs source.

The **Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal** aims to protect human health and the environment with strict control over the adverse effects that may result from generation and management of hazardous and other wastes. It was adopted in 1989 and came into force in 1992.

The **Rotterdam Convention on the Prior Informed Consent Procedure** for certain hazardous chemicals and pesticides in international trade came into force in 2004. It promotes shared responsibility and cooperative efforts between the Parties to international trade so as to protect human health and the environment from hazardous chemicals. It also contributes to the environmentally-sound use of these chemicals by facilitating information exchange on their characteristics,

promoting a national decision-making process on their import and export, and disseminating these decisions to the Parties.

Some progress has been made towards better information provision at international level and a number of datasets are publicly available. Of particular importance is the **Globally Harmonized System of Classification and Labelling of Chemicals (GHS)**, first published in 2003 and updated every two years.[36] GHS addresses the classification of chemicals by types of hazard and proposes harmonized hazard communication procedures, including labels and safety data sheets.

Another important initiative is the **European Registration, Evaluation, Authorisation and Restriction of Chemical Substances (REACH)** system that regulates industrial chemicals. It does not cover pesticides, biocides or pharmaceuticals, as these are addressed under other European regulations. Under REACH, businesses that place chemicals on the market in the EU in quantities of over one tonne per year are obliged to provide adequate documentation on their properties, uses, and safe ways of handling them.

Lack of adequate information on chemicals, mainly as a result of failure to require generation and disclosure of the relevant information, remains a major problem. Transparency and the sharing of data and information will be essential to real progress in these areas.

In 2012 the third International Conference on Chemicals Management (ICCM3) reviewed progress and considered further measures relating to emerging policy issues, including chemicals in products, removal of lead in paints, hazardous substances in electrical and electronic products, and nanotechnology and manufactured nano-materials. It also considered perfluorinated chemicals and agreed on cooperative measures on endocrine disrupters.

Effective chemical management consciously addresses all aspects of safe, responsible and economic chemical handling – from work planning and chemical acquisition to final chemical disposal. It can be broken down into a number of definable elements – acquisition, identification, inventory, storage, distribution and disposal. Each step contains risks of incidents but also offers opportunities for economic gains, environmental protection, drastically improved workplace safety, and reductions in workplace accidents and illnesses including minimization of the severity of those that might occur.

To ensure that employees are aware of the hazards of chemicals and of how to protect themselves, the Occupational Safety and Health Administration (OSHA) issued the Hazard Communication Standard (29 CFR 1910.1200), also known as "The Right to Know" or "The Need to Know" standard. Under the Hazard Communication Standard chemical manufacturers and importers are required to determine the hazards of each chemical they produce or sell and communicate this information to the user through labels and material safety data sheets (MSDSs).

36 UN 2011.

2.2 Impact and opportunities for business

While environmental concerns generate new and emerging challenges, they also present opportunities for business. Impact on business can be positive, negative or both. The balance of challenges and opportunities will vary according to the country and region. Some challenges can be addressed by business or governments alone, while others should be tackled by both in collaboration.

Regardless of the speed of the transition towards sustainability, opportunities exist for companies that understand the implications of environmental challenges and can take account of them in their plans and strategies. If understood correctly, risks and opportunities can be turned into a long-term competitive advantage for companies. Business organizations play a key role in identifying the right opportunities for companies, at the right time.

"[Environmental] trends are likely to not only impact and influence markets but also trigger technological innovation and change while stimulating regulatory and policy developments nationally and internationally, which in turn represent opportunities for business in respect to new kinds of goods and services."[37]

2.2.1 Overview of sector-specific implications

The "GEO-5 for Business: Impacts of a Changing Environment on the Corporate Sector"[38] report identifies a number of environmental trends and their implications for business. As shown in the table below, climate change issues, land degradation, water pollution and availability, biodiversity, waste (and not only hazardous waste) and hazardous substances are the main environmental challenges which the business sector must face.

These challenges will not impact all sectors in the same way. However, because of the interdependence between sectors, impacts in one area are likely to trigger impacts in others. Synergy and cooperation are therefore required in the business sector (as well as in other sectors of society) to achieve sustainable development.

37 Ibid.
38 Ibid.

Envirnonmental Trend from GEO-5	Key implications for Business
Greenhouse gases – Greenhouse gas emissions are projected to double in the next 50 years. Such growth may lead to global average surface temperature increases of 3° C to 6° C by the end of the century [GEO-5, pp.16, 20, 36, 429]	Market shifts favouring lower-carbon products, operational and supply chain disruptions; higher cost of energy, food and other commodities shifting production and transportation patterns to adapt to local conditions
Severe Weather – There was a 230 per cent rise in the number of flood disasters and a 38 per cent rise in drought disasters occurring between the 1980s and the 2000s [GEO – 5, pp.107 – 308]	Operational and supply chain disruptions; increased cost of operations and materials; damage to shared public infrastructure increased demand for reconstruction services
Land Conversion – There is a projected increase in land requirements for urban uses by 100 – 200 million hectares over the next 40 years [GEO – 5, p.77]	New and growing markets from urban expansion; restricted access to land-based resources, loss of ecosystem services; competition for arable land; increasing pressure to protect critical natural resources
Water Availability – Global water withdrawals have tripled over the last 50 years to meet agricultural, industrial and domestic demands [GEO – 5, pp.102 -104, 436]	New markets for water/efficient products; constraints on growth due to water scarcity; operational and supply chain disruptions; conflicts with other stakeholders over limited supply; increasing cost of water
Water Pollution – Persistent toxic chemical pollutants, now found in 90 per cent of water bodies, continue to accumulate in aquatic systems [GEO-5, p.112]	Increased demand for pollution control devices and systems; increased cost of water treatments; stricter water quality regulations, increased demand for healthcare services to treat health impact
Biodiversity – Critical habitat such as forests, wetlands, and drylands continue to decline. 13 million hectares of forests were lost between 2000 and 2010. Species extinction is expected to continue as a high rate through the 21st century [GEO – 5, pp.71-72, 140, 158]	Increased market, reputational and regulatory pressure to reduce biodiversity impacts; increased cost and reduced availability of scares resources; reduced opportunity for new product breakthroughs; limitations on access to land
Chemical Exposure – More than 248,000 chemical products are commercially available, but there is a lack of data on their individual and synergistic effects on health and the environment [GEO – 5, pp. 170, 172-173, 185]	Market shifts toward "greener" products; products use restrictions; regulatory, customer, and public pressure for greater transparency
Waste – Materials are increasingly produced in one region, used in another, and managed as waste in third. The fastest growing waste stream in the world, estimated are 20 – 50 million tonnes per year, is e-waste. Which has hazardous substances as well as strategic metals that can be recovered [GEO-5, pp.176, 184]	Growing market opportunity to recover/re-use e-waste; increasing regulatory and customer pressure to reduce/manage waste; reputational damage resulting from uncontrolled waste

Source: UNEP, *GEO-5 for Business: Impacts of a Changing Environment on the Corporate Sector* (2013). http://www.unep.org/geo/pdfs/geo5/GEO5_for_Business.pdf

In the **building and construction** sector, materials such as concrete, steel and aluminum are all very energy-intensive to produce and transport. Material costs for the sector are therefore vulnerable to volatility in energy markets and price increases due to possible climate-related constraints. On the other hand, as multiple environmental pressures grow, there may be increased customer demand for building materials and designs that incorporate renewable resources and recycled materials, as well as energy-efficient and water-efficient technologies and processes.

Chemicals are another example of a sector affected by environmental trends. This sector usually relies heavily on fossil fuels and water. It faces important concerns from consumers and regulations on emissions into the air, water and waste streams, as well as potential impacts on human health. At the same time the sector can play a key role in advancing the protection of the environment and human health. In response to concerns about the impacts of chemicals on human health, wildlife, water, and the atmosphere, regulatory measures may restrict usage of some chemical sector products, as well as sector emissions. Example of key regulatory measures driving these reductions include the aforementioned Montreal Protocol and the regulation on Registration, Evaluation, Authorisation and Restriction of Chemical substances (REACH).

Population growth, urbanization and economic development in developing countries will lead to greater demand for **electricity**. Meeting this increased demand in a sustainable and efficient manner while remaining profitable will be a systemic challenge for this sector, particularly as many urban areas have inadequate energy infrastructure capacity to meet such increased demand, and rural areas in many developing countries are disconnected from the grid.

Country illustrations of renewable energy projects

The following videos provide some examples of business opportunities in the provision of alternative sources of electricity in rural areas:

- Renewables in action – Solar water pumping in the state of Karnataka, India
- Clean energy entrepreneurs powering rural areas in East Africa (Kenya and Uganda), solar lighting and biogas technologies – Promoting green entrepreneurship in East Africa
- Skills for renewable energy jobs – Bangladesh SHS Bringing green energy and green jobs to Bangladesh

Extractive companies (which encompass oil and gas production as well as mining) must operate where the resources are found. These companies also have strong links to other sectors, providing materials for the construction industry as well

as fuels for the transport and electric power sectors. Despite the importance of the sector, community opposition to extractive projects has occurred in different countries – especially developing countries – owing to concerns about the impact on water. Furthermore these types of conflict affect local perceptions of the sector around the world.

The **finance** sector (which encompasses lending, investment and insurance activities in all sectors) may increase opportunities for investments in the "green economy". Finance sector companies may themselves face increasing pressure from shareholders to issue sustainability reports and to report on their assessments of – and programmes to address – GHG emissions and other environmental impacts arising directly or indirectly from their lending, investment and financing portfolios.

Global Climate Partnership Fund

The Global Climate Partnership Fund (GCPF) is a Luxembourg-based investment fund which provides financing for sustainable energy projects in emerging and developing markets. Based on an innovative public-private partnership, the objective of which is to mitigate climate change through a reduction of greenhouse gas emissions in emerging and developing markets, GCPF focuses on financing energy efficiency and renewable energy projects, primarily in cooperation with local financial institutions, thereby creating a positive impact on the local environment and economy. It can provide dedicated funding to local financial institutions or (co)-invest directly in energy efficiency or renewable energy projects.

http://gcpf.lu/

The **food and beverage** sector is one of the sectors most exposed to environmental changes. This sector includes crop agriculture, food and beverage processing, and the retailing and marketing of food and beverages.

Recycling is an example of both a concern and an opportunity for business, specifically in terms of its cost-effectiveness. Certain materials may be waste products commonly recycled by companies while other industries may handle specialized products which are harder to recycle. Recycling is known as a process of transforming (waste) materials into new products to prevent waste of potentially useful materials, reduce consumption of fresh raw materials, reduce energy usage, and reduce air and water pollution (from landfilling). It also reduces the need for "conventional" waste disposal and lowers GHG emissions as compared to plastic production.[39]

39 Source: http://www.letsrecycle.com/news/latest-news/legislation/pm-39s-advisor-hails-recycling-as-climate-change-action

Plastic recycling in South Africa

PETCO was established in December 2004 as a Pty Ltd Company with the specific objective of promoting and improving the waste management and recycling of post-consumer Polyethylene Terephthalate (PET) products on behalf of all stakeholders in the PET industry in South Africa. (…) PETCO is headed by a board made up of representatives of Coca-Cola, the bottlers, resin manufacturers, converters and retailers. A key challenge was the establishment of sustainable and equitable funding mechanisms for an industry-wide effort. A unique levy system has secured the voluntary buy-in of industry players. (…) Much was achieved in terms of PET Recycling during the build-up to the establishment of PETCO in December 2004. Since then PETCO has provided millions of rands-worth of financial support to PET recycling companies, created income opportunities for an estimated 26 000 people, helped to establish over 430 recovery stations throughout South Africa, and is working to introduce Bottle-2-Bottle PET Recycling.

Source: http://www.petco.co.za/

Certain requirements should be present for recycling actions to be economically feasible and environmentally effective. These include an adequate source of recyclates,[40] a system to extract those recyclates from the waste stream, a nearby factory capable of reprocessing the recyclates, and a potential demand for the recycled products. These last two requirements are often overlooked. Without an industrial market for production using the collected materials and a consumer market for the manufactured goods, recycling is incomplete and can only be referred to as "collection".

In order to enhance economically relevant benefits, advocates have pushed for legislative action to increase demand for recycled materials. Without mechanisms such as tax reliefs or subsidies to internalize externalities, businesses may ignore recycling benefits, despite the costs it imposes on society.

Although the benefits of recycling over disposal are multiple, to "reduce and reuse" in the first instance, before recycling, is more beneficial to the environment. Recycling is a key component of modern waste reduction as the third element in the "Reduce, Reuse and Recycle" waste hierarchy.[41]

Existing **waste management** systems have largely been motivated by environmental and health-related concerns. To date, countries and regions have perceived waste as a problem rather than a resource. This is beginning to change in the face of

40 The term "recyclates" refers to material that is recyclable.
41 Source: http://environment.about.com/od/recycling/a/benefit_vs_cost.htm

growing geopolitical risk, soaring prices of raw materials, improved technology for the sorting and treatment of waste, and innovations in product design (for example the use of recycled materials in production, design that requires fewer materials, etc.). The logical next step is therefore to create a "circular economy" in which material waste is removed and the energy components embedded in products are conserved, reused, or disassembled so that they can be recovered. Eventually materials could be recycled into a raw material for use in the manufacture of new products or, for specific categories of materials, returned to the economic cycle in the form of recovered energy. The circular economy concept will be further explained in Section 3.

Solving the e-waste problem

Electronic waste (e-waste) includes almost any household or business item containing circuitry or electrical components with either power or battery supply. STEP (Solving the e-waste Problem) takes a life-cycle approach to the global e-waste dilemma by looking at the areas of policy, redesign, reuse, recycling and capacity-building. For 2014 and 2015 STEP members have agreed to work on six projects which involve representatives from industrial and non-industrial actors.

Source: http://www.step-initiative.org/

The business case for **energy efficiency** is clear. Existing energy efficiency technologies can cost-effectively reduce energy use in new buildings by at least 30 per cent. For example, making new buildings in China more energy efficient would reduce energy costs by more than 50 per cent, while increasing construction costs by only 10 per cent. Other benefits include alleviation of energy dependency, a decrease in vulnerability to energy price volatility, a reduction in emissions, and more efficient use of natural resources.

Sustainable land management is a knowledge-based procedure that aims to integrate management of land, water, biodiversity, and other environmental resources to meet human needs while sustaining ecosystem services and livelihoods. The World Bank defines sustainable land management as a process in a charged environment between environmental protection and the guarantee claim of ecosystem services on the one hand; and the productivity of agriculture and forestry with respect to demographic growth and increasing land use pressure on the other.

Tools created and initiatives undertaken by business and environmental organizations on biodiversity and ecosystem services

Many options exist for conserving or enhancing specific ecosystem services in ways that reduce negative trade-offs, provide positive synergies with other ecosystem services, and offer economic benefits.

The Economics of Ecosystems and Biodiversity (TEEB) is a global initiative which focuses on the economic benefits of biodiversity, including the growing cost of biodiversity loss and ecosystem degradation. Its key principle is that biodiversity and ecosystem values should be integrated more consistently and effectively into policy and regulation. The TEEB case studies describe examples where a focus on ecosystem services and their economic significance has helped decision-makers find more sustainable solutions to the management of ecosystems.

Source and access to more information: http://www.teebweb.org/

Wealth Accounting and Valuation of Ecosystem Services (WAVES) is a global partnership that aims to promote sustainable development by ensuring that natural resources are mainstreamed in development planning and national economic accounts. It brings together a broad coalition of UN agencies, governments, international institutes, NGOs and academics to implement Natural Capital Accounting (NCA) where there are internationally agreed standards, and develop approaches for other ecosystem service accounts.

Source and access to more information: https://www.wavespartnership.org

Sustainable land management practices can provide multiple benefits such as reduced erosion, building of soil fertility and structure, improved water quality, and buffering against drought. The land-use sector has the potential to play a large, positive role in the global effort to address climate change, both by reabsorbing or preventing the release of carbon dioxide and by building robust ecosystems that support adaptation to the impacts of climate change.

Overall it is clear that risks and opportunities for the business sector present important challenges. Business leaders and business associations need new skills and tools to understand and address these challenges and turn them into competitive long-term advantages.

An insight into the business opportunities of the energy sector and the efforts carried out by the industry in putting forward a strong sectoral positioning is provided below and in Annex 3.

2.2.2 The business opportunity of sustainable energy

For the **World Energy Council**[42] it is clear that the goals supported at Rio+20 in June 2012 will remain out of reach unless rapid action is taken jointly by policymakers and the energy industry in pressing ahead with sustainable energy systems. The energy industry has put forward three main recommendations to policymakers for expediting development of advanced sustainable energy systems:

1. Devise coherent and predictable energy policies. Sound policy-making determines the extent to which a country will be able to develop a sustainable energy system. The energy industry and policymakers should help nations adopt an alternative path of energy development.
2. Support market conditions that attract long-term investment in the energy sector with:
   - consistent and committed regulatory approaches;
   - development of new investment mechanisms that can reduce risks and stimulate greater private sector investment in the energy sector (for example creation of green banks, a green bond market, promotion of public-private partnerships); and
   - a stable and predictable carbon price sufficient to promote transition to a low carbon energy system.
3. Encourage initiatives that foster R&D in all areas of energy technology. Senior energy executives are convinced that to promote innovation further in all areas of energy technology, policymakers should implement goal-driven policies rather than prescriptive policies. New renewable energy and fossil fuel technologies can bring the world much closer to attaining sustainable energy systems and potentially spur economic growth. For this to happen, however, policymakers need to leave it to the market to decide which types of technology should survive so that they can remain competitive in the long term.

On the other hand the energy sector must (i) be sufficiently inclusive to provide universal access to the process of meeting energy needs while being efficient at the lowest feasible economic cost, and (ii) avoid wastage of resources. Furthermore it must be resilient to climatic, economic and technological challenges. A key issue in the coming years will be finding an appropriate balance in the composition of the technology and in the fuel mix of generation capacity.

It is crucial that policymakers and the energy industry develop a common understanding of energy sustainability, its importance for economic growth, and the steps necessary to achieve it. Only then can they work together to build on clearly defined sustainability goals that will encourage all forms of energy in nations' energy mix by taking a technology-neutral approach.

42 WEC, *World Energy Trilemma: Time to get real – the case for sustainable energy policy* (2013). http://www.worldenergy.org/publications/2012/world-energy-trilemma-2012

Sustainable Energy for All

A recent report by the UN Global Compact (UNGC) and Accenture ***Sustainable Energy for All: The Business Opportunity***[43] provides an overview of the relevance of the sustainability of the energy sector for business. This collaboration with the private sector helped to identify emerging trends, best practices and opportunity areas related to sustainable energy development. The findings presented in this report, and in the 19 related industry-specific reports, are the result of research, interviews, and focus groups conducted with more than 70 companies across 19 industries.

Because each industry has unique business attributes and characteristics, different industries will make different types of contribution to the objectives of *Sustainable Energy for All*. For example, all industries can take action to improve energy efficiency and increase their use of renewable energy, whereas fewer are in a position to contribute to improved access to energy because of the business models and the locations in which they operate. Specifically, 49 per cent of the priority actions identified are oriented towards energy efficiency, 38 per cent focus on renewable energy and 13 per cent target increased energy access.

Energy producers and providers – such as companies in the oil and gas, renewable energy, forest products, metals and mining, and utilities industries – are best placed to contribute to energy access because of their energy use or generation profile, and because they often operate in remote locations where access to energy has historically been more limited. Conversely, industries that are consumers of energy should be more focused on energy efficiency and renewable energy.

In spite of these differences between industries, many common themes arise based on an analysis of measures across all industries. Five priority actions in particular emerged as central to most industries and therefore are important for executives to consider as they plan how best to achieve the objectives of *Sustainable Energy for All* in the shortest timeframe, while realizing the increased business value:

1. Increase the energy efficiency of operations.
2. Increase the use of renewable energy in power operations.
3. Provide for energy efficiency through products and services.
4. Identify ways to beneficially reuse waste streams.
5. Educate stakeholders on how to achieve energy efficiency.

Access to energy

The expected shift in demand for energy (largely generated by the potential expansion of the energy system in Sub-Saharan Africa, as described in the first part of this section) aligns closely with the growth and market expansion strategies of many of the largest private sector businesses. As economies gain access to energy,

43 Source: http://environment.about.com/od/recycling/a/benefit_vs_cost.htm

capital and economic growth, populations start to demand products and services that require even more energy. If the world is able to provide this additional energy, it will open up large markets for the private sector across all industries. However, energy access must be provided in a sustainable way in order to minimize impacts on the environment and maximize the long-term value of investments.

A summary of the priority actions that can be taken to promote **energy access** (as identified in the industry-specific reports of the UNGC/Accenture study *Sustainable Energy for All: The Business Opportunity*) is provided in Annex 3A.[44]

Energy efficiency

In its *World Energy Outlook 2012* ***the IEA's*** policy principles for turning their **Efficient World Scenario**[45] into reality are set out. Although the specific steps will vary by country and by sector, there are six broad areas which, according to the IEA, need to be addressed:

1. Energy efficiency needs to be made clearly visible by strengthening the measurement and disclosure of its economic gains.
2. The profile of energy efficiency needs to be raised so that efficiency concerns are integrated into decision-making throughout government, industry and society.
3. Policy-makers need to improve the affordability of energy efficiency by creating and supporting business models, financing means and incentives to ensure that investors reap an appropriate share of the rewards.
4. By deploying a mix of regulations to discourage the least efficient approaches and provide incentives to implement the most efficient, governments can help push energy-efficient technologies into the mainstream.
5. Monitoring, verification and enforcement activities are essential to realizing the expected energy savings.
6. These steps will need to be underpinned by greater investment in energy efficiency governance and administrative capacity at all levels.

Given the inefficiencies of the existing building stock and the considerable growth of new constructions in economies in transition, it is likely that future energy policies will focus on the building sector.

A summary of the specific actions that can be taken by businesses to improve **efficiency** as identified in the industry-specific reports of the UNGC/Accenture study *Sustainable Energy for All: The Business Opportunity* is given in Annex 3B.

44 This annex also presents priority actions related to access as well as the use and promotion of renewable energy in different sectors.
45 The *Efficient World Scenario*, which has been developed especially for WEO-2012, is based on the core assumption that policies are put in place to allow the market to realize the potential of all known energy efficiency measures which are economically viable.

Energy mix

To maintain a stable and secure supply of electricity and make significant emission reductions in the power sector, it is imperative that all energy supply options be kept open. The optimum mix of generation resources in each country or region should be determined according to their specific circumstances including geography, power system configuration, feasibility and public acceptance. Since many countries recognize the need to continue using coal because of energy security concerns, it is important to develop advanced clean coal plants[46] and Carbon Capture and Storage (CCS) systems, and to expedite demonstration of commercial technologies. Certain stages in the development and demonstration of such technologies will need to be led by initiatives from national governments with the support and involvement of the industry.

To ensure that the growing demand for electricity is met in a secure manner, the electric power industry will need to make major investments in generation, transmission and distribution systems over the coming decades. A stable long-term investment climate is crucial if the electric power industry is to deliver this future low-carbon energy system.

A summary of the specific actions that can be taken by businesses to promote the use and production of **renewable energy** as identified in the industry-specific reports of the UNGC/Accenture study *Sustainable Energy for All: The Business Opportunity* is given in Annex 3C.

46 Examples of clean coal plants include Integrated Gasification Combined Cycle (IGCC) and Ultra Super Critical (USC) plants.

Annexes

Annex 1 – Conventions and Multilateral Environmental Agreements

For more information on the conventions and multilateral environmental agreements discussed in this Section, please refer to their official websites:

United Nation Environmental Programme: http://www.unep.org/

Vienna Convention for the Protection of the Ozone Layer: http://ozone.unep.org/new_site/en/vienna_convention.php

Montreal Protocol: http://ozone.unep.org/new_site/en/montreal_protocol.php

Convention on Climate Change: https://unfccc.int

Kyoto Protocol: https://unfccc.int/kyoto_protocol/items/2830.php

IPCC: http://www.ipcc.ch/ – http://www.ipcc-data.org

Convention on Biological Diversity: http://www.cbd.int/

Nagoya Protocol: http://www.cbd.int/abs/about/

Cartagena Protocol on Biosafety: http://bch.cbd.int/protocol/

Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa: http://www.unccd.int/

United Nations Forum on Forests: http://www.un.org/esa/forests/

Stockholm Convention on Persistent Organic Pollutants (POPs): www.pops.int

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal the Rotterdam Convention: www.basel.int

Rotterdam Convention on the Prior Informed Consent Procedure: www.pic.int

Minamata Convention on Mercury: www.mercuryconvention.org

Annex 2 – Climate change terms and concepts

It is important to clarify some "climate change" terms, specifically focusing on the impact on the business sector.

These terms have been discussed at all climate change conferences since 1992, and have been growing in importance over the last five years.

Numerous terms and concepts are introduced in climate reports, adaptation plans and dialogues by the climate community at large. In this context it is important to take into account of the fact that definitions of terms and concepts may differ between organizations and policy processes. In addition, terms are not always used consistently in a report or study.

Given the need to promote a common understanding, it is advised that policy makers (public and private) work with common definitions, at least for a core set of terms and concepts, when engaging in adaptation policy development. The UNFCC web page should be considered the central source of information.

Mitigation

The first term to be commented on is MITIGATION. The concept refers to the reduction of GHG emissions. According to the UNFCCC glossary Mitigation, in the context of climate change, is "a human intervention to reduce the sources or enhance the sinks of GHG. Examples include using fossil fuels more efficiently for industrial processes or electricity generation, switching to solar energy or wind power, improving the insulation of buildings, and expanding forests and other "sinks" to remove greater amounts of carbon dioxide from the atmosphere".

In short, the objective of climate change mitigation is lowering of GHG emissions to minimize the impacts of climate change in the future.

Developed countries, under the Kyoto Protocol, have binding obligations to reduce emissions of GHGs. Based on the agreement made under the UNFCCC countries they have created their GHG reduction policies, which affect the business sector as an actor in generation of GHGs.

For instance the UK´s Climate Change Act (2008) has the objective of reducing the UK's greenhouse gas emissions by at least 80 per cent (from the 1990 baseline) by 2050. They are trying to achieve this reduction through actions at home and abroad. To ensure UK government policies contribute effectively to their GHG reduction targets, they have set carbon budgets to limit the amount of GHGs the UK is allowed to emit over a specified time. One goal is to reduce industrial and business demand for energy by introducing smart meters and other energy-efficient measures.

Although the US has not signed the Kyoto Protocol and has no binding obligation to reduce GHG emissions, the Environmental Protection Agency (EPA) promotes GHG emissions reduction and a clean energy economy through the development of

"common-sense regulatory initiatives". EPA is also working with the private sector through voluntary energy and climate programmes.

Governments – especially in developed countries – have established reduction policies that affect the business and industry sector, not only for their home operations but also for their operations abroad, even if they are taking place in developing countries with no obligation to reduce GHG emissions.

In order to measure GHG emissions, the carbon footprint concept was developed as a way of measuring the total GHG emissions caused by an organization, event, product, person or country.

Many tools to measure the carbon footprint have been presented and developed. It is essential to understand the importance of having an agreed methodology to avoid misunderstanding and unfair competition when measuring GHG emissions.

The Greenhouse Gas Protocol (GHG Protocol), a decade-long partnership between the World Resources Institute and the World Business Council for Sustainable Development, is considered to be one of the most widely-used international accounting tools for government and business leaders to understand, quantify, and manage GHG emissions.[47]

The complexity of this issue was shown during the discussion on establishing International Standard ISO 14067: "Carbon footprint of products – Requirements and guidelines for quantification and communication". The objective of the process was to develop an international standard for increasing transparency in quantifying and reporting CO_2 emissions over the entire lifecycle of products and services – from production to recycling or waste disposal. The Standard has not been agreed on and is still under consideration.

Business actions to reduce GHG emissions are specified in Section 3.

Adaptation

Another important term is ADAPTATION. Adaptation is the "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities."[48] In a few words, Adaptation to global warming is a response to climate change that seeks to reduce the vulnerability of biological systems to climate change effects.

The UNFCCC web page states that "according to the recently released fifth assessment report of Working Group I of the Intergovernmental Panel on Climate

47 Source: http://www.ghgprotocol.org/
48 UNFCC Glossary: https://unfccc.int/essential_background/glossary/items/3666.php

Change[49] (IPCC), the atmosphere and ocean have warmed, the amount of snow and ice has diminished, the global mean sea level has risen and the concentrations of GHGs have increased. As a result of our past, present and expected future emissions of CO2, we are committed to climate change, and effects will persist for many centuries even if emissions of CO2 stop. Adaptation is needed to combat the adverse impacts of climate change that are happening now, to increase resilience to future impacts and to enable climate–resilient socio–economic development".

Climate change adaptation is especially important in developing countries since those countries are predicted to bear the brunt of the effects of climate change. As the IPCC has reported, adaptive capacity is closely linked to social and economic development.

The European Climate Adaptation Platform,[50] following the UNFCC definition, considers that various types of adaptation can be distinguished, including anticipatory, autonomous and planned adaptation. Another concept that is presented is "Adaptive capacity" in relation to climate change impacts, that is the ability of a system to adjust to climate change (including climate variability and extremes), to moderate potential damage, to take advantage of opportunities, or to cope with the consequences.

There are different ways in which adaptation can be framed; as an example an inventory has been made by the Dutch Climate Changes Spatial Planning research programme.[51]

In this context of more volatile conditions, businesses will have to adapt. They will also need to help vulnerable communities become more resilient. For business, adaptation means recognizing and preparing for impacts such as water stress, coastal flooding, community health issues, supply chain disruptions, and effects on customers and local communities, among other issues. It is important to note that this issue will increasingly impact on all companies—from small to global corporations.[52]

As regards this issue, during the Lima COP (December, 2014) the UNEP Adaptation Gap Report was presented. The report considered that "even if global greenhouse gas emissions are cut to the level required to keep global temperature rise below 2°C this century, the cost of adapting to climate change in developing countries is likely to reach two to three times the previous estimates of $70 billion-$100 billion per year by 2050".[53]

49 Established in 1988 by the World Meteorological Organization and the UN Environment Programme, the IPCC surveys world-wide scientific and technical literature and publishes assessment reports that are widely recognized as the most credible existing sources of information on climate change. The IPCC also works on methodologies and responds to specific requests from the Convention's subsidiary bodies. The IPCC is independent of the Convention. Web page: http://www.ipcc.ch/
50 Source: http://climate-adapt.eea.europa.eu/
51 Source: http://www.climateresearchnetherlands.nl
52 For more information see: http://www.wri.org/blog/adapting-climate-change-private-sector%E2%80%99s-role
53 See full report: www.unep.org/climatechange/adaptation/gapreport2014

Vulnerability

As defined in the UNFCC glossary, Vulnerability is "the degree, to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity".

According to the IPCC "Vulnerability to climate change is the degree to which geophysical, biological and socio-economic systems are susceptible to, and unable to cope with, adverse impacts of climate change. The term 'vulnerability' may therefore refer to the vulnerable system itself, for example low-lying islands or coastal cities; the impact to this system, for example flooding of coastal cities and agricultural lands or forced migration; or the mechanism causing these impacts, for example disintegration of the West Antarctic ice sheet."[54]

It was also stated that "many impacts, vulnerabilities and risks merit particular attention by policy-makers due to characteristics that might make them key. Key impacts that may be associated with key vulnerabilities are found in many social, economic, biological and geophysical systems, and various tabulations of risks, impacts and vulnerabilities have been provided in the literature (for example Smith et al., 2001; Corfee-Morlot and Höhne, 2003; Hare, 2003; Oppenheimer and Petsonk, 2003, 2005; ECF, 2004; Hitz and Smith, 2004; Leemans and Eickhout, 2004; Schellnhuber et al., 2006). Key vulnerabilities are associated with many climate-sensitive systems, including, for example, food supply, infrastructure, health, water resources, coastal systems, ecosystems, global biogeochemical cycles, ice sheets, and modes of oceanic and atmospheric circulation."[55]

Business should be sensitive to the vulnerability of the region or the community where they carry out their operations and prepare to response to new challenges.

In their WRI blog, Pieter Terpstra and Abigail Ofstedahl reported that it is important that companies "overcome these challenges and capitalize on their unique business opportunities in ways that help vulnerable communities adapt to climate change."[56]

54 Intergovernmental Panel on Climate Change, *Climate Change 2007: Impacts, Adaptation and Vulnerability: Working Group II Contribution to the Fourth Assessment Report of the IPCC Intergovernmental Panel on Climate Change* (Geneva: IPCC Secretariat, 2008).
55 Idem 7.
56 Terstra and Ofstedahl, *Micro, Small, and Medium Enterprises: Key Players in Climate Adaptation* (World Resources Institute, Making Big Ideas Happen. Last modified December, 2013. http://www.wri.org/blog-tags/8641).

Capacity-building

As mentioned in the UNFCC glossary, capacity-building – in the context of climate change – is "the process of developing the technical skills and institutional capability in developing countries and economies in transition to enable them to address effectively the causes and results of climate change."

Climate Change is a cross-cutting issue within public and private development strategies. In this regard, enhancing the capacities of public institutions, private companies and non-state actors is of utmost importance for providing essential skills to face climate change challenges.

These challenges will increase in complexity, depending on how vulnerable the country and society are.

Decision-makers (public and private) need to design and deliver climate-compatible development. There is an urgent need for technological innovations, knowledge and design management techniques, and new institutional arrangements to strengthen the country's capacity to adapt.

Developing the business sector´s capacity-building to face climate change challenges is a key factor in addressing the potential impacts of climate change (positive or negative). These capacity-building initiatives will prepare companies for balancing their production of goods and services with environmental preservation and social well-being, with a focus on sustainable development.

Disaster risk reduction

The modern paradigm of disaster management – Disaster Risk Reduction (DRR) – is being widely embraced by international agencies, governments, disaster planners and Civil Society Organizations. DRR is a systematic approach to identifying, reducing and preventing the effects of a disaster.

The DRR concept includes projects such as building secure houses in earthquake areas, implementing early warning systems for tsunamis, and managing food resources to avoid famine. It is founded on the belief that whilst disasters are inevitable, death and suffering from them is not and humans can take action to ensure this.

More generally in the climate change context, DRR is considered the concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.[57]

57 See http://climate-adapt.eea.europa.eu/glossary

It is now widely accepted, that climate change has a direct impact on the prevalence and seriousness of disasters. Higher rainfall, changing temperatures and rising sea levels are likely to make disasters more frequent in future. Adaptation to climate change and DRR both seek to achieve sustainability and reduce vulnerability.[58].

The United Nations has created the Office for Disaster Risk Reduction[59] with the mandate to serve as the focal point in the United Nations system for the coordination of DRR and to ensure synergies between DRR activities.

In accordance with its mandate, the World Conference on Disaster Reduction brings together government officials, non-governmental experts and other specialists from around the world to discuss the growing number of people affected by natural disasters. The Hyogo Framework for Action (HFA) was an outcome of the 2005 conference held in Kobe, Japan. The HFA suggests five specific priorities for action:

1. making disaster risk reduction a priority;
2. improving risk information and early warning;
3. building a culture of safety and resilience;
4. reducing the risks in key sectors;
5. strengthening preparedness for response.

Another international initiative taken in this matter is the UN Programme of Action for the Sustainable Development of Small Island Developing States, a programme acknowledged by the international community since the United Nations Conference on Environment and Development, held in Rio de Janeiro, Brazil, in 1992.

The Programme recognized that "small islands tend to have high degrees of endemism and levels of biodiversity, but the relatively small numbers of the various species impose high risks of extinction and create a need for protection. Climate change, climate variability and sea level rise are issues of grave concern. Similarly, the biological resources on which small-island developing States depend are threatened by the large-scale exploitation of marine and terrestrial living resources". It also "identifies priority areas and indicates the specific actions that are necessary to address the special challenges faced by small-island developing States. In fulfilling those actions, several cross-sectoral areas are identified, for example, capacity-building, including human resource development; institutional development at the national, regional and international levels; cooperation in the transfer of environmentally sound technologies; trade and economic diversification; and finance."[60]

58 See http://www.eldis.org/go/topics/resource-guides/climate-change/key-issues/disaster-risk-reduction#.Uwt2CuN5Mbt
59 See www.unisdr.org
60 See http://www.un-documents.net/sids-act.htm

Annex 3 – Energy

A) Priority actions to promote ENERGY ACCESS identified in the industry-specific reports of the UNGC/Accenture study

Construction industry

- Support the construction of infrastructure to supply energy to local communities.

Financial services industry

- Direct more capital toward energy access.
- Support microfinance institutions that work on energy access, energy efficiency.
- Support policy frameworks that drive investment in energy access.

Forest products industry

- Beneficially reuse waste streams to generate energy and expand renewable energy use for operations.
- Expand production and sale of wood pellets as a renewable energy source in home heating, cooking and power generation.
- Support regulation to develop sustainable forestry management standards, access to raw materials and renewable energy policies.

The Metals and Mining Industry

- Partner with local governments and utilities to provide energy services to communities surrounding operational locations.

The Oil and Gas Industry

- Reduce the flaring of gas from operations and identify opportunities to reuse captured gas on-site or provide energy to local communities.
- Promote international trade in sustainable energy products.
- Use innovative business models and create new products and services to improve energy affordability and to enable access to clean cooking and heating solutions.

The Professional Services Industry

- Provide services focused on improving energy access, energy efficiency, and renewable energy use.
- Promote awareness related to Sustainable Energy for All and create positive messages around the initiative's objectives.

The Renewable Energy Industry

- Conduct reverse innovation[61] of core products to provide greater energy access.
- Improve understanding of barriers to expanding energy access and renewable energy in developing economies, develop innovative solutions and build capacity for technology operation and maintenance.

The Utilities Industry

With regard to energy access, utilities can expand service to developing urban areas as well as partner with governments and other organizations to expand access to rural areas, especially in developing countries. Priority actions:

- Deploy distributed energy technologies (micro-or off-grids) to advance rural electrification efforts.
- Use innovative business models and create new products and services to improve energy affordability among low-income populations.
- Leverage existing infrastructure to advance urban and semi-urban electrification efforts.
- Create new products and services to increase unsustainable consumption by end-customers.

B) Priority actions to promote ENERGY EFFICIENCY identified in the industry-specific reports of the UNGC/Accenture study

The Automobile Industry

- Improve vehicle fuel economy.
- Manufacture flexible-fuel vehicles and educate customers on the usage and benefits of flexible fuel vehicles.
- Manufacture automobiles that derive energy from sources other than petroleum.
- Make production processes more energy-efficient and identify opportunities to reuse waste streams.
- Use renewable energy to power operations.
- Promote fuel-saving strategies among drivers.

The chemicals industry

- Improve the energy efficiency of production processes.
- Use more energy-efficient techniques to generate electricity and steam in operations.
- Develop products and services that drive consumer energy efficiency and enable increased renewable energy uptake.

61 The term 'reverse innovation' refers to the process by which companies in emerging markets produce inexpensive goods and services to meet the needs of the poor and then repackage them as cost-effective innovations for industrialized.

- Establish an integrated enterprise energy management function within the organization.
- Beneficially reuse waste streams as process inputs or to generate energy.

The construction industry

- Reduce consumption of raw materials by sourcing recycled, repurposed and renewable resources.
- Increase the use of renewable energy and alternative fuels.
- Increase energy efficiency of processes and facilities.
- Construct and renovate buildings so they are energy-efficient and produce their own electricity.
- Facilitate product recycling and identify opportunities to beneficially reuse waste.
- Promote energy-efficient building codes and regulatory incentives for more energy-efficient building projects.

The Consumer Packaged Goods Industry

- Reduce product packaging and increase the use of renewable feedstock in its manufacture.
- Increase the energy efficiency of operations in manufacturing and distribution.
- Create products that enable consumers to be more energy efficient.
- Reduce the amount of energy required to refrigerate and cool products.
- Minimize energy required to source, treat, heat and transport water.

The financial services industry

- Direct more capital toward energy access and the commercialization of energy efficiency and renewable energy technologies.
- Increase energy efficiency of operations.
- Use renewable energy to power operations and facilities.
- Support microfinance institutions that work on energy access, energy efficiency, and renewable energy.
- Support policy frameworks that drive investment in energy access, renewable energy and energy efficiency.

The Food and Agriculture Industry

- Create closed-loop systems that reuse waste streams as production inputs.
- Increase the energy efficiency of growing food crops.
- Increase the energy efficiency of production, packaging, and transportation processes.
- Use waste streams to provide energy access in areas where access is limited

The Forest Products Industry

- Beneficially reuse waste streams to generate energy and expand renewable

energy use for operations.
- Improve the energy efficiency of operations.
- Modify current or create new pulp and paper manufacturing facilities as new innovative "bio-refineries".

The Health Care Industry

- Increase energy efficiency of operations.
- Develop and purchase energy-efficient medical devices.

The Industrial Manufacturing Industry

- Increase use of combined heat and power and distributed renewable power generation at manufacturing facilities.
- Improve the energy efficiency of operational processes.
- Incorporate more energy-efficient design into core product streams and explore the practical use of new and emerging technologies.
- Empower employees to cut energy consumption through behavioral changes and continuous improvement programs.
- Increase cross-industry collaboration and partner with academic institutions and policymakers to drive innovation and technological breakthroughs.

Information and Communications Technology

- Increase virtualization of products, services, and processes.
- Develop products and services that enable cities and urban areas to be more energy-efficient and integrate renewable energy.
- Continue development of products and services in support of smart grids.
- Develop products and services to improve the energy efficiency of travel and logistics.
- Develop products and services that improve the energy efficiency of vehicles.
- Improve the energy efficiency of the products and services offered to the market.
- Increase the energy efficiency of operations.
- Use renewable energy to power operations and facilities.
- Support policies that encourage information and communications technology-enabled energy efficiency and renewable energy.

The Metals and Mining Industry

- Partner with local governments and utilities to provide energy services to communities surrounding operational locations.
- Improve the energy efficiency of current operations.
- Build advanced energy considerations into the design and development of new assets and operations.
- Diversify the portfolio to develop products and generate materials that drive energy efficiency and renewable energy uptake.

- Use waste and process outputs as fuel sources.
- Use more renewable energy sources to support operational power needs.

The Oil and Gas Industry

- Use more renewable energy sources and emphasize energy efficiency throughout the entire fuel supply chain.
- Reduce the flaring of gas from operations and identify opportunities to reuse captured gas on-site or provide energy to local communities.
- Invest in R&D and utilize core competences to bridge the gap from fundamental research to commercialization of liquid renewable transportation fuels and renewable generation technologies.
- Promote international trade in sustainable energy products.
- Use innovative business models and create new products and services to improve energy affordability and to enable access to clean cooking and heating solutions.

The Pharmaceuticals and Biotechnology Industry

- Increase the energy efficiency of operations.
- Assess the lifecycle energy demand for products and services and work to increase the overall energy efficiency of products and services.
- Reduce packaging waste associated with products and reduce the energy intensity of packaging.
- Work to influence public policy that will advance energy efficiency and deployment of renewable energy, and encourage innovation.

The Professional Services Industry

- Improve the energy efficiency of operations and increase renewable energy use.
- Provide services focused on improving energy access, energy efficiency, and renewable energy use.
- Promote awareness related to Sustainable Energy for All and create positive messages around the initiative's objectives.
- Educate employees on energy efficiency and the benefits of renewable energy.

The Retail Industry

- Increase energy efficiency of operations.
- Utilize renewable energy to power operations.
- Increase the portfolio of energy efficient products.
- Work with suppliers to increase supply chain energy efficiency.

The Transportation and Logistics Industry

- Improve operations of vehicles, vessels or aircraft to maximize energy efficiency of transport.
- Upgrade fleet to enable use of alternative, less carbon-intensive fuels and drive the use of renewables.
- Improve the intermodal and trans-modal transfer systems to increase energy efficiency.
- Partner with manufacturers to improve the design and energy performance of vehicles, vessels, and aircraft.

The Travel and Leisure Industry

- Increase energy efficiency of hospitality operations.
- Optimize flight operations to maximize fuel efficiency.
- Increase the use of renewable energy to power operations.
- Purchase energy efficient consumer goods and appliances.
- Build and renovate hotels so they are energy efficient and produce their own electricity.

The Utilities Industry

- Increase adoption of smart grid technologies to modernize the grid.
- Improve energy efficiency in operations. Increase adoption of alternative energy vehicle infrastructure and a low carbon grid.
- Educate consumers on how to improve energy efficiency.
- Create new products and services to increase sustainable consumption by end-customers

C) Priority actions to promote the use and production of RENEWABLE ENERGY identified in the industry-specific reports of the UNGC/ Accenture study

The Automobile Industry

- Manufacture flexible-fuel vehicles and educate customers on the usage and benefits of flexible fuel vehicles.
- Manufacture automobiles that derive energy from sources other than petroleum.
- Use renewable energy to power operations.

The Chemicals Industry

- Develop products and services that drive consumer energy efficiency and enable increased renewable energy uptake.
- Develop more renewable and bio-based feedstocks.
- Use more renewable energy for operational energy needs.

The Construction Industry

- Increase the use of renewable energy and alternative fuels.
- Construct and renovate buildings so they are energy efficient and produce their own electricity.

The Consumer Packaged Goods Industry

- Reduce product packaging, and increase the use of renewable feedstock in its manufacture.
- Use renewable energy to power operations and facilities.

The Financial Services Industry

- Direct more capital toward energy access and commercialization of energy efficiency and renewable energy technologies.
- Use renewable energy to power operations and facilities.
- Support microfinance institutions that work on energy access, energy efficiency, and renewable energy.
- Support policy frameworks that drive investment in energy access, renewable energy and energy efficiency.

The Food and Agriculture

- Create closed-loop systems that reuse waste streams as production inputs.
- Increase the use of renewable energy to meet operational energy needs.

The Forest Products Industry

- Beneficially reuse waste streams to generate energy and expand renewable energy use for operations.
- Promote the development of new feedstocks.
- Modify current or create new pulp and paper manufacturing facilities as new innovative "bio-refineries".
- Expand production and sale of wood pellets as a renewable energy source in home heating, cooking and power generation.
- Support regulation to develop sustainable forestry management standards, access to raw materials and renewable energy policies.

The Health Care Industry

- Increase the use of renewable energy to power operations.

The Industrial Manufacturing Industry

- Increase use of combined heat and power and distributed renewable power generation at manufacturing facilities.
- Increase cross-industry collaboration and partner with academic institutions and policy-makers to drive innovation and technological breakthroughs.

Information and Communications Technology

- Develop products and services that enable cities and urban areas to be more energy-efficient and integrate renewable energy.
- Continue development of products and services in support of smart grids.
- Use renewable energy to power operations and facilities.

The Metals and Mining Industry

- Build advanced energy considerations into the design and development of new assets and operations.
- Diversify the portfolio to develop products and generate materials that drive energy efficiency and renewable energy uptake.
- Use waste and process outputs as fuel sources.
- Use more renewable energy sources to support operational power needs.

The Oil and Gas Industry

- Use more renewable energy sources and emphasize energy efficiency throughout the entire fuel supply chain.
- Invest in R&D and utilize core competences to bridge the gap from fundamental research to commercialization of liquid renewable transportation fuels and renewable generation technologies.
- Promote international trade in sustainable energy products.

The Pharmaceuticals and Biotechnology Industry

- Drive advancements in second generation biofuels development within the biotechnology industry.
- Utilize renewable energy to power operations and facilities.
- Work to influence public policy that will advance energy efficiency and deployment of renewable energy, and encourage innovation.

The Professional Services Industry

- Improve the energy efficiency of operations and increase renewable energy use.
- Provide services focused on improving energy access, energy efficiency, and renewable energy use.
- Promote awareness related to Sustainable Energy for All and create positive messages around the initiative's objectives.
- Educate employees on energy efficiency and the benefits of renewable energy.

The Renewable Energy Industry

- Continue advancing next-generation renewable technologies.
- Conduct reverse innovation in core products to provide greater energy access.
- Increase the energy efficiency and use of renewable energy in manufacturing and operational processes.
- Support policies that increase renewable energy generation in both developed

and developing economies.
- Improve understanding of barriers to expanding energy access and renewable energy in developing economies, develop innovative solutions and build capacity for technology operation and maintenance.

The Retail Industry

- Utilize renewable energy to power operations.
- Increase the portfolio of energy efficient products.

The Transportation and Logistics Industry

- Upgrade fleet to enable use of alternative, less carbon-intensive fuels and drive the use of renewables.
- Partner with manufacturers to improve the design and energy performance of vehicles, vessels, and aircraft.

The Travel and Leisure Industry

- Increase the use of renewable energy to power operations.
- Build and renovate hotels so they are energy-efficient and produce their own electricity.

The Utilities Industry

- Deploy distributed energy technologies (micro- or off-grids) to advance rural electrification efforts.
- Use innovative business models and create new products and services to improve energy affordability among low-income populations.
- Increase adoption of smart grid technologies to modernize the grid.
- Integrate a higher percentage of renewable energy into the electrical grid.
- Increase adoption of alternative energy vehicle infrastructure and a low-carbon grid.
- Create new products and services to increase sustainable consumption by end-customers.

Key learning points

2.1 Global environmental challenges

Over the last 50 years environmental degradation has expanded from a local to a global scale. As a result, the gap between our current level of consumption and the level which the global environment can sustain continues to grow. We are approaching – and in some cases surpassing – the limits of our planet's resources and carrying capacity. Not only is the situation environmentally unsustainable, but it also presents substantial economic and social costs.

The magnitude of environmental problems and their costs for society

Ecosystems provide a multitude of resources and processes to humans. Collectively, these benefits are known as **ecosystem services** and encompass products such as clean drinking water and timber as well as processes including the decomposition of wastes and climate regulation. The human species, while buffered against environmental changes by culture and technology, is fundamentally dependent on the flow of ecosystem services. And so is business.

Three major problems associated with the management of the world's ecosystems are already causing significant harm to societies:

1. Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber, and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on earth.
2. The changes that have been made to ecosystems have contributed to substantial net gains in human well-being and economic development, but these gains have been achieved at growing costs in the form of the degradation of many ecosystem services, increased risks of nonlinear changes, and the exacerbation of poverty for some groups of people. These problems, unless addressed, will substantially diminish the benefits that future generations obtain from ecosystems.
3. The degradation of ecosystem services could grow significantly worse during the first half of this century and is a barrier to achieving the Millennium Development Goals.

With the purpose of presenting the most relevant environmental concerns in an organized and succinct manner, **six major global environmental challenges** have been identified. Each encompasses more than one environmental problem and they often share common causes, consequences and solutions.

Air pollution

Since late 1970s the use of chlorofluorocarbons (CFCs) and other ozone-depleting substances (ODS) has slowly eroded the stratospheric ozone layer, creating a major potential health hazard. Action on this issue was taken by the international community in 1985 at the Vienna Convention for the Protection of the Ozone Layer. In addition, the Montreal Protocol (1987) phased out production of numerous substances believed to be responsible for ozone depletion.

A second related phenomenon is climate change which is largely due to human activities that have released greenhouse gases into the atmosphere. The first international policy responses on this matter, which have then rapidly become a top priority in the international development agenda, can be identified in the Convention on Climate Change (1992) and in the Kyoto Protocol (1997).

Energy

Addressing the lack of access to clean, reliable and affordable energy services for billions of people is one of the world's most critical development challenges and is becoming increasingly prominent on the international agenda.

Improving energy efficiency is one of the most cost-effective ways of mitigating climate change, accounting for 50% of the potential to halve energy related CO_2 emissions by 2050. The business case for energy efficiency is clear and includes reducing energy costs, alleviating energy dependency, decreasing vulnerability to energy price volatility, reducing emissions and improving the efficient use of natural resources. However energy efficiency faces barriers when it comes to implementation and so demands a number of policies to address these challenges.

Another energy-related concern is the energy mix. A clear, unambiguous and well-structured energy policy framework is required in all countries to shift the energy mix and deliver emission reductions faster than historical energy trends would otherwise suggest.

Finally, a very controversial source of low-cost and clean energy is represented by nuclear power. Main benefits are the supply stability, economic efficiency and lack of CO_2 emissions. However, civil society seems to be against it after the numerous accidents that have happened in the past.

Biodiversity

Both plant and animal species have been disappearing at 50-100 times their natural rate, owing to such factors as the large-scale clearance and burning of forests, over-harvesting of plants and animals, indiscriminate use of pesticides, draining and filling of wetlands, destructive fishing practices, air pollution, and

the conversion of wild lands to agricultural and urban uses.

A whole range of activities, programs and projects are in hand to preserve biodiversity. Among them are purification of air and water, maintenance of soil fertility, measures to mitigate and adapt to floods and droughts, detoxification and decomposition of wastes, maintenance of concentrations of vital gases and water vapour in the atmosphere, and control of infectious agents in the environment. These policy responses are the outcome of many international initiatives started in the 90s: among them we recall the Convention on Biological Diversity (CBD), the Cartagena Protocol on Biosafety, the Nagoya Protocol, the UN Decade on Biodiversity. Further to these policy initiatives, the degree of natural urgency and the demands and expectations of societies make the topic one of the most important issues responsible businesses have to take into account.

Land use and soil degradation

The most common forms of unsustainable land use are over-cultivation, overgrazing, deforestation and poor irrigation practices. Land-use change is one driving force behind serious reductions in biodiversity. A major challenge in setting a land use boundary is that it needs to reflect not only the absolute quantity of unconverted and converted land but also its function, quality and spatial distribution. In particular, two phenomena seem to be a big source of concern: desertification and deforestation. These issues have been addressed in the UN Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD) and in the establishment of the United Nations Forum on Forests (UNFF) which adopted the landmark Non Legally Binding Instrument on All Types of Forests on 28 April 2007.

Water

Pure water is in short supply. Our global reserves of drinkable water are a fraction of 1% and one human being in five lacks access to potable (safe) water. The rationale for the sustainable development and management of the earth's water resources was clearly articulated in Chapter 18 of Agenda 21, the Program of Action adopted in Rio in 1992. Some years later the United Nation's Millennium Development Goal (1999) (MDG) 7 — "Ensure environmental sustainability" — included the target of reducing by half the proportion of people without access to safe drinking water, by the year 2015.

In this context, two related phenomena that have attracted the attention of policy makers worldwide are water pollution, especially when caused by human activities, and ocean acidification, a direct consequence of the CO_2 emitted into the atmosphere by human activity which then dissolves in ocean waters forming carbonic acid.

Waste, hazardous substances and chemicals

Growing urbanization and industrialization also leads to rapid increases in the volumes and types of solid waste. At the same time the composition of waste in many countries is changing, with the share of hazardous electrical and electronic waste (e-waste) expanding. Particular attention has been focused on those hazardous chemicals that present risks to humans and wildlife which are currently addressed in 18 multilateral environmental agreements. Among these we recall the Conventions of Stockholm, Basel, Rotterdam, Montreal and Minamata. Other important initiatives are the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) and the European Registration, Evaluation, Authorisation and Restriction of Chemical Substances (REACH) system that regulates industrial chemicals. To ensure that employees are aware of the hazards of chemicals and of how to protect themselves, the Occupational Safety and Health Administration (OSHA) issued the Hazard Communication Standard (29 CFR 1910.1200), also known as "The Right to Know" or "The Need to Know" standard.

2.2 Impact and opportunities for business

While environmental concerns generate new and emerging challenges, they also present opportunities for business. Impact on business can be positive, negative or both. The balance of challenges and opportunities will vary according to the country and region. Some challenges can be addressed by business or governments alone, while others should be tackled by both in collaboration.

Overview of sector-specific implications

Climate change issues, land degradation, water pollution and availability, biodiversity, waste (and not only hazardous waste) and hazardous substances are the main environmental challenges to be faced by the business sector. Undoubtedly, these challenges are likely to impact on all sectors in different ways, but the interdependence between sectors means that impacts on one may very well trigger impacts on others. So synergy and cooperation are required in the business sector, as well as in other sectors of society.

Many sectors are exposed to environmental changes, in particular the building and construction, chemicals, electricity, extractive, finance, food and beverage, and recycling sectors seem to be the most sensible and interested in this global challenge/opportunity.

Of particular importance is the recycling concept, a key component of modern waste reduction and the third component of the "Reduce, Reuse and Recycle" waste hierarchy. The future goal should be to create a "circular economy" in which eventually materials could be recycled into a raw material for use in the manufacture of new products or, for specific categories of materials, returned to

the economic cycle in the form of recovered energy.

Finally, sustainable land-management practices such as conservation agriculture, intercropping and sustainable forestry can provide multiple benefits such as reduced erosion, building of soil fertility and structure, improved water quality, and buffering against drought.

The business opportunity of sustainable energy

The energy industry has put forward three main recommendations to policymakers for expediting development of advanced sustainable energy systems: (i) devise coherent and predictable energy policies; (ii) support market conditions that attract long-term investment in the energy sector; and (iii) encourage initiatives that foster research and development in all areas of energy technology. On the other hand the energy sector must be sufficiently inclusive to provide universal access to the process of meeting energy needs while being efficient at the lowest feasible economic cost, and avoid wastage of resources.

The IEA has individuated six broad areas of policy intervention: energy efficiency needs to be made clearly visible by strengthening the measurement and disclosure of its economic gains; the profile of energy efficiency needs to be raised so that efficiency concerns are integrated into decision making throughout government, industry and society; policy makers need to improve the affordability of energy efficiency by creating and supporting business models, financing vehicles and incentives to ensure that investors reap an appropriate share of the rewards; by deploying a mix of regulations to discourage the least efficient approaches and incentives to deploy the most efficient, governments can help push energy-efficient technologies into the mainstream; monitoring, verification and enforcement activities are essential to realizing the expected energy savings; these steps will need to be underpinned by greater investment in energy efficiency governance and administrative capacity at all levels.

Finally, the optimum mix of generation resources in each country or region should be determined according to the specific circumstances including geography, power system configuration, feasibility and public acceptance.

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Section 3

The greening of enterprises

3.1 Green business: the link between the environment and enterprise performance

3.1.1 Business case for greener business

Since the publication of the Brundtland Report in 1987, the definition of sustainable development has been "to meet the needs of the present without compromising the ability of future generations to meet their own needs" (see Section 1). Sustainable development should also improve the quality of life for every individual without expending the earth's resources beyond its capacity. The journey towards sustainable development requires businesses, governments and individuals to take action by changing consumption and production habits as well as practices, and devising appropriate policies.

For the past 250 years, growth has occurred largely at the expense of the environment. As discussed in Section 2, environmental damage is now approaching a scale at which it begins to threaten growth perspectives and to hinder social progress.

All economic activities involve either direct or indirect use of natural capital assets. Since a large part of economic activities is performed by businesses, enterprises have a strong effect on how natural capital assets are used. The way of doing business is indeed at the core of the paradigm shift needed, particularly when considering the total environmental effects of products in a life-cycle perspective: that is, from raw material extraction, to production, and the use and disposal of manufactured outputs.

The trade-off between growing economic activities and degrading natural capital assets

"Natural capital assets fall into two categories: those which are non-renewable and traded, such as fossil fuel and mineral 'commodities'; and those which provide finite renewable goods and services for which no price typically exists, such as clean air, groundwater and biodiversity. During the past decade commodity prices erased a century-long decline in real terms, and risks are growing from over-exploitation of increasingly scarce, unpriced natural capital. Depletion of ecosystem goods and services, such as damages from climate change or land conversion, generates economic, social and environmental externalities. Growing business demand for natural capital, and falling supply due to environmental degradation and events such as drought, are contributing to natural resource constraints, including water scarcity."

Source: Natural Capital at Risk: The Top 100 Externalities of Business, TEEB, April 2013

Section 2.2.1 discusses the implications of environmental degradation to businesses: from physical risks to operations, reputational risks and the risk of regulations hampering competitiveness. Environmental challenges and regulations are therefore a material concern for many businesses. At the same time, there is increasing evidence of businesses that have yielded significant returns on investment and reputational benefits by efforts to reduce their emissions, waste, materials or energy consumption. Many companies are expanding due to the growing demand for green technologies, sustainable products and services. As a consequence, businesses are increasingly calling upon governments to implement comprehensive climate and environmental policies, in the hope of opening up new opportunities and markets.

As voiced by global business coalitions throughout the process which led to the adoption of the post-2015 development agenda (see Section 1), companies could take a leading role in reconciling business and society. Sophisticated business and progressive leaders have already recognized this opportunity and promising elements of new business models are emerging. For instance, a growing number of enterprises have started to incorporate sustainability measures and environmental considerations into their business strategies. This shift is apparent in the global surveys on sustainability conducted annually since 2010 by the Massachusetts Institute of Technology (MIT) Sloan Management Review and the Boston Consulting Group, which chart how organizations have tackled sustainability-related challenges – from resource scarcity to customer demands for healthier products – with innovations that create business value.

"This year [2013], the trend toward profit continued: key measures bumped up and showed that sustainability is paying off for a growing number of companies. Overall, the portion of respondents reporting profit from sustainability went up 23 per cent, to 37 per cent of the total. But perhaps most important: nearly 50% of companies have changed their business models as a result of sustainability opportunities — a 20 per cent jump over last year. […] business-model innovation is the crux of sustainability profits. Companies reporting that it adds to their bottom lines leverage these innovations to translate sustainability opportunities and pressures into business value."[1]

Through years of monitoring of business activities, the Eco-Innovation Observatory[2] has analysed both challenges and opportunities that businesses can face when reducing their environmental impact. The analysis has shown that the tangible barrier represented by costs can be overcome by economic efficiencies and business gains at every stage of the product and operational cycle. The figure below summarises these findings and lists some opportunities that can make the business case for a company.

1 David Kiron, Nina Kruschwitz, Knut Haanaes, Martin Reeves and Eugene Goh, *The innovation bottom line*, MIT Sloan Management Review and the Boston Consulting Group, 2013. http://sloanreview.mit.edu/reports/sustainability-innovation/.

2 See http://www.eco-innovation.eu/

The business case for eco-innovation

Life-cycle stage	Environmental consideration	Business case
Resource extraction	• Reduce environmental pressures and impacts by limiting extraction of virgin resources and by limiting "unused" extraction	• Consider renewable and secondary resources (circular economy) • Reduce cost by improving efficiency of extraction • Comply with and anticipate new regulations • Improve your reputation CSR (Corporate Social Responsibility)
Manu-facture	• Use fewer resources, including energy • Use materials with less environmental impacts (substitutes) • Produce less pollution and waste	• Reduce production costs by improving material and energy productivity and by material substitution • Build resilience to changes in commodity prices and resources supply • Increase your turnover and profits from sales of resource-efficient products and services • Comply with and anticipate new regulations (including eco-design)
Distribution	Reduce impacts, for example through: • Better packaging design, reuse, recycling • Fuel and energy use reduction in transportation and storage	• Cost reduction • Regulatory compliance
Use	• Use less resources, including materials, energy, land and water • Cause less pollution and waste	• Shift to selling services from products (i.e. functional sales, including product leasing and sharing) • Improve your reputation and customer relations • Comply with and anticipate new regulations
End of life	• Reduce impacts of waste disposal by decreasing the volume of waste or by improving the quality of waste	• Develop and sell novel products and materials from waste • Reduce costs by reusing, recovering or recycling resources from your own or external waste streams (e.g. industrial ecology, Cradle to Cradle) • Comply with and anticipate new regulations

Source: EIO 2012.

With the overall purpose of enhancing the capacities of employers' organizations to improve enterprise competitiveness in national and global markets, this section will address the key reasons for applying green strategies to enterprise development, examining the drivers of change and the challenges of changing business practices, introducing a discussion on concepts and tools for green enterprises and green business creation, and concluding with the enabling factors for green enterprise promotion.

The definitions of **green economy** and **green growth** given by UNEP, OECD and the World Bank (see Section 1) provide a useful overarching framework in this regard. They refer to:

1. The identification of new sources of growth through:

- resource efficiency to balance the increasing cost of materials, energy and waste management (focus: productivity);
- green business profile to fulfil customer demand and increase sales (focus: confidence and stability); and
- opening up new markets for (new) eco-friendly products by stimulating demand for green technologies, goods and services (focus: innovation and job creation);

2. The reduction of risks relating to environmental degradation and resource depletion, such as:

    - production bottlenecks due to resource scarcity and reduced quality;
    - business losses, physical and infrastructural damages due to the impact of climate change and natural and man-made environmental disasters; and
    - price volatility due to the reduced access and depletion of natural resources as well as increasing imbalances in natural systems leading to, for example, reduced fertility of soils, difficult access to water, etc.

Green growth is a paradigm which offers a viable pathway for both developing and high-income countries to address unsustainable and inefficient growth patterns. However, while encouraging enterprises to embark on such new patterns of growth, it is important to emphasize that the private sector alone cannot lead societies onto a sustainable path. There is a critical and essential role for policy-makers in supporting the private sector in such a challenging transformation, through adoption of environmental regulations and market-based instruments that internalize natural capital costs and reduce the profitability of polluting activities. In addition, governments can facilitate changes by:

- providing enabling **framework conditions**, i.e. regulatory and fiscal framework, financial incentives as well as withdrawing subsidies favouring unsustainable practices;
- providing **direct support** to sustainable business by funding or co-funding eco-innovation, R&D for cleaner production, etc.;
- **increasing demand** for sustainable products and services through green public procurement;

- engaging in public-private partnerships agreeing on specific **targets**;
- **leading by example** by e.g. improving energy and resource efficiency of government and public buildings, greening their services and adopting sustainable public procurement practices.

Green Public Procurement (GPP)

The public sector is of immense importance to the development of the green market, since public demand can drive business and product innovation. Public authorities are major consumers and through their purchasing power they can choose goods and services with lower impacts on the environment, and therefore make an important contribution to sustainable consumption and production. Green purchasing is also about influencing the market. By promoting and using GPP, public authorities can provide industries with real incentives for developing green technologies and products. In some sectors public purchasers command a large share of the market (for example public transport, construction, health services and education) and therefore their decisions have considerable impact. It is the intention that 50 per cent of public procurement in the EU should be green, in line with the standards of GPP in the EU.

Establishing requirements for performance or functionality rather than technical standards is another way of enhancing, through GPP, an innovative market for environmentally competent enterprises. Performance-based or functional specifications describe the desired result and the outputs (for example in terms of quality, quantity, and reliability) that are expected, including how they will be measured. It does not prescribe the inputs or working method for the tenderer, who is free to propose the most appropriate solution. A performance-based approach usually allows more scope for market creativity and in some cases will challenge the market to develop innovative technical solutions.

3.1.2 Drivers for change

The drivers for change from business as usual to environmentally sustainable economies and enterprises are complex and interlinked. The key external and internal drivers which encourage businesses to adopt greener approaches are summarized below.

External drivers

Increasing environmental regulations and market incentives, and their effect on the business community

An increasing number of countries incorporate environmental policies and standards into national development strategies, thus allowing an across-the-board shift, away from frameworks that consider economic growth as the only valid indicator of development. Well-designed environmental policies can meet citizens' aspirations for environmental quality without imposing excessive burdens on the economy.[3] Policies can play an encouraging role in creating the environment for industry to comply with new regulations; developing and implementing programmes and support schemes for business to move towards green enterprises; and communicating the market opportunities.[4] This is a trend not only in countries where a long-past industrialization process has brought about the current environmental situation, but also in countries still in a phase of industrialization, such as China.

China has grown at an annual rate of approximately 10 per cent per year over the past 30 years, transforming it from a poor country to the world's second largest economy. Yet the Chinese government is now reconsidering the strategy that permitted this economic miracle in the hope of greening its development process. Two factors motivate this (possible) change in approach: (i) the cost of environmental degradation, estimated at 9 per cent of gross domestic product (GDP), is threatening both economic competitiveness and welfare; and (ii) China is looking for new sources of growth, supported by innovation and higher value-added production while aiming to be a frontrunner in the race towards greener production processes and products.

Other examples of countries include Brazil, Indonesia, Mexico, Morocco and Tunisia, which are greening their growth processes or considering green industries as growth sources. Ethiopia and Trinidad and Tobago are developing green growth strategies and many other countries, such as South Africa, are hoping to better balance the environment with the economic imperative of rapid growth.[5]

In the European Union (EU) a flagship initiative for resource efficiency was launched in 2011. A key aim of this initiative is to create a sound basis for investment and innovation by forging an agreement on a long-term vision and ensuring that all relevant policies factor in resource efficiency in a balanced manner. It provides a long-term framework for action in many policy areas, supporting policy agendas for climate change, energy, transport, industry, raw materials, agriculture, fisheries, biodiversity and regional development, all with the common aim of supporting green growth.

3 OECD, 2014.
4 Sharpe and Ison, unpublished 2014.
5 WB 2012.

How can green policies contribute to economic growth?

Green policies and regulations can contribute to growth in several ways:

- They can help **increase the amount of natural, physical and human capital available**: better-managed soil is more productive; well-managed natural risks result in lower capital losses from natural disasters; healthier environments result in more productive workers.
- They can **promote efficiency at various levels**. The current global growth patterns are highly inefficient because they are based on short-term results rather than long-term. Green policies make it possible to enhance efficient growth patterns, for instance, by imposing environmental taxes (taxing "bads") and removing distortionary subsidies in order to create fiscal space for governments to lower labour taxes or subsidize green public "goods" such as eco-friendly public transport or renewable energy. For example, in addition to reducing traffic the congestion taxes in London have helped finance investments in the ageing public transport system. This has in turn increased the effectiveness of the price signal by reducing the costs or "disutility" associated with switching from single-car use to public transport. Similarly in other sectors many firms – including large multinationals such as Hewlett Packard, Cisco, Clorox, and FedEx – are finding that embracing sustainability has in part improved their bottom lines by promoting greater efficiency.[6]
- **Green policies stimulate innovation**. Evidence reports that well-designed (environmental) regulation stimulates innovation as measured by R&D spending, patents and/or new products, processes and services.[7] Surveys of firms in the EU identify existing or future environmental regulation as the main driver for adoption of incremental innovation. Similarly, international sustainability standards can help local firms, in countries at all stages of development, upgrade their environmental conduct under the form of catch-up innovation. On a local policy making level, green public procurement creates a demand for sustainable products, services and infrastructure, which can motivate companies to shift to more sustainable practices and further scrutinize the footprints of their supply chains. Green policies can also encourage new forms of entrepreneurship and business models, like the ones focusing on shifting from product selling to service provision.
- **Product-related instruments** are a form of **market incentive approach** through which governments regulate the sale and use of products. Generally there are four categories: environmentally related product taxes; tax differentiations; deposit-refund systems and extended producer responsibility. Regulated markets will be subjected to increasing costs, but these instruments can also drive businesses into new markets for cleaner products or create opportunities in waste management and recycling. Product standards and eco-labelling provides a complementary role by steering consumers to less-damaging products.

6 Nidumolu, Prahalad&Rangaswami 2009.
7 e.g. BERR (2008): Regulation and Innovation: Evidence and policy implications.

Responding to consumer expectancy to engage in responsible environmental practices

The changing consumer expectations are also driving business to be more environmentally responsible. Linked to the previous external driver, government initiatives can lead to increased environmental awareness and demand within the community by:[8]

- building knowledge and skills through education campaigns on consumption patterns and behaviours, and information about options and performances;
- providing certification/verification including energy efficiency standards for homes and appliances, fuel economy standards for vehicles, CO_2 emission labels for cars and other forms of verification that reduce individual risk and verification costs for consumers;
- providing systematic development of markets by creating market conditions through environmental-related taxes or financial subsidies and providing market support.

In reaction to these induced changes in consumption patterns, businesses can take on a stewardship role, by reducing the environmental impacts of production while contributing to societal health and wellbeing. Three areas of business response to consumer environmental expectations include: value proposition; value creation and delivery; and value capture.[9] In addition, the business response is also linked to the internal driver of creating business sustainability through competitive advantage (see internal drivers below).

Urgency to respond to environmental challenges due to the effect of natural resource depletion on growth

As discussed in Section 2, environmental challenges are becoming a pressing priority if business is to prosper in the twenty-first century.

Increased resource consumption has already led to raw material scarcity in some regions and industries. The business community is expecting an overall increase in resource scarcity in future years. According to a 2012 study from the Netherlands, 63 per cent of participating firms expect to face raw material scarcity within 5 years, rising to 70 per cent over a 10-year horizon and beyond. Furthermore 96 per cent of the firms expect significant or moderate impact on business performance due to raw material scarcity. The study further concludes, however, that a mere 10 per cent of those firms have implemented comprehensive strategies which address supply risk.[10]

8 Sharpe and Ison, unpublished 2014.
9 Bocken, Short, Rana and Evans, 2014.
10 KPMG 2012, 3-4.

The strategic implications of disruptive resource-related trends will vary from sector to sector, but resource-related issues will become an increasingly important component of business strategy in all sectors. A broad range of businesses will need to consider how they can adopt a joined-up approach to understanding how differentiation in resources might shape profitability across their operations, produce new growth opportunities, and pose new challenges for risk management.

In addition, whereas the limited natural resource base of the planet was for many years viewed as the sole source of limits to growth, modern growth theory recognizes that limits to growth may also arise from nature's limited ability to act as a sink for human wastes. In economics the concern over the ultimate exhaustion of oil and metals has to some extent given way to concern over air quality, global warming and industrial production emissions. When environmental quality falls the policy response may in turn limit growth through more intensive clean-up or abatement efforts that lower the return on investment, or growth may be limited when humans do such damage to the ecosystem that it deteriorates beyond repair and settles into a new lower, less productive steady state.[11] Environmental considerations are becoming an integral part of growth theory and thereby of strategic business development and planning.

Enterprises' dependency on commodity prices: towards material and energy efficiency

Linked to the external driver of natural resource depletion, enterprises need to consider how to factor resource-related issues much more directly into their strategic thinking and operational planning. For much of the twentieth century companies were able to ride the wave of lower real resource prices. There was, for many businesses, no need to make resource productivity a strategic priority. However, in a world where resource scarcity – and environmental and regulatory risk – is likely to increase over the next 20 years, companies need to exert much more leadership in their resource agenda in order to mainstream the new paradigm throughout their organizations.

Increases in resource prices over the past decade have already wiped out the price falls of the entire twentieth century. Price rises have varied significantly, depending on the resource; for example energy prices have increased by 190 per cent over the past decade, food by 135 per cent, and materials by 135 per cent. The volatility and unpredictability of resource prices is at an all-time high; since the turn of the century, the average annual volatility of resource prices has been more than three times that witnessed over the course of the twentieth century and more than 50 per cent higher than in the 1980s.

Energy and natural resources prices are expected to rise in the future, due to a number of macro-economic, financial, structural and technological factors. In

11 Brock & Taylor 2005.

addition, an expected larger demand from developing and emerging economies, combined with a steady decrease in resource availability is forcing businesses to develop new and innovative ways of securing resources for their further production or eliminating their dependency on these resources altogether through changes either to the product (design, production etc.) or to the business strategy (for example product versus service).

Internal drivers

Creating more value with less impact

Decades ago companies and regulatory authorities in different countries around the world, especially industrialized countries, foresaw environmental problems arising from a local emphasis on higher smokestacks and longer discharge pipes in order to dilute the pollution and avoid harming people including local recipients.

While the dilution approach is still applied and may turn to be valid depending on the local context, over the past few decades many companies have assumed more responsibility for the environment and have demonstrated that environmental initiatives and improvements can be more proactive and bring economic benefits:

- From their inception in the 1980s pollution prevention measures have paid off; implementing cleaner technologies via good housekeeping and optimization of production processes have reduced resource use, emissions and waste, and generated significant economic savings for companies.
- In the 1990s companies began to implement environmental management systems (EMS) such as ISO 14001 to secure continuous improvements in their environmental performance. Integrating quality, workplace management, and environmental management systems created new opportunities for companies such as lower resource consumption, enhanced image recognition, and improved relationships with external stakeholders including local communities, authorities, and NGOs.
- In 1992 the World Business Council for Sustainable Development (WBCSD) was already introducing the "eco-efficiency" concept in its publication 'Changing Course', to highlight the link between environmental improvements and economic benefits. It is based on the concept of creating more goods and services while using fewer resources and creating less waste and pollution; in short, "creating more value with less impact."
- Many businesses now embrace the life-cycle concept, recognizing that products have environmental impacts over their entire product life, namely that the use, disposal, and distribution of products affects the environment. Through improvements introduced over a product's life, businesses can potentially gain further economic benefits, both in relation to the product (for example less material waste, hazardous materials eliminated) and on the market (for example improved image and competitive advantage).

Improved competitiveness through sustainability

Enterprises harvesting the commercial benefits of improved sustainability have understood that improved competitiveness is key to sustainability. The figure below illustrates the different types of competitive advantage that can be achieved through **strategic sustainability efforts at enterprise level**.

Competitive advantages of strategic sustainability efforts

Source: PlanMiljoe

Risk reduction should be an essential part of company strategy because sustainable production and environmental standards can be the decisive factor in whether a company can operate on global markets, and likewise in local markets. The general

public, authorities and customers are all increasingly focusing on environmental problems. Companies must therefore constantly seek to minimize environmental risks as part of their operations. They must also be at the forefront of legislation and take into account the environmental and social impacts generated by their production, for failure to do so can have costly consequences. Complying with environmental standards can be a licence to operate in certain markets and a company that violates environmental laws can be disqualified from selling its products or services. Risk reduction can also be a competitive factor when trying to attract qualified and committed employees and ensure a good company reputation. Finally, resource constraints can be the driver of risk management strategies. Increasing resource prices, and lack of water or energy or access to rare earth metals, are key issues for most companies. The benefits of risk reduction can be:

- secure access to raw materials, water, energy and other resources;
- avoidance of public scandals; and
- being at the forefront of local and international environmental legislation.

Risk reduction for greater sustainability

The Danish SME, **GH Form**, is an example of a business applying strategic sustainability efforts that focus on risk reduction. GH Form produces cast iron products such as lamp-posts and gratings. Production relies heavily on iron ore, a raw material in increasingly high demand. To secure access to iron ore and to strengthen their competitive advantage, GH Form has initiated a series of innovative changes to their business strategy. One such major change is the establishment of a leasing strategy, creating a shift from selling to leasing products. The main advantage for the company is that they retain ownership of the products, enabling them to access the raw material at the end of its life for use in future production. This strategy also places the company in charge of maintenance and repairs while the client is leasing the product. This enables the company to ensure optimal handling of the products, which will make them suitable for recycling.

Effectiveness as a competitive environmental strategy is about saving money while improving environmental performance by using fewer resources (water, energy, raw materials) and producing less waste. With the increasing cost of gas, electricity, water and waste disposal, it becomes increasingly effective for companies to reduce waste and avoid production errors, eliminate redundant workflows, and so forth. The benefits of implementing a more efficient production can include:

- direct financial savings from reduced raw materials, water, energy and other resource costs;
- direct savings from reduced costs for waste management;
- greater productivity through improved utilisation of raw materials;
- reduced operational and maintenance costs;
- increased employee motivation for continuous improvement; and
- improved attractiveness for employees, better workplace health, safety and morale.

Enhanced effectiveness is achieved both through optimization of production processes and through employee involvement and improved working conditions (this is further expanded in 3.3 Towards sustainable workplaces).

Improving productivity and workplace practices in the tourism sector

SIMAPRO is a methodology that the ILO promotes in Latin America and the Caribbean. It is based on social dialogue and answers the needs expressed by organizations and social partners. It allows the linking of productivity in organizations with a systematic review of the labour competence of the staff, who actively participate in identifying and overcoming obstacles in production processes. In **Mexico** SIMAPRO has been applied to the tourism industry in three regions, namely Mexico City (Federal District), Morelos and Bahía de Banderas. It has been applied to the following areas: food and beverage; stewardship; and housekeeping, laundry and maintenance. In the three regions overall improvements in working conditions have been identified, through (i) a downstream and upstream communication model, (ii) workers becoming involved in decision-making for providing solutions and generating proposals for continuous improvement, allowing for the capitalization, development and recognition of the talent, experience, knowledge and skills of the team, (iii) staff awards scheme integrating incentives at personal, group and organizational levels, and (iv) leaders developing new competences to take on the role of facilitators of their teams.

Increased sales as a strategic approach to environmental work can both help retain existing customers and to acquire new ones. With increased sales as a strategic focus, environmental actions often originate from the requirements of important customers. Environmental measures can work as added-value in a product, creating a more loyal customer relationship. For some enterprises environmental consciousness is an integral part of the company's image and values. For most companies it will be a competitive advantage to be able to offer a product that

has the lowest total cost when viewed in a life-cycle perspective – by offering a durable and well-designed product with low energy consumption and minimal disposal costs.

The advantages of applying environmental awareness as part of a sales strategy can include:

- improved image;
- attraction of new customers;
- retaining a loyal customer base;
- offering tailored solutions to customers; and
- creating mutual dependency between producer and customer.

Following increased awareness among businesses and consumers alike of global and local environmental problems and the role of industry in this regard, an increasing number of businesses have begun communicating openly on the environmental consequences of their production as well as on their goals for a more sustainable future. Such communication, through reports and advertisement, serves the purpose of improving business image and retaining a loyal customer base, while increasing sales.

Puma's sustainability strategy

The **Sport lifestyle company Puma** is an example of a multinational company that communicates openly on environmental issues. Besides a Code of Ethics and a Handbook of Environmental Standards, the company also publishes sustainability reports on an annual basis. Puma links to the sustainability reports of most of its suppliers. Publishing such reports and announcing strategies and goals, such as Puma's roadmap towards zero discharge of hazardous chemicals in the supply chain by 2020 – all of which are voluntary – is an increasingly used tool for creating a competitive advantage for businesses working to reduce their environmental impact. The communication aspect is important when the aim is for enhanced environmental performance to translate into business growth through increased sales and customer loyalty (PUMA 2013).

For more information, see: http://about.puma.com/en/sustainability

Coca-Cola PET Bottle Made Entirely From Plants

At the World Expo that took place in Milan in 2015, the Coca-Cola Company presented the world's first PET plastic bottle made entirely from plant materials and fully recyclable. "PlantBottle packaging is The Coca-Cola Company's vision to develop a more responsible plant-based alternative to packaging traditionally made from fossil fuels and other non-renewable materials. PlantBottle packaging uses patented technology that converts natural sugars found in plants into the ingredients for making PET plastic bottles."

Source: http://www.coca-colacompany.com/stories/coca-cola-produces-worlds-first-pet-bottle-made-entirely-from-plants/

Environmental measures can also be used proactively to win **new markets and create new products**. Innovative processes that focus on environmental impacts can lead to new and greener products, either by radically changing the product or by replacing components or suppliers so as to enhance environmental performance. This strategic approach can also lead to a shift in focus on the origins of new and green business models – for example Product-Service Systems (PSS) under which companies shift their operations from selling products to leasing the service that the product delivers, or by creating closed product loops which ensure manufacturer access to the products once they are discarded by the consumers. New markets and products can improve company competitiveness by:

- opening up new markets (for example through green products and cleaner production);
- redefining the products or services offered; and
- adding value-creating services to the product.

Adding value while generating environmental benefits

The Italian producer of detergents and cosmetics, Allegrini S.p.A., added a Product-Service System to their business services in 1998 with the Casa Quick concept. Casa Quick is a home-delivery distribution of detergents that enables customers to stock up on the preferred quantity and quality of detergents using reusable plastic bottles from a mobile van outside their front door. Besides the environmental benefits, this Product-Service System also provides added value both to the customers and to the company: the customers save time and money by not having to go to the store for detergent and they receive expert advice on how to use the products most efficiently. The company saves money on packaging (over a one-year period no container had been replaced) and retains a loyal customer base (UNEP 2002, 19).

3.1.3 Barriers to change towards greening

Although business leaders increasingly understand importance of greening, **significant challenges still remain which prevent many companies from becoming green enterprises**. Some of these challenges include the following:

- Often there is a lack of information and awareness on enterprise/entrepreneur side that prevents knowledge of business owners to become green. However, early movers in business and industry have invested in development of sustainable products, but consumer preferences have so far not always matched corporate aspirations. **Education and information** tools are important for enhancing consumers' and business/entrepreneurs SCP awareness. In some instances there may be good reasons for using government incentives to promote SCP, and government can also bring about shifts in certain markets as a major consumer.
- Business and industry require an **enabling environment** to help shift markets towards sustainable consumption and production. This includes a rational mix of legislation, regulation, voluntary agreements, economic instruments, integrated product policies and stakeholder engagement. To shape this enabling environment, governments need to develop strategic and practical plans and engage business and industry in the process of consultation, policy formulation and implementation.
- Effective **communication channels** must be opened to enable business and industry to hold meaningful **dialogue with governments and other stakeholders**, for example through industry roundtable discussions to address specific industrial sectors in respect of which public policy instruments best promote resource efficiency and the life-cycle economy.
- Many companies experience **resource and capacity constraints** in incorporating international standards in their business operations and in purchasing the new technology needed.

While these challenges apply to companies of all sizes, SMEs may experience additional difficulties in greening their operations. A crucial challenge to SMEs is acquiring the time, energy and competence for environmental development. The manager is typically occupied with production and volume of orders, and few SMEs employ staff with specific capacity for green innovation. The time and cost needed for an innovation to penetrate the market represent another major challenge. The cost of developing an eco-innovation without access to seed finance can cause an SME to fall at the first hurdle. Finding such financing can be difficult, particularly when eco-innovations are widely viewed as risky. Such perceptions are influenced by the longer period required for investment returns associated with eco-innovation.

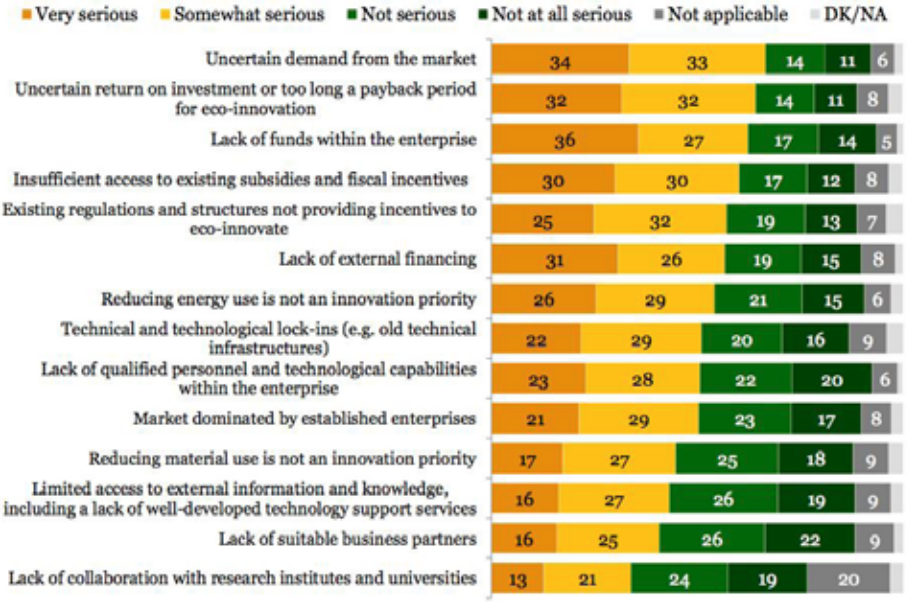
Larger companies could be perceived as harvesting a greater proportion of the overall benefits of new green markets due to their capacity to absorb investment costs. On the other hand, smaller companies individually gain proportionally more than larger organizations from resource efficiency measures and are far more flexible in changing their production processes. However not all opportunities are "low hanging fruit". Many require investment and, for small companies in particular, access to finance may be difficult, resulting in an advantage for larger companies – other elements being equal. In surveys of companies' sustainability efforts, issues with a financial theme (such as funding, grants, loans, investment capital and cash) feature in the top three critical considerations in business decision-making on resource efficiency measures. Where access to funding is constrained, for example by macro-economic conditions, it is probable that resource efficiency measures will be abandoned, deferred or cut back.

Furthermore, the challenging context for business includes a range of other pressures on company costs, including rising raw material prices; increased volatility; and increasing internalisation of external costs in the supply of key resources. Additionally, competition in the market may restrict the ability of a business to pass on all or parts of these costs to customers, implying irrecoverable cost-base increases.

Barriers in European Union

The Flash Eurobarometer survey (EC 2011) analysed over 5,000 European SMEs' views about their perceived barriers to an accelerated development and uptake of eco-innovation. In order to do this, 14 potential barriers were presented to interviewees and they were asked, for each one, whether they considered these to be a serious obstacle or not to boost eco-innovation in their company.

Barriers to accelerated eco-innovation uptake and development



Source: Flash Eurobarometer No 315 – Attitudes towards Eco-Innovation

For each of the potential barriers related to financing and funds, a majority of respondents thought that it was a very or somewhat serious barrier to an accelerated development and uptake of eco-innovation. More than two thirds of managers said that a lack of funds within their enterprise was a very serious or somewhat serious barrier, while many pointed out that the lack of external financing also contributed to this problem.

Insufficient access to existing subsidies and fiscal incentives was considered a barrier by 6 in 10 respondents. Furthermore, 64 per cent of interviewees said that an uncertain return on investment or too long a payback period for eco-innovations stopped them from introducing such innovations

Two-thirds of the responses indicated that the uncertain demand from the market was a barrier, but they were considerably less likely to say that they could not find suitable business partners to develop eco-innovations. A majority of respondents also said that existing regulations and structures did not provide incentives to eco-innovate. At the same time they were less likely to identify technical and technological lock-ins or a market dominated by established companies as major obstacles.

A lack of qualified personnel and technological capabilities within their enterprise was considered a very or considerably serious barrier. A smaller number of respondents thought that limited access to external information and knowledge, including a lack of well-developed technology support services, was a barrier to introducing eco-innovations. Finally, less than half of respondents answered that reducing their use of energy and materials was not an innovation priority thus it created a barrier to any other potential innovation in these areas.

The analysis of EIO country profiles (EIO 2011) offers a complementary perspective to reflect upon the barriers to eco-innovation in EU Member States. The country reports also reveal that the regulatory and policy framework is one of the most important determinants of eco-innovation development in the EU. Several countries report that weak regulations and a lack of relevant policies form a barrier to eco-innovative initiatives.

In many countries seed funds and venture capital necessary for technology transfer and commercialisation projects seem to be critical points and are largely lacking. Among the socio-cultural factors, weak linkages and cooperation between research and industry appear to be among the most common barriers to eco-innovation, especially as regards translating inventions onto the market, defining priorities, and knowledge exchange (information flows). Lack of entrepreneurship in 'green markets' is said to be due to cultural risk aversion among citizens, SMEs and potential investors.

Barriers in developing countries

Based on the analysis eco-innovation in emerging markets conducted by EIO (2012), companies in developing countries may face a number of barriers in their greening efforts. Generally, small businesses in developing and transition economies lack the resources and knowledge to improve their environmental and social performances and to develop related products and services. On the other hand, introducing product and process eco-innovations in these countries does not always offer sufficient economic returns. For example, the relatively low price of fuel in many developing countries, combined with the high investment costs of machines result in long payback periods for investments in energy efficiency. This problem is also linked with the lack of economic incentives from governments to pursue eco-innovative business initiatives. While the support of generic entrepreneurship and attraction of Foreign Direct Investment (FDI) has been acquiring increased attention in the developing world, a specific focus on eco-innovative business and investments is largely lacking. In addition, there are lower levels of awareness among both private and public actors of the advantages of eco-innovative solutions and this means that there is currently a limited market for eco-innovative businesses and products. In addition, trade related barriers are a common issue, most notably in Africa, where the lack of harmonised monetary and financial regulations is a serious hindrance to foreign investment.

In many countries, limited regulatory frameworks and poor economic conditions still hinder the widespread implementation of eco-innovations. Institutional and regulatory problems are the most commonly identified barriers in the context of the internationalisation of companies in developing countries. These include policies on attracting foreign investors and/or companies and international policies focusing on indigenous eco-innovation capabilities. While the countries of East Asia have been actively introducing policies for attracting FDI and facilitating the exchange of expertise, other regions lack similar initiatives.

Barriers to eco-innovation per region

	Barriers	Overall regional relevance		
		Asia	Latin America	Africa
Economic barriers	Lack of investments and access to financial tools			
	Lack of governmental economic incentives			
	Lack or limited access to IPR			
	Lack of consumer demand for eco-innovative products & services			
	Failure of markets to capture economic and environmental benefits			
	Trade barriers			
Institutional barriers	Lack of adequate institutional policies			
	Lack of effective public-private partnership for eco-innovative markets			
	Inefficient administrations and regulations (e.g. custom), corruption			
Technological & knowledge-base barriers	Lack of adequate infrastructure			
	Lack of access to skilled human resources			
	Lack of technologies tailored to the region's needs			
Other barriers	Stagnant business mentality of local actors			
	Perception of high risks linked to eco-innovation business			
	Cultural barriers facing newcomers in developing countries markets			

Strong barrier Medium barrier Weak barrier

Source: EIO (2012).

Problems with the enforcement of existing regulations, administrative inefficiencies, corruption and lack of transparency are among the biggest barriers for foreign companies seeking to enter developing country markets. Poor governance structures and poor communications between government agencies also restrict the widespread implementation of eco-innovative business strategies. Small businesses in developing countries have little access to finance, which hampers their emergence and eventual growth. One of the major problems affecting entrepreneurs and SMEs in developing countries is their role in the informal economy. Many enterprises are not officially registered and consequently cannot get access to formal markets and official financial tools.

The lack of adequate infrastructure such as electricity networks, water supply and roads, prevents foreign companies, and not only those specialising in eco-innovation, from entering markets in developing countries. Studies on FDI in developing countries show that the availability of infrastructure is especially critical for foreign SMEs, as large corporations are often able to ensure their own investments in infrastructure, once they settle their operations in a new country.

3.2 Greening enterprises: concepts and tools

The concept of green(er) enterprises combines business growth and competitiveness with the needs of people to facilitate a decent living in a healthy environment. Reducing environmental impacts can be a way for business to enhance competitiveness and secure sustainable growth.

The approach, which can also be applied to the greening of the value chain, consists of two main strategies:

1. ***the greening of existing enterprises,*** which focuses on process; and
2. ***the creation of green enterprises or green businesses*** to produce green goods and services.

Greening of enterprises means helping enterprises of all types to continuously improve their resource productivity and environmental performance (greening the process). It also entails changing workplace behaviour and practices through housekeeping measures, process control, and new technologies and equipment, all of which aim at cleaning the various aspects of production. From an ILO perspective, greening the workplace must include the strengthening of competitiveness and increasing both the quantity and quality of jobs while protecting the environment.

Creation of green enterprises means facilitating creation of new enterprises that deliver green goods and services or business diversification within existing enterprises to tap into green market opportunities.

This two-pillar approach complements the ILO's Sustainable Enterprise concept[12] by strengthening its environmental dimension and by boosting sustainable patterns of production that are material- and energy-efficient, low-waste, low-polluting and generating economic and social returns. Sustainable enterprises therefore create jobs and improve livelihoods without compromising the environment.

A range of well-established approaches exist that can guide both strategies: greening existing and setting new green business. The table below lists the most widely applied concepts, methodologies and approaches. It is important to take into account the fact that many of them overlap and therefore terminology is often used in an interchangeable way.

12 Anchored in the ILO's mission to create decent work for all women and men, this programme is centred on three pillars: i) an enabling environment for enterprises – creating the right framework that enables businesses to start, grow and create decent jobs; ii) entrepreneurship and business development – helping entrepreneurs, in particular youth, women and marginalized groups, to start and build successful enterprises; iii) sustainable and responsible workplaces – demonstrating the link between productivity gains and improved working conditions, good industrial relations and good environmental practices.

Main concepts, approaches and methodologies and their definitions

Concept	Approach	Definition
Eco-efficiency	Organizational framework	Eco-efficiency is a management philosophy that encourages business to search for environmental improvements that yield parallel economic benefits. It focuses on business opportunities and allows companies to become more environmentally responsible and more profitable. It is a key business contribution to sustainable societies. Eco-efficiency is achieved by the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life-cycle to a level at least in line with the earth's estimated carrying capacity
Cleaner production	Methodology applied at enterprise level	The continuous application of an integrated preventive environmental strategy to processes, goods, and services to increase overall efficiency, and reduce risks to humans and the environment. Cleaner Production can be applied to the processes used in any industry, to goods themselves, and to various services provided in society.
Environmental management system	Organization management system	An environmental management system (EMS) is part of an organization's management system used to develop and implement its environmental policy and manage its interactions with the environment. A management system is a set of interrelated requirements used to establish policy and objectives, and to achieve those objectives it includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources.
Sustainable supply chain management	Supply-chain strategic approach	Responsible sourcing is a voluntary commitment by companies to take into account social and environmental considerations when managing their relationships with suppliers. This strategy is now an integral part of effective supply chain management. As production chains expand, companies of all sizes and sectors are devoting more efforts to managing supply chain risks and building long-term supplier relationships. Improving social and environmental performance in production chains is becoming a major element of this process.
Life-cycle thinking	Management approach applied to the whole production and consumption cycle	Life cycle thinking expands the traditional focus on the production site and manufacturing processes and incorporates various aspects over a product's entire life cycle from cradle to cradle (i.e. from the extraction of resources, through the manufacture and use of the product, to the final processing of the disposed product)
Circular economy	Concept applied at company, industry, and economy levels	Circular economy is one that is restorative and regenerative by design, and which aims to keep products, components and materials at their highest utility and value at all times, distinguishing between technical and biological cycles. In practical terms Circular economy promotes re-using, repairing, refurbishing and recycling of existing materials and products, as well as better eco-design of products that will allow their durability, repairability, recyclability and waste prevention. Circular economy is becoming one of the key strategies in the EU supporting its resource efficiency and competitiveness goals. The circular economy was adopted by the Chinese Government in 2001 as the development model for China to follow.

Concept	Approach	Definition
Sustainable consumption and production	Concept applied at value chain level	The concept of sustainable consumption and sustainable production refers to: "the total use of resources as well as the resulting emissions, effluents and waste; aiming to minimize negative environmental impacts; and promoting well-being. Its focus on the sustainable and efficient management of resources at all stages of value chains of goods and services encourages the development of processes that use fewer resources and generate less waste, including hazardous substances, while yielding environmental benefits and frequently productivity and economic gains. Such improvements can also increase the competitiveness of enterprises, turning solutions for sustainability challenge into business, employment and export opportunities. SCP also encourages capturing and reusing or recycling valuable resources, thereby turning waste streams into value streams ('cradle-to-cradle')."[13] The use of services and related products, which respond to basic needs and bring a better quality of life while minimising the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardise the needs of future generations.
Eco-innovation	Broad concept applicable at enterprise, entrepreneurship and organizational levels	Eco-innovation is the introduction of any new or significantly improved product (good or service), process, organizational change or marketing solution that reduces the use of natural resources (including materials, energy, water and land) and decreases the release of harmful substances across the whole life-cycle. As all innovations, eco-innovation means bringing a new product (good or service) to the market or implementing a new solution in the production or organizational processes of a company. What distinguishes it from other innovations, however, is that eco-innovation results in both economic and environmental benefits.
Green business model	Business strategy applied at value chain level	Business models which support the development of products and services (systems) with environmental benefits, reduce resource use/ waste and which are economic viable. These business models have a lower environmental impact than traditional business models.
Green entrepre-neurship	Business strategy applied for the creation of new businesses	Green entrepreneurship is based on development of eco-innovative products or services or amendment business strategies in order to focus on sustainability. A new product or service can work either as an addition to the existing production (i.e. a green production line) or as a foundation for the entire production process (for example by establishing a new business based on high environmental standards or by shifting entirely to the production of green products).

Sources: adapted from UNEP, 2010 and 2012b, Eco-innovation Observatory 2011,[14] Ellen MacArthur Foundation, 2014,[15] FORA, 2010,[16] ILO and OECD.

13 Harold Samuel, ed. Jorge E. Viñuales. (2015). The Rio Declaration on Environment and Development. A Commentary. Oxford University Press.
14 EIO 2011, Introducing eco-innovation: from incremental changes to systemic transformations, http://www.eco-innovation.eu/media/EIO_introduction_brief1.pdf
15 http://www.ellenmacarthurfoundation.org
16 FORA (2010), Green Business Models in the Nordic Region: A key to promote sustainable growth, Green paper for the Nordic Council of Ministers, FORA, Copenhagen, www.foranet.dk/media/27577/greenpaper_fora_211010.pdf

In the following pages the abovementioned definitions are presented and complemented with real examples demonstrating concrete applications of both strategies: greening of the existing businesses and opening of new green enterprises.

Useful literature and websites on green business concepts and tools

Publications

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The Sustainable Materials Management Coalition. 2014. *Guidance on Life-Cycle Thinking and Its Role in Environmental Decision Making* (Washington). Available at: https://www.michaeldbaker.com.

UNEP. 2012a. *The Business Case for the Green Economy. Sustainable Return on Investment*. Available at: http://www.unep.org/publications/contents/pub_details_search.asp?ID=6263.

UNEP. 2012b. *Sustainable Consumption and Production for Poverty Alleviation*. Available at: http://www.unep.org/publications/contents/pub_details_search.asp?ID=6260.

Yacooub, A.; Fresner J.. 2006. *Half is Enough - An Introduction to Cleaner Production* (Beirut, LCPC Press).

Websites

Cleaner and sustainable production, UNIDO, http://www.unido.org/cp.html

The Circular Economy, Ellen Macarthur Foundation, http://www.ellenmacarthurfoundation.org/circular-economy

Eco-Innovation, The Eco-Innovation Observatory, http://www.eco-innovation.eu/

Environmental Management Systems Explained. The Basics, Institute of Environmental Management and Assessment, http://ems.iema.net/emsexplained

ISO 14000. Environmental management, The International Organization for Standardization, http://www.iso.org/iso/home/standards/management-standards/iso14000.htm

What is Life Cycle Thinking?, UNEP/SETAC Life Cycle Initiative, http://www.lifecycleinitiative.org/starting-life-cycle-thinking/what-is-life-cycle- thinking/

3.2.1 Greening of enterprises

The definition of these approaches will now be presented in turn, further along with successful examples of their applications. All are related to the assumption that enterprises should operate in ways that secure long-term economic performance by avoiding short-term behavior that is socially detrimental or environmentally wasteful. In this perspective, they also form the basis for holistic approaches leading societies to more sustainable production and consumption patterns, including 3Rs (reduce, reuse and recycle) and the waste management hierarchy (See Annex 2).

Eco-efficiency

Eco-efficiency is an organizational framework which guides enterprises on areas for saving money by improving environmental performance, involving the use of fewer resources (water, energy, materials, etc.) and minimization of waste. The concept was introduced by the WBCSD in 1992.

As introduced in Section 1, based on the WBCSD definition, eco-efficiency is achieved through delivery of "competitively priced goods and services that satisfy human needs and bring quality of life while progressively reducing environmental impacts of goods and resource intensity throughout the entire life-cycle to a level at least in line with the earth's estimated carrying capacity".

According to the WBCSD, critical aspects of **eco-efficiency** are:

- reduced material-intensity of goods or services
- reduced energy-intensity of goods or services
- reduced dispersion of toxic materials
- improved recyclability
- maximum use of renewable resources
- greater durability of products
- increased service intensity of goods and services

The benefits of introducing eco-efficiency into the production process can include:

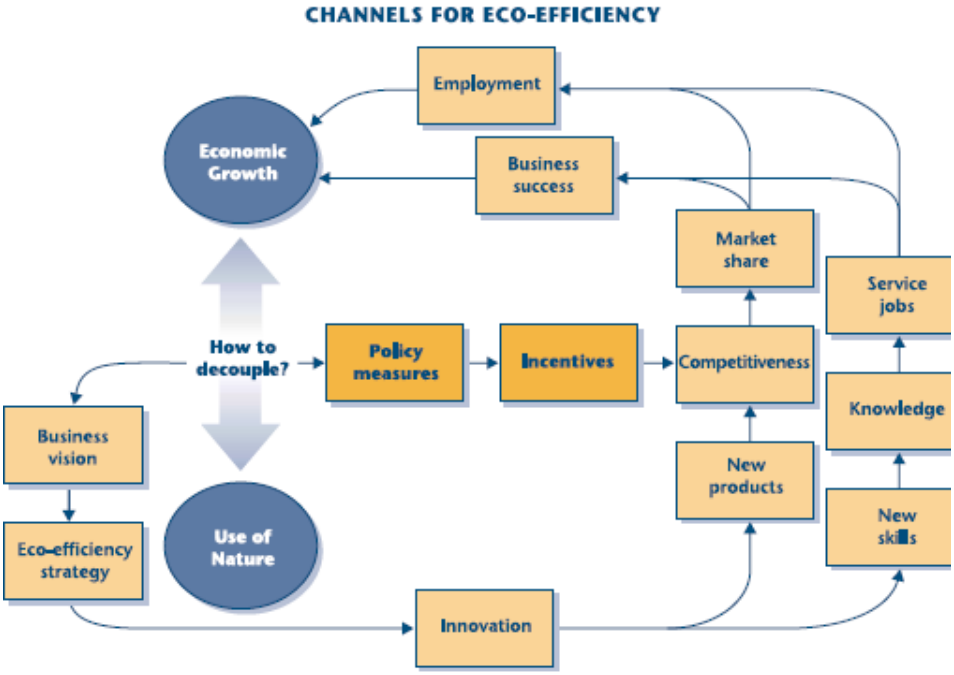
- direct financial savings from reduced use of materials, water, energy and other resources
- savings from reduced generation of waste
- enhanced efficiency through improved use of raw materials and inputs
- lowered operational and maintenance costs
- increased employee motivation and productivity
- improved health, safety and workplace morale

Eco-efficiency in manufacturing: the example of Unilever

Reducing the impacts of manufacturing operations is a core part of the Unilever Sustainable Living Plan, which sets out approximately 60 time-bound, publicly-reported targets designed to reduce costs, support customers and promote its brands, opening up new markets in a sustainable way. To achieve tangible results the company has put in place a clear track record of improving eco-efficiency performance in the areas of water, waste and CO_2 from energy. On their website the overall approach to improving the eco-efficiency of manufacturing operations is described; it covers their eco-efficiency strategy, approach to data collection, and target-setting. It also includes a summary of performance across key performance indicators, as well as the environmental management system that underpins the company approach. In 2011 100 per cent of the electricity purchased for Unilever sites in Europe and Canada came from renewable sources.

For more information, see: http://www.unilever.com/sustainable-living/

The graph below shows "the channels along which a business strategy for eco-efficiency can help decoupling between use of natural resources and growth in an economy. It also shows how policy measures can amplify the effectiveness of these channels."[17]



Source: WBCSD

Cleaner production

In 1991, the United Nations Environment Programme (UNEP) developed the following definition of cleaner production (CP) which is still commonly quoted: "the continuous application of an integrated preventative environmental strategy to processes, products and services to increase efficiency and reduce risks to humans and the environment".[18]

Governments have promoted a change of rationale in industry through regulations,

17 http://www.wbcsd.org/web/publications/eco_efficiency_creating_more_value.pdf
18 http://www.unido.org/en/what-we-do/environment/resource-efficient-and-low-carbon-industrial-production/cp/cleaner-production.html

green taxes, and support schemes for cleaner technology. Self and voluntary commitments made by companies have also accelerated the introduction of sustainability as a key part of business strategy.

This has not only occurred in developed countries; it is also increasingly on the agenda in several developing countries. Since the mid-1990s, for example, cleaner production centres have been helping businesses in several African countries (Cape Verde, Egypt, Ethiopia, Kenya, Morocco, Mozambique, Rwanda, South Africa, Tunisia, Uganda, Tanzania and Zimbabwe) become more efficient with their resource and less polluting. The centres play a vital role through training, capacity-building, and demonstrating the economic and environmental benefits of sustainable production to the business community.[19]

UNEP-UNIDO's National Cleaner Production Centre

After the Earth Summit in Rio in 1992, the United Nations Industrial Development Organization (UNIDO) and the United Nations Environment Programme (UNEP) both set off to pilot preventive environmental strategies in key developing countries. On their successful completion, UNIDO and UNEP jointly launched a programme to establish National Cleaner Production Centres (NCPCs). The first batch of eight NCPCs was established in 1994-95.

With the main sources of support coming from the Governments of Switzerland and Austria with contributions from other donors (including Norway, Italy, Slovenia, Czech Republic, Spain, Denmark and the Netherlands) UNIDO and UNEP have expanded the Programme to 47 developing and transition countries. In each of these countries national experts have been trained, in-plant CP assessments completed and results and experience disseminated among enterprises, governments, business and professional associations as well as Civil Society.

To know more and access information on company best practices, please visit: http://www.greenindustryplatform.org/

19 UNEP 2012, 96.

Several complementary CP techniques or practices are possible, ranging from low-cost or even no-cost solutions to high-investment, advanced clean technologies. A common basis for CP implementation in developing countries includes:

1. **Good Housekeeping**: appropriate provisions to prevent leaks and spills and to achieve proper, standardized operational and maintenance procedures and practices.
2. **Input Material Change**: replacement of hazardous or non-renewable inputs by less hazardous or renewable materials or by materials with a longer service life.
3. **Better Process Control**: modification of working procedures, machine instructions and process record keeping for operating the processes at higher efficiency and lower rates of waste and emission generation.
4. **Equipment Modification**: modification of production equipment in order to run the processes at higher efficiency and lower rates of waste and emission generation.
5. **Technology Change**: replacement of the technology, processing sequence and/or synthesis pathway to minimize the rates of waste and emission generation during production.
6. **On-Site Recovery/Reuse**: reuse of the wasted materials in the same process or for another useful application within the company.
7. **Production of Useful By-Products**: transformation of previously discarded wastes into materials that can be reused or recycled for another application outside the company.
8. **Product Modification**: modification of product characteristics to minimize the environmental impacts of the product during or after its use (disposal) or to minimize the environmental impacts of its production.

Sustainable business through cleaner production

Kotowa, a Panamanian coffee producer, is an example of a business that has accrued resource savings through cleaner production. The firm has (i) stopped using chemical pesticides and herbicides in coffee cultivation, (ii) invested in development of new products such as organic coffee, (iii) converted 300 tonnes of waste coffee pulp into organic fertilizer, and (iv) switched from water-based systems for separation, transport and fermentation to dry systems, reducing water consumption from 30 litre/kg to less than 1 litre/kg of dry coffee. In 2006 Kotowa was awarded the annual prize for the cleanest industry by the National Environmental Authority in Panama. Thus the efforts toward cleaner production have resulted in resource savings as well as public recognition, possibly further enhancing the company's competitiveness (UNEP 2012b, 141).

A potential weakness occurs when cleaner technology is seen as a single solution – a 'one-shot' innovation activity – in the company. Seeing cleaner technology as a continuous improvement process inside industries can address this weakness. At the same time it is evident that new incentives and framework conditions are needed, if the companies are to implement more radical innovations of new processes and products. A means of securing continuous improvements in environmental performance is to implement an **environmental management system (EMS)**, as discussed below and in chapter 3.2.

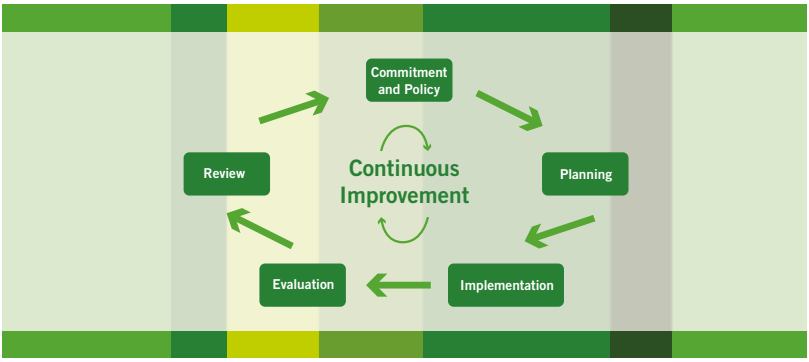
Environmental Management System (EMS)

An EMS helps a company address its environmental regulatory demands in a systematic and cost-effective manner. This proactive approach can help reduce the risk of non-compliance and improve health and safety practices for employees and the public. An EMS can also help address non-regulated issues such as energy conservation, and can promote stronger operational control and employee stewardship.

An EMS encourages a company to continuously improve its environmental performance. It should be anchored in a combination of principles and values. Although each company's EMS is tailored to the company's business and goals, its basic elements include:

- Reviewing the company's environmental goals
- Analyzing its environmental impacts and legal requirements
- Setting environmental objectives and targets to reduce environmental impacts and comply with legal requirements
- Establishing programs to meet these objectives and targets
- Monitoring and measuring progress in achieving the objectives
- Ensuring employees' environmental awareness and competence
- Reviewing progress of the EMS and making improvements

This requires commitment from the management as well as the participation of employees.



Front-runner companies that have an EMS are committed to going beyond compliance with environmental regulations. They also make continuous improvements to their environmental performance in line with ISO 14001.

ISO 14001

ISO 14001 is the best-known and applied environmental certification system.[20] Rather than focusing on the life-cycle of the products, ISO 14001 sets out the criteria for an environmental management system (EMS). It does not state requirements for environmental performance, but maps out a framework that a company or organization can follow to set up an effective EMS. ISO 14001 can be used by any organization regardless of its activity or sector and can help provide assurances to company management and employees as well as external stakeholders that environmental impact is being measured and improved. Some benefits for companies include: reduced cost of waste management; savings in consumption of energy and materials; lower distribution costs; and improved corporate image among regulators, customers and the public (ISO, undated).[21]

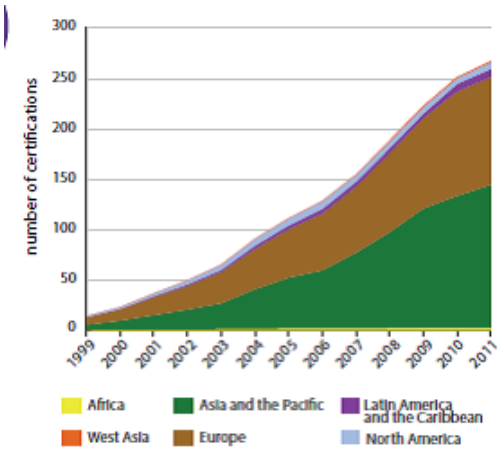


Figure 21: Number of ISO 14001 environmental management certifications, 1999-2011. ISO 14001 certification indicates that companies and other organization are committed to adopt environmental management systems in terms of conforming to their own stated policies. Total certifications surpassed 250 000 in 2010, with the highest shares in Asia and the Pacific and Europe. *Source: ISO (2012)*

20 The EU Eco-Management and Audit Scheme (EMAS) is another example of certification system.
21 UNEP YEAR BOOK 2013 "Emerging Issues in our Global Environment".

In 1997 IBM became the world's first major multinational to have earned a single worldwide registration to the ISO 14001 Environmental Management System (EMS) standard. IBM operations could potentially impact on the environment in a number of ways. Chemicals needed for research, development, manufacturing processes and services must be properly managed, from purchase through storage, use and disposal. Certain processes are energy- or water-intensive. In addition, IBM products should be designed so that they can be reused, recycled or disposed of properly at the end of their useful lives. To identify and effectively manage the potential environmental impact of IBM's operations, IBM established and has maintained a strong worldwide EMS for decades.

For more information, see: http://www.ibm.com/ibm/environment/ems/

Sustainable supply chain management

Following the eco-efficiency and cleaner production approaches, it is possible to improve the environmental performance not just of an enterprise, but of an entire sector through a value chain approach, by considering all activities that a good or service requires from its conception to its delivery.[22] Eco-efficiency and cleaner production thus provides the conceptual foundation for other organizational strategies aimed at enhancing the environmental performance of enterprises, including through **pollution prevention** and **industrial ecology**.

Pollution prevention and industrial ecology

Pollution prevention. Pollution prevention involves reducing or eliminating waste at the source by modifying production processes, promoting the use of non-toxic or less-toxic substances, implementing conservation techniques, and reusing materials rather than putting them into the waste stream.

Industrial ecology. Industrial ecology is a science focusing on the shifting of traditional waste-producing industrial processes to closed-loop systems, where wastes become inputs for new processes. Industrial ecology searches more effective use of internal resources, or clustering with other industrial processes. It studies the redesign of manufacturing processes and business relationships to use less energy, reject less waste, and substitute non-polluting inputs instead of using more traditional chemical processes (UNEP, 2010).

22 De Gobbi, 2011.

Communication and cooperation between the partners involved will build connections between the supply chain and the value chain. Companies have understood that most of their consumption of resources, including energy, land and water, takes place down their supply chains and that much of this consumption is beset with inefficiency. However, driving resource efficiency through the supply chain remains far from straightforward; particularly in the case of secondary and tertiary suppliers, constraints on capital, skill, and managerial capacity often make it difficult to boost performance. There is also a risk that competitors can free-ride on any improved performance, which weakens the incentive to drive change.

Traditionally enterprises optimize the supply chain in terms of, for example, tracking flows of information, materials and funds, and the logistics of supply and distribution. However, working environmentally with suppliers and supply chain issues is rapidly increasing as an important strategic consideration. Firms are increasingly requesting information from suppliers on materials used in their production and other systems in order to track and manage their environmental impacts. The leading companies in supply chains can support the performance of upstream and downstream enterprises by collaborating on programmes, strategies, tools, and so forth. An understanding of environmental impacts through the supply chain can therefore extend into other parts of the organization, leading to a more comprehensive and integrated life-cycle management approach.

Sustainable supply chain management (SSCM) harnesses market forces to amplify demand from end-users for more sustainably-produced goods from producers up the supply chain. Nowadays it is widely understood that a company is no more sustainable than its supply chain, and similarly that while enterprises can use relationships with suppliers to ensure reliable streams of process inputs at competitive prices, they also can influence the sustainability of their suppliers. Recent and growing interest in the sustainability of products across their entire life-cycle has also resulted in a more expansive view on SSCM, particularly among producers of goods for consumer retail sale. By working 'upstream' (with a company's suppliers) and 'downstream' (with a company's clients) a company can widen its outreach. Consequently SSCM has grown beyond its original focus on upstream suppliers to encompass broader issues that include transportation and packaging of products as well as disposal, and now includes initiatives from a number of producers to promote reuse and recycling through product take-back processes.

A **significant barrier** to increasing demand for sustainable products is cost. While much effort goes into making sustainably-produced products more cost-competitive, it is often the case that sustainably-produced products cost more than less sustainably-produced products, and demand for sustainably-produced products must therefore presuppose a willingness by customers to pay a 'sustainability premium' that reflects the added value conveyed by such products. A lack of customer awareness and a consequent reluctance to pay more for sustainably-produced goods requires raising the level of awareness of the additional value that

sustainably-produced goods provide. Consumer pressure creates an incentive – a pull factor – for businesses to work with environmental standards throughout their value chain. Enhanced consumer awareness can result in demands for higher environmental standards as well as acceptance of a price increase for the given product or service.

Green value chain development

An increasing number of mostly large businesses are finding that the benefits of value chain greening exceed its cost in terms of compliance with environmental regulations, enhanced supply chain communication and collaboration, and strengthened customer loyalty. The **UK-based retailer Tesco** is one such business. With the establishment of the Tesco Knowledge Hub, the company facilitates large-scale supply chain sustainability collaboration with its 630-plus suppliers from across the globe. Launched in 2010, the Tesco Knowledge Hub helps reduce the energy costs, waste and environmental impacts of the products. Tesco's purchasing policy includes setting of guidelines and provision of guidance on how the environmental sustainability of the suppliers can be enhanced. The company's aim is to cut carbon emissions from the company's supply chain by 30 per cent by 2020 in comparison with 2006-07 levels (Tesco 2013).

The **US supermarket chain, Wal-Mart,** is another large company that has initiated a large-scale greening of its supply chain. The retailer has asked its 100,000-plus suppliers to reduce 20 million metric tonnes of greenhouse gas emissions by the end of 2015. Wal-Mart is working with all levels of the supply chain to help suppliers assess and track emissions through quality assurance checks (Carbonfund 2010).

In **Argentina** the **Techint Group**, an important holding operating in the steel industry as well as in infrastructure and the energy sector among others, developed in 2002 **the ProPyMes Programme** (http://www.programapropymes.com) to promote the sustainable development of their SME customers and suppliers. ProPymes focuses its action on SMEs from the engineering sector, which directly impacts on the development of Argentina's industrial sector, and of small and medium oil service companies.

The Programme's objectives are to:

1. achieve improvements in the management of SMEs;
2. promote their investments in production;
3. promote their export capacity; and
4. promote efficient import-substitution products.

ProPymes provides special support in five areas: industrial management, human resources and education, financial management, commercial management, and institutional management. The SMEs participating in the programme have industrial and growth vocation. They are selected according to their potential export profile, the quality of their production and the sustainable vision of their management.

Life-cycle thinking

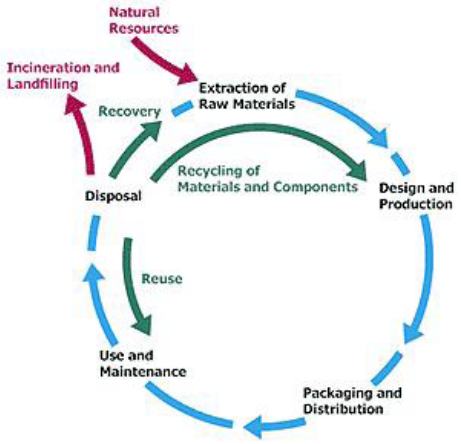
Life-cycle thinking is a production and consumption strategy that aims to account for all of the cumulative impacts (environmental, economic and social) that a product or service will have throughout its entire life-cycle, "from cradle to grave".

The life-cycle of a product includes:[23]

- Extraction of raw materials
- Design and production (manufacturing)
- Packaging and distribution
- Use and maintenance (consumption)
- End of life: reuse, recycling or disposal

Businesses engaged in life-cycle thinking work to assess and cost the various impacts with a view to reducing resource use and emissions and improving the performance of a product or service across its life-cycle. Concerned businesses can thus strengthen links between the economic, social and environmental dimensions ,both within their organization and throughout their entire value chain.

Each life-cycle stage has the potential to reduce resource consumption and improve the performance of products



23 UNEP and SETAC Life Cycle Initiative: http://www.lifecycleinitiative.org

The Life Cycle Initiative

The United Nations Environment Programme (UNEP) and the Society for Environmental Toxicology and Chemistry (SETAC) launched in 2002 an International Life Cycle Partnership, known as the Life Cycle Initiative (LCI), to enable users around the world to put life-cycle thinking into effective practice. The Initiative responds the call by governments around the world for a life-cycle economy in the Malmö Declaration (2000). It contributes to the 10-Year Framework of Programmes to promote sustainable consumption and production patterns, as requested at the World Summit on Sustainable Developement (WSSD) in Johannesburg (2002). It aims to promote life-cycle thinking globally and facilitate the exchange of knowledge of over 2,000 experts worldwide and four regional networks from different continents.

Useful resources and case studies are available on the website:
http://www.lifecycleinitiative.org

Source: UNEP and SETAC.

In line with this strategy, businesses can quantify the environmental costs of their operations using what is known as **life-cycle assessment** (LCA) which aids understanding of the environmental impacts of goods and services through all stages of production and consumption.

The environmental management standard ISO 14040 provides guidance on methodology. Rather than focusing on one aspect of improving the sustainability of a product or service, LCA examines the overall environmental footprint. Beyond LCA a broader concept of Life-cycle Management or Life-cycle Economy has been promoted for product development. It puts life-cycle thinking into business practice, involving other departments such as marketing and procurement, and seeking new sustainable business opportunities. Some companies in traditional industries are making efforts to transform themselves into more sustainable business models. For example, many manufacturers of electrical appliances are now striving to produce products that consume as little electricity as possible, because the use of electricity as it takes place in the user-phase will have the strongest environmental impact of the whole life cycle of the appliance. Through cross-sectoral planning and collaboration, companies help their downstream clients identify more or better uses for their products and services.

Life-cycle assessment is a critical tool that can be used to support regulatory approaches and measures for promoting environmental stewardship across the value chain, such as through **extended producer responsibility (EPR)**.

Extended producer responsibility

Extended producer responsibility denotes the way in which producers take responsibility for their products from cradle to grave. When producers are responsible for the whole value chain they will feel the need to develop products that have improved environmental performance throughout all stages of their life-cycle.

EPR encourages producers to address sustainable management at all stages of a product's life-cycle, especially for take-back, recycling and final disposal, thereby internalizing environmental or social costs.

In this regard it is important to note that both life-cycle assessment and extended producer responsibility are complex methodologies, very hard to effectively implement. Sometimes initiatives based on LCA and EPR may be seen as barriers to commerce, especially for emerging and developing economies. International commerce discussions aside, these concepts need to be taken into consideration by companies in all countries as they can become upcoming expectations and demands by market and society.

Circular economy

The concept of circular economy first gained ground in the business community in the late 1970s, when its application to modern economic systems and industrial processes became apparent. "[The] circular economy refers to an industrial economy that is restorative by intention; aims to rely on renewable energy; minimises, tracks, and hopefully eliminates the use of toxic chemicals; and eradicates waste through careful design. The term goes beyond the mechanics of production and consumption of goods and services, in the areas that it seeks to redefine (examples include rebuilding capital including social and natural, and the shift from consumer to user). The concept of circular economy is grounded in the study of non-linear, particularly living systems."

The circular economy is an approach in which material waste is removed and the energy components embedded in products are conserved, reused, and disassembled so that they can be recovered. Potentially, materials can eventually be recycled into a raw material for use in the manufacture of new products or, for specific categories of materials, returned to the economic cycle in the form of recovered energy.

China's circular economy approach is designed for interlinked manufacturing and service businesses seeking to enhance economic and environmental performance by collaborating in managing environmental and resource aspects.

By working together the business community can achieve a major increase in resource efficiency through industrial symbiosis. Similarly, industrial ecology offers an innovative solution to increasing energy and resource efficiency through an exchange of materials and energy between different industrial sectors and processes. The waste from one sector or process can be the feedstock for another. A number of eco-industrial parks in China are based on this new industrial model.

The idea of a circular economy as opposed to a linear one is not new, although it has gained significant ground through comprehensive investigation of the possible benefits in the current global economic climate by the Ellen MacArthur Foundation.[24]

These ideas are gaining increased influence and the businesses that stay at the forefront of such developments by adopting these – or similar – strategies are likely to reap significant benefits in terms of competitive advantage. Not only will such businesses save resources on waste handling and purchase of raw materials (for example through ensuring that they retrieve their products at the end of their lives), but by keeping abreast of environmental legislation or even exceeding its requirements they also avoid unpleasant surprises when new legislation comes into force.

Philips' approach on Circular Economy

"In June 2013, Philips has become a strategic partner of the Ellen MacArthur Foundation. Following the partnership, a two year project plan on Circular Economy has been established to embed the concept in the relevant businesses, building from the existing knowledge of the Philips Healthcare refurbishment business and the recycling activities from Lighting and Consumer Lifestyle. From economic point of view, embedding the Circular Economy concept promises additional value creation potential across Philips value chains."

Source: http://www.philips.com/about/sustainability/

Towards sustainable consumption and production

All the concepts presented so far form the basis for holistic and social forms of environmental protection and management that require a significant change of mind-set for both producers and consumers.

The goal of Sustainable Consumption and Production (SCP) is to decouple economic growth from environmental degradation by ensuring that the environmental impact

24 Ellen MacArthur Foundation 2012.

of all parts of the production process is at a minimum and that consumption patterns change from a throw-away culture to one of Reduce, Reuse, Recycle (3R).

The concepts of sustainable consumption and sustainable production emerged separately during the 1960s. Sustainable or clean production was initially focusing on proper disposal of products at the end of their lives, but was expanded during the 1970s and 1980s to include on-site waste treatment and waste minimization (recycling). From the early 2000s the concept grew to include green design and life-cycle manufacturing. Similarly, the sustainable consumption concept was expanded to include product life-cycle considerations, consumers as agents, and business partnerships for life-cycle-wide solutions.

Today the two concepts are combined into the comprehensive SCP concept, which is being applied in a wide range of forms and settings, such as multilateral environmental agreements; national strategies; market, regulatory and voluntary tools at multiple government levels; and a broad range of business and civil society initiatives.

Many countries have implemented – or are in the process of implementing – sustainable development strategies that refer explicitly to SCP and in which businesses play a crucial part through their role as major polluters. Examples of regulatory tools include environmental taxes – for example a 50 per cent tax deduction on environmentally-friendly hybrid cars imported into Jordan, and chemical regulations – for example the EU's REACH directive. However, since government-initiated regulations and programmes do not adequately ensure sustainable production patterns, business initiatives become increasingly important.

Business has dual roles to play in leading SCP innovations – both as a producer and as a consumer. Technological innovations and eco-design, including resource productivity and efficiency initiatives, are the major driving forces for internalizing environmental costs without compromising company competitiveness. As large organizational consumers, progressive companies are adopting innovative SCP measures into their business plans. New opportunities unfold as large corporate buyers start to adopt a more proactive mode. Innovation is not limited to the R&D of large companies; many innovations have also been introduced to the market through SMEs. Asia Eco-Design Electronics (AEDE) is an important project working with SMEs in the electronics supply chain and with partners in China, India and Thailand to improve their response to customers, legislation and waste issues.

Complying with regulations, joining voluntary schemes and introducing innovative and sustainable solutions to environmental issues all translate into competitive advantages for businesses. This will become increasingly true as governments continue to introduce higher environmental standards and consumers continue to demand products and services with low environmental impact.

Green Purchasing Network

In Japan, the Green Purchasing Network (GPN-J) is an attempt to bridge the gap between supply and demand. The network was established in 1996 by the Environmental Agency in collaboration with a range of stakeholders including consumers, businesses and government organizations. It promotes many innovative initiatives and activities. As of June 2009 GPN-J had more than 3,000 members. The network, the goal of which is to promote green purchasing, is based on four major principles: (i) consider necessity before purchasing; (ii) note the environmental impact of a product at all stages of its life-cycle; (iii) consider corporations' and distributors' environmental performance; (iv) gather environmental information when purchasing products.[25]

The network has developed a database on which 11,000 products have been assessed, based on the network's purchasing guidelines. The efforts of the network have been supported by the Ministry of Environment's Law on Promoting Green Purchasing since 2000, which requires government agencies to purchase environmentally-friendly products. In addition to providing information on green purchasing and facilitating a forum in which consumers, businesses and government organizations can communicate, the network also runs training courses six to eight times a year for purchasing officers in the government, in order to disseminate purchasing principles as well as the Law on Promoting Green Purchasing.

Other educational activities include promoting green purchasing criteria to companies and product developers; international networking to share best practice; and working to raise consumer awareness of the availability of green products. The Law on Promoting Green Purchasing has been quite effective in that many companies have improved their products to meet the purchasing guidelines criteria. This has helped expand the market for environmentally-friendly products, which in turn has made it easier for the consumer to purchase green products. Overall the mandating of governmental green purchasing has been key to ensuring the long-term effectiveness of the GPN-J project.[26]

Gradual steady pressure from the public sector along with extensive cooperation between the public and private sectors will drive the green market forward.

25 GPN-J 2006.
26 UNEP 2012b, 120.

Eco-innovation

Eco-innovation is a broad concept that can effectively comprise many of the above discussed approaches and methods. The Eco-Innovation Observatory (EIO)[27] defines eco-innovation as, "*the introduction of any new or significantly improved product (good or service), process, organizational change or marketing solution that reduces the use of natural resources (including materials, energy, water and land) and decreases the release of harmful substances across the whole life-cycle*".

All types of innovation can become eco-innovation if their environmental benefits can be demonstrated. Eco-innovation is not limited to a sector or a mere synonym for environmental technologies, goods or services, rather, it is cross-cutting. The framework for the analysis of the eco-innovations builds on the widely applied innovations classification of the OECD,[28] including product, process, marketing and organizational types of innovation. Yet, it goes beyond it, including material flow innovation and social and systems eco-innovation that have wider change with systemic implications for economy and society (e.g. new urban designs, new mobility systems, new production-consumption models based on services).

According to OECD, what makes eco-innovation distinct from any other types of innovation is that it results in the mitigation of environmental impact, whether the effect is intended or not. Furthermore, its scope may transcend the traditional structural limitations of the innovating organization, thus involving broader social arrangements that could spur socio-cultural and institutional changes.

In the context of greening business, eco-innovation can come in forms such as improving resource and energy efficiency of processes, technologies, services; switching to greener products production; upgrading to cleaner technologies and processes; introducing smaller circular schemes for waste and heat recycling; joining the symbiotic networks where waste of one company can be a resource for another; changing business models from product selling to service offering (e.g. renting, sharing, repairing), among others.

27 See the Eco-innovation Observatory (EIO) platform and resources at www.eco-innovation.eu. The methodological report provides a definition of the concepts and is available at www.eco-innovation.com/reports

28 OECD (2009) Sustainable Manufacturing and Eco-Innovation. Synthesis Report http://www.oecd.org/sti/innovationinsciencetechnologyandindustry/greengrowthandeco-innovation.htm

Examples of different types of eco-innovation for greening

Process eco-innovation: improving energy efficiency at water treatment plants

Perceptive Engineering Ltd (UK) developed a new real time monitoring and management system of water treatment process. Its WaterMV system at a water treatment works in North West England demonstrated a 25-35% energy saving. WaterMV is a multi-variate model predictive control solution, which enables the operation of a water treatment plant at its optimum efficiency by learning what is efficient and continually monitoring the parameters used to define that situation, using the feedback to adjust inputs as required.

Marketing eco-innovation: green brands

Globe Hope Ltd (Finland) has developed a "green brand" by designing fashionable clothes and positioning itself as an alternative to a fast-paced textile industry. Globe Hope Ltd. uses recycled materials to design and produce new clothes and accessories. The materials used include hospital and army textiles, worker uniforms, advertisement banners, flags, recycled sails, seatbelts and vintage home textiles (e.g. sheets, curtains, and tablecloths). The mission of the company is to offer customers an ecological and sustainable choice and encourage them to move to a more sustainable lifestyle and way of thinking.

Systems eco-innovation: Industrial symbosis

An example for an industrial symbiosis network is in Kalundborg, Denmark. The Kalundborg Symbiosis began in 1961 and it was not created as a top-down initiative, but evolved gradually. Private and public enterprises buy and sell waste products from industrial production in a closed cycle. Residual products from one company are used as raw materials in another company, therefore the economy and the environment are benefiting. In Kalundborg a coal-fired power plant (1500 MW) is linked with other companies and the community. The surplus heat, which is not needed by the powerplant is used for heating about 3500 households nearby and a local fish farm. The sludge from the fish farm is sold as fertilizer. The power plant also produces useful steam, which is sold to Novo Nordisk (a pharmaceutical and enzyme manufacturer) and to a Statoil plant. Because of the reuse of heat, the thermal pollution emitted to a nearby fjord is reduced. A by-product of the coal power plant contains gypsum, which is sold to a wallboard manufacturer. Also the fly ash and the clinker which accumulate during the process in the power plant can be used for road building and cement production.

Source: EIO.

Eco-innovation provides opportunity for business expansion to reach new consumer segments, international markets and other value chains with new or modified products. For example, as illustrated in the examples below, the Specialized Solar Systems, an alternative energy company in South Africa has grown in size and is now

exporting to other countries. Their model is to provide renewable energy solutions that meet the rural population's demand for energy. The cosmetics manufacturer Natura in Brazil has doubled its sales by developing a new green product line.

Examples of eco-innovation as a means for developing countries to access new markets

Specialized Solar Systems (SSS) brings electricity to rural communities

The alternative energy company, SSS, is a small business start-up that has tripled in size in three years and expanded its business operations to four other countries in the region. Its business strategy is to provide renewable energy solutions to meet the market demand of rural communities in Africa with limited or no energy access. The company also aims to change the norms in consumption patterns of electricity. In rural South Africa, electricity supply is often not connected to Alternating Current (AC) based infrastructure. SSS deploys microgrid kits fed by solar power and modifies home appliances to use Direct Current (DC) which consumes two-thirds less energy than conversion to AC systems. The microgrid kit was designed to minimize impacts along its life-cycle, and the modular base specific components to be replaced without having to reinstall the entire system. In addition, the panels are effective for 20 years. The kit is sold as a service-system which can be managed remotely through a web-based smart box. SSS also provides free training to ensure direct local maintenance. Through a partnership with local government and technical research institutions, SSS gained additional funding and technical support which enabled it to roll out this model of energy supply to a critical mass. *(Case study based on interview with Mr. Carlos Smith, Specialized Solar Systems, South Africa)*

Natura reaches a new market with bath and body products

In Brazil, the cosmetics firm Natura has a market share of over 20 per cent with an average annual growth of 26 per cent in 2005-2010. The company has practically doubled in size from 2007 to 2011. Its business strategy is based on innovation for sustainability and market differentiation. Through its innovations in the body and bath care product line SOU, Natura proposed a new product to consumers. It was designed with the aim of reducing impacts along its life cycle by innovating the ingredients formula, the packaging along the supply chain. Less material was used, and manufacturing time as well as transportation were improved and optimized. Natura was therefore able to expand sales in a new market segment, with a price point lower by 20–40 per cent compared to other product lines from Natura. The new product line was well received by consumers, and after a six-month successful trial period, it was launched throughout Brazil. *(Case study based on interview with Fabien Brones, Scientific Manager Eco-design and Environmental Impacts, Natura)*

Source: UNEP 2014, The Business Case for Eco-innovation.

3.2.2 Green business creation

Green business creation can refer to both the creation of new enterprises that deliver green goods and services, and business diversification within existing enterprises to tap into rapidly growing green market opportunities.

Green business creation is driven by consumer awareness, demand for eco-friendly products and various multinational requirements along the supply chain. Other key drivers are governmental regulations and levies such as bans on certain materials, and the introduction of feed-in tariffs or energy-efficient standards. At the same time, a green business start-up can simply result of an increased environmental awareness among business leaders and entrepreneurs. In emerging economies and developing countries there is ample scope for application of new technologies for more efficient, cleaner and greener products and services. Coupled with innovation and stimulating start-ups in untapped green market segments, these drivers are already having a significant impact on job creation and poverty alleviation.

The concepts of **'green entrepreneurship'** need to be defined in order to become operational in a business context.

According to the ILO and the OECD, green entrepreneurship can be defined from two perspectives related to the output (products and services) as well as the process (or production) of an economic activity. Entrepreneurs can enter into an overtly 'green' business sector, providing green and environmentally-friendly products and services (for example eco-tourism). Alternately, green entrepreneurs can provide their products or services through an environmentally-friendly process or with the help of clean technologies (for example waste management). Usually, green entrepreneurs consider both aspects in their business models, creating additional decent employment through the use of more environmentally friendly processes, while reducing the overall environmental impact as a result of people or companies using the final product or service.[29] Some authors also incorporate ethical, social, or environmental motivations in their definitions of green entrepreneurial activity.[30]

A business can exercise green entrepreneurship by developing eco-innovative products or services or amending its business strategies so as to focus on sustainability. A new product or service can work either as an addition to existing production (i.e. a green production line) or as a foundation for the entire production process (for example by establishing a new business based on high environmental standards or by shifting entirely to the production of green products).

29 Source: http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/publication/wcms_250688.pdf
30 OECD 2011.

Examples of eco-innovation

The **Danish SME, EcoXpac**, is an example of an enterprise based on an eco-innovative concept. EcoXpac produces customized protective packaging using 100 per cent biodegradable moulded fibres based on cellulosic elements from organic materials (for example wood, straw and bamboo). In recent years the company has expanded its production to include items such as milk cartons and waterproof single-use vases (for hospitals), and also from biodegradable moulded fibres. Currently EcoXpac is looking into the possibility of creating a green fibre bottle made from paper pulp and able either to enter into recycling systems on equal terms with cardboard and paper or else decompose directly in nature (EcoXpac, undated).

The **American building material manufacturer, 3form**, is an example of an enterprise developing green products alongside "conventional" products. Along with a wide range of building supplies with varying degrees of environmental significance, the company launched a material made entirely from post-consumer recycled HDPE (3form, undated).

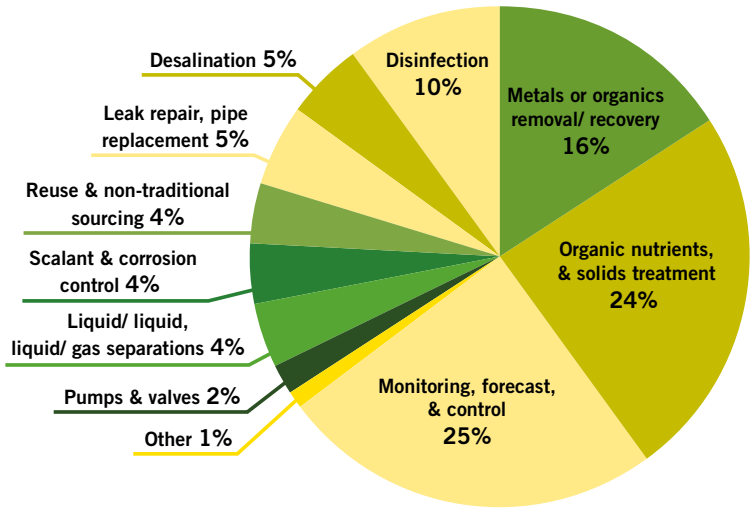
Clean-tech and eco-industries are a growing economic sector where many start-ups find business opportunities. According to figures from consultancy firm Frost & Sullivan,[31] the market for clean technology was worth $601bn in 2014. By 2020, the firm predicts this will expand to $1.3tn. Demand for green technologies based on wind, solar and biomass power, smart grids, storage, electric vehicles and efficiency has been rapidly increasing. According to the experts forecasts, *resource scarcity, energy security concerns, population growth and increasing consumption, by expanding middle classes in emerging markets, will continue to drive this clean-tech market growth.*

31 http://ww2.frost.com/

Startups Tapping the $600 Billion Cleantech Water Sector

A wave of startup companies is rising up to address the growing need for wastewater treatment and monitoring solutions, part of a $600 billion industry that has traditionally been dominated by legacy companies such as GE, Veolia, Siemens and Suez. What's more, the industry as a whole is generating average operating profits of 12.9%, reports Lux Research analyst Brent Giles in the firm's new analysis, "Making Money in the Water Industry." The report analyzes financial data from more than 150 large companies and activity involving 150 startups, across nine different sectors including wastewater monitoring and control, basic wastewater treatment, metals and organics recovery, and disinfection. The Lux Research report suggests that almost one-quarter of all the new companies targeting this space are focused on monitoring, forecasts and process controls (through sensors and Internet of Things applications); roughly the same number is addressing basic wastewater treatment. The graphic below offers a more detailed visualization of the sector breakdown (based on the number of companies targeting each space).

Startup Technology Types



Source: Forbes, 2014: http://www.forbes.com/sites/heatherclancy/2014/01/22/9-startups-tapping-the-600-billion-cleantech-water-sector/

Initiating a new business based on a **green or sustainable business models** is another strategy entrepreneurs can look into. New enterprises do not necessarily need to rely on novel technologies and products. New trend of green business models rather suggest to deliver value to customers differently, such as not via selling the product, but selling the value this product can offer.

According to Bocken et al. (2014) a business model is defined by three main elements: the value proposition – product/service, customer segments and relations; value creation – key activities, resources, channels, partners, technology; and delivery and value capture- cost structure and revenue streams.

"Sustainable business models incorporate a triple bottom line approach and consider a wide range of stakeholder interests, including environment and society. They are important in driving and implementing corporate innovation for sustainability, can help embed sustainability into business purpose and processes, and serve as a key driver to competitive advantage".[32]

"By replacing old business practices, innovative business models also allow firms to restructure their value chain and generate new types of producer-consumer relationships, and alter the consumption culture and use practices. The business model perspective is therefore particularly relevant to radical and systemic eco-innovation, including how business models and strategies can induce and help diffuse radical eco-innovation and enable systemic changes and transformation. Moreover, it is important to understand better how policy can influence and facilitate the emergence of new business models that are effective in driven eco-innovation."[33]

The Bocken et al. and Boons and Lüdeke-Freund proposed a categorisation of sustainable business models into 3 higher groupings:

- Technological Innovation – this includes all market devices that help overcome internal and external barriers in marketing clean technologies; the business model's ability to create a fit between technology characteristics and (new) commercialisation approaches that both can succeed on given and new markets is its most relevant feature[34] (p.14). The three archetypes include:
  - Maximise material and energy efficiency
  - Substitute with renewables and natural processes
  - Create value from 'waste'

32 Bocken et al., 2014, p.42.
33 OECD/European Commission/Nordic Innovation, 2012, *The Future of Eco-Innovation: The Role of Business Models in Green Transformation*, Background Paper on progress of the OECD project on Green Growth and Eco-Innovation, published for a joint workshop that took place in 19-20 January 2012, Copenhagen, Denmark.
34 Boons and Lüdeke-Freund, 2013.

- Social innovation – it enables social entrepreneurs to create social value and maximise social profit; of significance is the business model's ability to act as market device that helps in creating and further developing markets for innovation with a social purpose (p.16). The three archetypes include:
  - Deliver functionality, rather than ownership
  - Adopt a stewardship role
  - Encourage sufficiency

- Organizational innovation – it is about the implementation of alternative paradigms other than the neoclassical economic worldviews to shape culture, structure and routines of organizations and thus change the way of doing business towards sustainable development; a sustainable business model is the aggregate of these diverse organizational aspects (p.15). Its two archetypes include:
  - Re-purpose the business for society/environment
  - Develop scale-up-solution

Overall a business model for sustainability helps manage and communicate (i) a company's sustainable value position to its customers, and all other stakeholders, (ii) how it creates and delivers this value, (iii) and how it captures economic value while maintaining or regenerating natural, social, and economic capital beyond its organizational boundaries."[35] The keys to successful change in business practices are the business leadership, internal structural and cultural capabilities to achieve firm-level sustainability and the need to collaborate and create value to the stakeholders and the natural environment, beyond customers and shareholders.[36]

35 Schaltegger et al. 2015.
36 Stubbs and Cocklin, 2008.

Zen Car electric car sharing system

Car sharing has becomes a success business models that diffused in many countries. It promotes the car renting culture so that customers, in so far possible, do not need to own a car. By switching from a product to service oriented concept, car sharing potentially can have a large long term impact related to decreased material consumption.

In Belgium a particular success has been achieved by companies Zen Car, which is a new comer using only electric cars and Cambio, which has had a longer presence in Belgium.

Zen Car car sharing is a model of electric car rental where customers rent cars for short periods of time, often by the hour. The system is attractive to customers who make occasional use of a vehicle, as well as others who would like occasional access to a vehicle of a different type than they use day-to-day. Rather than promote the automobile, the service aims on giving it a limited and reasonable use. The system is simple: take or drop- off a car at any of several parking points in Brussels. Every user has a monthly subscription and an electronic card for a key. Every subscriber has the possibility of having a vehicle 24 hours a day and 7 days a week. The vehicles can be booked by customers via the internet or by telephone anytime.

Source: https://www.zencar.eu/en/

In recent years **Product-Service Systems (PSS)** have proved to enhance the business competitive advantage in a green market. PSS can be defined as a model combining physical goods and intangible services that satisfy specific customer needs.[37] This is a good model for developing competitiveness in a more sustainable way than by simply selling a product that only competes on price.[38] The concept of PSS is often used as a synonym for leasing arrangements. However the term covers a number of approaches characterized by various combinations of products and services. PSS can be divided into three main strategies focusing on the respective use, phase or function:

- **Product-focused PSS**, in which business models are mainly directed towards the sale of products, along with additional services such as guidance on such aspects as use, maintenance, spare parts, lifetime warranty and possibly take-back of the product.
- **Use-focused PSS**, in which the company leases a product to the customer, typically for a fixed charge. When clients no longer wish to use the product,

37 Tischner & Vezzoli 2002.
38 Tukker 2004.

they deliver it back to the company which can then either recycle it by leasing it to a new customer, re-use its components, or recycle the materials for the production of new products.

- **Function-focused PSS**, in which the company in a lease agreement provides a service to the customer equal to the function of the product, including related services such as maintenance and repairs and in some cases the resource consumption of the product.

Especially with use- and function-focused PSS, the potential for environmental and financial benefits is significant. The key idea is that, by using a service to meet customers' needs rather than a physical object, more needs can be met with lower material and energy requirements.

With use-focused PSS the business continues to own the product, giving it more or less complete control of end-of-life treatment. It makes financial sense to ensure that the product is circulated back into the production loop through re-use or recycling. In function-focused PSS the business has complete control of the processes involved in the service provided and can thereby ensure, for example, low energy consumption throughout the utilization of the service, ensuring its durability via maintenance and repair. Rather than focusing on selling as many units as possible, as is the case in traditional product-oriented business foundations, the use- and function-focused PSS encourage businesses to enhance the quality and prolong the lifetime of their products. PSS models are seen as an important element of circular economies due to their reliance of product reuse, sharing, and focus on higher durability and reparability of the products.

The example below outlines the essential differences between product selling systems (traditional product sales) and PSS.

Traditional product sales	Innovative alternatives: Product-Service Systems	
Consumer buys a washing machine to clean clothes in-house/hotel.	Consumer rents a washing machine to clean clothes inhouse/hotel	Client buys a service from a company (laundry) to clean cloths (Company determines best equipment and methods based on client's needs).
Client owns, uses and stores washing machine. Consumer is responsible for maintenance and the 'quality' of the cleaning.	Company retains ownership of washing machine and is responsible for maintenance. Client is responsible for use and 'quality' of cleaning.	Company owns, maintains and stores the cleaning equipment including washing machine. Company is responsible for quality' of the cleaning.'
Initial investment for consumer could be considerable.	Consumer costs are spread over time (they pay a low initial deposit and then pay per wash).	Consumer costs are spread over time (they pay per wash).
Consumer ultimately disposes of washing machine and buys replacement.	Company is responsible for disposal and has incentives to prolong use of product, reuse component and recycle materials.	Company is responsible for disposal and has incentives to prolong use of product, reuse component and recycle materials.

Source: UNEP, CIR.IS and IIIEE (2000).

Going beyond the technological implications and environmental benefits of the eco-innovation and green products, **the ILO promotes a systemic approach that also aims at boosting employment gains**. Besides the narrow technology-based aspects of doing business, green entrepreneurship can nurture a culture of life-cycle based thinking and stimulate green innovation at society level. By so doing green entrepreneurs create a shift in peoples' mindsets towards greener thinking and increased demand for green products and services, boosting the dual effect of employment and environmental gains.

Through promotion of green entrepreneurship the ILO aims to enable potential entrepreneurs, particularly youth, to develop sustainable business ideas and therefore promote the creation of green jobs and decent work, while defining practical business solutions to environmental challenges.

The ILO's approach to green entrepreneurship

The ILO systemic approach towards green entrepreneurship includes:

- Nurturing a (green) business culture and raising awareness among entrepreneurs of opportunities arising from environmentally friendly business models.
- Creating an enabling environment which promotes and encourages green investments and entrepreneurship.
- Supporting new and emerging entrepreneurs through provision of business development services and other financial and technical support schemes.

Examples of its application are provided below.

Green Youth Entrepreneurship East Africa

The Youth Entrepreneurship Facility (YEF) is a partnership between the Africa Commission, the Youth Employment Network (YEN) and the ILO. Implemented during the period 2010-2014 in Kenya, Uganda, and Tanzania, the partnership is funded by the Government of Denmark. The initiative is built on an approach to enterprise development based on: i) promoting a culture of entrepreneurship; ii) entrepreneurship education; iii) evidence-based advocacy; iv) youth-to-youth fund; v) access to business development services and finance.

The YEF programme has over the years been promoting **green entrepreneurship**. In 2010, YEF formed a partnership with the ILO's Green Jobs Programme in response to the identification of green jobs and green entrepreneurship as one of the key priorities during the initial national and local stakeholder consultations.

Among the most successful green entrepreneurs whose business start-up was supported by the YEF, the following have contributed with examples of how to apply the eco-innovation concept in three different economic sectors:

- Ms. Lorna Rutto is co-founder of Eco-Post Recycling Company in Kenya, which recycles plastic waste from dump sites and converts it into durable weather resistant decking boards and fencing posts. To date 40 direct and over 500 indirect jobs have been created to manufacture "plastic lumber" in eastern Nairobi. http://www.ecopost.co.ke/
- Mr. Caleb Wakhungu is a green business entrepreneur in the manufacturing of solar panels in Uganda, using locally-available material to produce nearly 80 per cent of the solar panels used by communities in rural areas. http://www.mt-elgonproject.org/solar.html
- Ms. Merabu Manige runs a business in Uganda which produces nutritional porridge and soup using locally grown mushrooms as a primary product, thereby adding value and making mushrooms attractive to local consumption.

Indonesian Green Entrepreneurship Program

Other public schemes focus on the establishment of new green businesses such as the Indonesian Green Entrepreneurship Program (IGEP), which seeks to promote green entrepreneurs in rural and urban areas in Indonesia, supporting the shift to a green economy with green jobs, decent work creation and a reduction in greenhouse gas emissions in several sectors of the economy. The programme aims to help Indonesian stakeholders develop an Indonesian-based toolkit on green entrepreneurship as well as providing capacity-building activities and the establishment of a national green entrepreneurship programme. The main activities and outcomes of the IGEP are described in a fact sheet published in August 2014 on the ILO website:

http://apgreenjobs.ilo.org/project/green-entrepreneurship-programme

The creativity and dynamism of SMEs in particular mean that they have a crucial role to play in the green economy, both as eco-innovators and as recipients of green technologies. However issues such as a lack of available financing, high innovation activity costs, and the perception that eco-innovations represent additional commercial risks, all need to be addressed to ensure that their creativity benefits the wider economy.

Because of both the uncertain nature of eco-innovation in terms of output and of most businesses' lack of experience with the concept, this is an area in which businesses can benefit greatly from an external support system involving governmental agencies, knowledge institutions or other businesses. Such support systems can provide knowledge and guidance, for example green technology transfer and how to promote research and development.

The exchange of knowledge and best practice between businesses can be very helpful for companies seeking innovative solutions and product development. Competition between businesses, however, is likely to make this process problematic. For this reason the role of government-supported initiatives is especially important in facilitating the eco-innovative processes.

3.3 Towards sustainable workplaces

3.3.1 Linking occupational safety and health and the environment at the workplace

Because their benefits are less tangible, the social and ethical dimensions of sustainability have to date not been given the same attention within the business community as the environmental dimension. However, examples of positive links exist between environmental improvements and health and safety improvements in the workplace. There is a general trend in companies and in governmental policies towards Integrated Management Systems, which include health and safety issues as well as other social aspects.

Businesses influence the health and safety of their employees at every stage of their product's life-cycles, from resource extraction to end-of-life disposal. Consequently, greening of industry not only benefits the environment but carries with it a real opportunity to improve working conditions and employee health.

The tools used internationally to assess and manage the risks chemicals present to human health have generally been developed independently of the tools used to assess risks to the environment. However following increased recognition of the need to protect both humans and the environment more effectively, an integrated approach to risk assessment that addresses holistically situations of multi-chemical, multimedia, multi-route, and multispecies exposures was developed by the International Programme on Chemical Safety (IPCS). The purpose of this programme has been to foster integration of approaches to evaluating human health and ecological risks.[39]

According to the World Health Organization (WHO), "workplace fatalities, injuries and illnesses remain at unacceptably high levels and involve an enormous and unnecessary health burden, suffering, and economic loss amounting to 4–5 per cent of GDP. According to WHO and ILO, there are 2.0 million work-related deaths per year. WHO estimates that only 10-15 per cent of workers have access to a basic standard of occupational health service. Only 5-10 per cent of workers in developing countries and 20-50 per cent of those in industrialized countries have access to adequate occupational health services. Poor working conditions result in a total of 300,000 work-related deaths and economic losses of 4 per cent of the gross domestic product of the European Region every year. There are many European countries where less than 10 per cent of the working population has access to occupational health services."[40]

Studies show that unintentional poisoning kills an estimated 355,000 people

39 WHO 2001, 1.
40 WHO 2000 in Wei and Meilin 2009.

globally each year.[41] In developing countries – where two-thirds of these deaths occur – such poisoning is associated strongly with excessive exposure to, and inappropriate use of, toxic chemicals. In many such settings toxic chemicals may be emitted directly into soil, air, and water – from industrial processes, pulp and paper plants, tanning operations, mining, and unsustainable forms of agriculture – at levels or rates well in excess of those tolerable to human health. Chemicals, waste, dust and certain emissions affect both human health and the environment, and in a sustainability perspective it thus becomes beneficial to focus on a joint approach to such issues.[42]

Using an Integrated Management System approach is one way in which businesses can start working on employee health and safety in relation to environmental issues. In some industries, such as construction and mining, it is generally recognized that integrated management systems are an effective tool for ensuring coherent integration of sound environmental and OSH systems in a worksite with multiple stakeholders.[43] An integrated management system allows a management team to create a single structure that can help effectively and efficiently deliver the business's objectives. Such a system could be based on an Occupational Health and Safety Management System (OSHMS), an Environmental Management System (EMS) such as ISO 14001, or a Quality Management System (QMS) such as ISO 9000.

The joint WHO-UNEP Health and Environment Linkages Initiative, HELI, offers a wide range of information on risks and best practice. Although aimed at policymakers, HELI can function as an initial introduction to the issues of employee health and safety and the environment for businesses that wish to improve their practices in this regard.[44]

41 WHO 2003.
42 WHO 2013a.
43 ILO 2011a.
44 WHO 2013b.

Examples of eco-innovation as a means for developing countries to access new markets

Greening of industries in the EU: Anticipating and managing the effects on quantity and quality of jobs

The transition to a green economy in the EU will transform work as businesses implement practices to reduce their contribution to climate change. To ensure a socially responsible transition towards high-quality green jobs, governments, employers and workers must anticipate and manage the greening process.

Eurofound – a tripartite European Union Agency – has recently published a vast selection of case studies on greening of industries in the EU based on 48 companies. This study provides an overview at sectoral and cross-sectoral level in the EU of the effects of greening on the quantity and quality of jobs in 10 sectors (namely automotive, chemicals, construction, distribution and trade, energy, furniture, non-metallic materials, shipbuilding, textiles and transport). It also analyses good practice examples of the anticipation and management of green change at company level in these sectors. It finds that the available evidence suggests that the impact of greening on jobs so far has been moderate, and that the greatest impact has been on skills development.

For more information, see the full report. A searchable database of case studies is also available.

Utenostrikotažas is a large textile producer in Lithuania with 780 employees. For more than a decade the company has been engaged in green business practices to improve its energy and resource efficiency. This case study illustrates how different types of green business practice in production facilities have different effects on employees. A thorough analysis focuses on the effects on employment of the automation of fabric dyeing processes and highlights the associated improvements in employee health and safety conditions, among other issues.

Source: Eurofound, 2013

Green jobs and occupational safety and health

Foresight on new and emerging risks associated with new technologies by 2020 – Report

This report describes the project 'Foresight of new and emerging risks to occupational safety and health associated with new technologies in green jobs by 2020', carried out for the European Agency for Safety and Health at Work (EU-OSHA). The outcome of the exercise is a set of scenarios covering a range of new technologies in green jobs and the impact they could have on workers' health and safety. They are intended to inform EU policymakers, Member States' governments, and trade unions and employers, so that they can take decisions to shape the future of occupational safety and health (OSH) in green jobs towards safer and healthier workplaces.

Full report available at: http://bookshop.europa.eu/en/green-jobs-and-occupational-safety-and-health-pbTER012003/?CatalogCategoryID=V_wKABstsBoAAAEjpJEY4e5L

3.3.2 Worker–employer dialogue and cooperation to achieve greener workplaces

A good worker–employer dialogue is necessary to ensure a high degree of flexibility and adaptability to new ideas and changes among workers. **When employers ensure thorough and rapid transmission of information and communicate openly about new processes and changes, the workers tend to feel more capable and less hesitant to participate in the process of greening the enterprise.** Active participation gives a type of "on-the-job training" for workers and enhances employee work morale, and thus has the potential to increase the quality and efficiency of the work done.[45] An education that enhances awareness of environmental and health and safety matters, and at the same time provides the management with knowledge of employees' ideas on possible business development, makes it easier to bring about and incorporate necessary changes.

The first stage of internal communication may be a large meeting during which all workers are informed about the process of greening the enterprise, and of what this greening will involve. When the work is in progress it is advisable to have a continuous and rapid flow of information on all important decisions, in order to counteract rumours and unsubstantiated expectations or fears. Informing and conducting dialogue with employees can be achieved in different ways: the responsible actors can contact individual workers and inform and discuss with them directly; they can arrange group discussions and staff meetings with management participation; or they can organize message boards and newsletters.

Good dialogue can facilitate important inputs from workers for the greening of the enterprise. **Usually the workers have the best and most detailed understanding of practices and procedures in the organization and can for example help identify important areas in production for management to investigate**. From their daily work they know about resource consumption, emissions, hazardous situations and impacts, and in many cases can also point to possible solutions. Research shows that employees are often key instigators of environmental initiatives in their workplaces. Such initiatives help strengthen the economy, reduce environmental impact and improve the general operation of businesses; however most businesses, have yet to utilize their employees' full potential.

45 Purcell and Georgiadis 2007.

Modulex – Denmark

Modulex is a Danish company with considerable experience in employee engagement and inclusion and has seen considerable benefits from more than ten years of working with enhanced worker-employer collaboration. Modulex is the world's leading provider of architectural signs and has approximately 120 employees. In 2001 the company established working groups among its employees with the purpose of initiating a collaborative process to enhance production processes, product quality, and health and safety measures. Utilizing a Team Idea Process (TIP) tool, the business has organized the idea-generation process and made it part of company culture. The process includes team meetings every other week when ideas and problems are presented and discussed. If management approves an idea, cross-departmental working groups are established and a team leader is appointed to get the project under way. Modulex rewards each good idea with a check for 5,000 DKR (approximately €670) that go towards joint events in the business. The TIP initiative has resulted in considerable improvements for Modulex, in terms of both employee motivation and profitability; after 100 initiated projects and an investment of approx. 915,000 DKR (approx. €122,700), the company has saved 1.8m DKR (approx. €241,400) through improvements (IBAM 2011, 36-38).

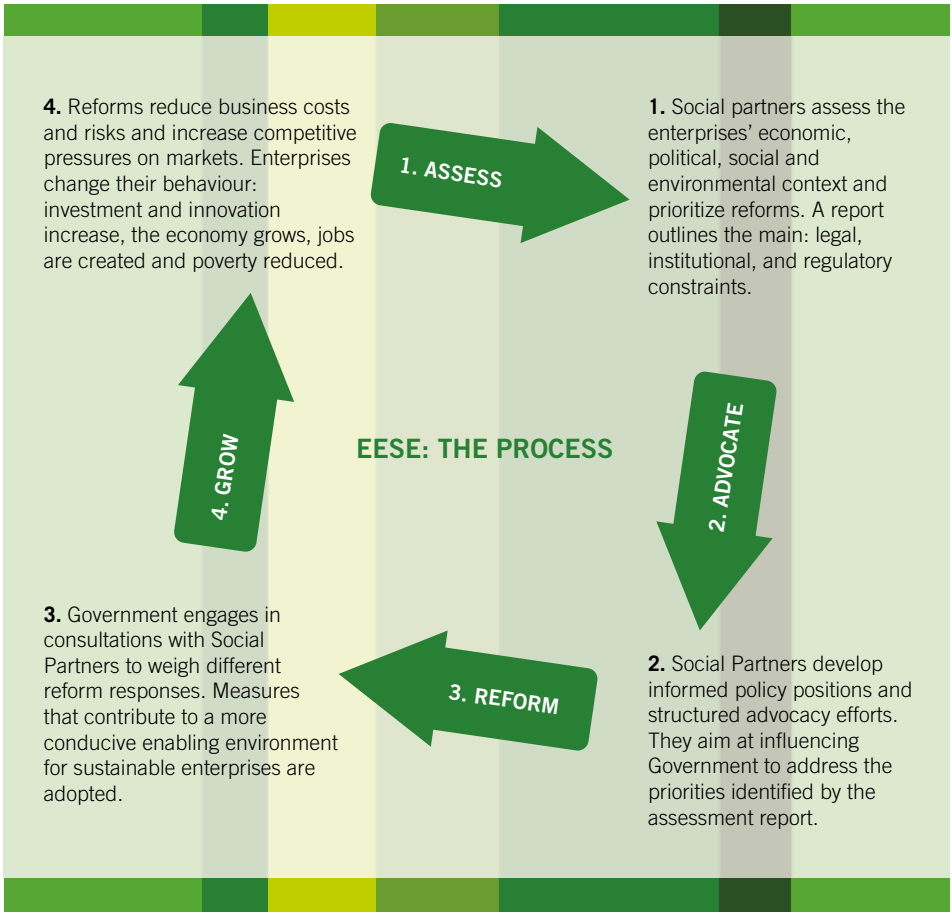
A Danish survey from 2009 showed that nearly 56 per cent of all Danish employees have ideas on how to reduce energy consumption in their workplaces, whereas only 17 per cent have been able to engage with the management on such issues.[46] Furthermore, studies show that employee initiative and creativity quickly deflates if management does not take the proposed ideas seriously. When employee ideas are accepted, a thorough communication process (for example follow-up meetings and continuous adjustments) is necessary to ensure that employees continue to feel motivated to advance new ideas. This also applies when an idea is rejected.[47] In most cases, businesses need to improve internal communication in order to gain full access to employee resources. Many already experiment with enhanced employee engagement in business greening issues (for example production efficiency, environmental improvements, employee health and safety). See also the box above.

46 Andersen 2009.
47 IBAM 2011, 11.

3.3.3 Examples of existing ILO tools and resources

ILO has a number of tools and resources available to facilitate inclusion of employees in environmental sustainability efforts at business and organizational levels.

1. The **Enabling Environment for Sustainable Enterprise (EESE) Toolkit** is aimed at helping employers' organizations create an environment that supports sustainable business development. The toolkit further helps employers' organizations identify constraints in the development of sustainable enterprises and formulate advocacy and proposals for reform that can be used to make dialogue with government more effective. The EESE Toolkit is built around the ILO's 17 Pillar Sustainable Enterprise Framework[48] and it focuses on the political, economic, social and environmental aspects of doing business.



48 ILO 2011b.

In terms of methodology, EESE combines a variety of data collection and diagnostic techniques, including a literature review, enterprise surveys, focus groups, statistical analysis of primary and secondary data, and consultations with experts. The perceptions survey includes both employers and workers as respondents. The formulation of policy recommendations is grounded on consensus between workers, employers and government.

For more information on EESE Toolkit, see: http://eese-toolkit.itcilo.org/

2. The ILO-hosted **Sustaining Competitive and Responsible Enterprises programme, SCORE,** presents one method of incorporating environmental and health issues through enhancing the productivity, sustainability and job equality of SMEs. SCORE is a practical training and in-factory counselling programme that increases the performance of SMEs while also promoting respect for workers' rights. The programme demonstrates best international practice in manufacturing and in service sectors, and helps SMEs access global supply chains. SCORE focuses on developing cooperative workplace relations. Workers and managers participate together in two-day classroom training sessions and local experts follow up on-site to help enterprises implement what has been learned. Modules cover a range of subjects, including workplace cooperation, quality management, human resource management, and occupational safety and health. The SCORE project is currently working closely with government agencies, training organizations, industry associations and trade unions in Africa, Asia and Latin America, to enable them to deliver SCORE training independently in the future.[49]

The SCORE Training Process

- combines classroom training with on-site consultations, to fully address individual company needs.
- is based on lean manufacturing techniques that are proven to increase production efficiency.
- builds worker-manager cooperation in support of initiatives that improve

49 ILO 2013.

enterprise performance.
- represents excellent value for money – training costs can be recovered within one month.

For more information on SCORE, see: http://www.ilo.org/empent/Projects/score/lang--en/index.htm

3. The **Greener Business Asia** project aimed at helping those countries that had experienced or were currently experiencing rapid economic growth to keep up with environmental and social standards. The project was implemented in Thailand and the Philippines, focusing on tourism and the automotive industry respectively. A bipartite model of cooperation was adopted to produce a core set of materials that could be easily adapted and used to improve the triple bottom line of manufacturing and service industries, since these form the backbone of many Asian economies. In supporting capacity-building and knowledge-sharing, the project supported a new set of green business development services at sectoral level and strengthened tripartite organizations' ability to contribute to policy fora, thus helping them fulfil their role in achieving sustainable development in the region.[50]

Greener Business Asia: the approach

For more information on GBA, see: http://www.ilo.org/asia/whatwedo/projects/WCMS_152342/lang--en/index.htm

50 ILO 2009.

4. In Latin America and the Caribbean the ILO is employing a **System for Integrated Measurement and Improvement of Productivity (SIMAPRO)** methodology (see 3.2.1), which has had a significant positive impact on productivity as well as worker satisfaction and environmental sustainability among businesses in the regions. The methodology is based on social dialogue and is a participatory proposal for knowledge management in organizations. SIMAPRO helps connect training with productivity in a holistic way that allows both economic profitability and social and environmental sustainability.[51] The ILO programme SIMAPRO is being implemented in a wide number of Latin American countries. For instance, in the sugar cane industry in Mexico a Self-Training and Assessment Guide has been developed on the topic of environmental conservation.

   For more information on SIMAPRO (in Spanish), see: http://www.oitsimapro.org/

51 Mertens 2009.

Key learning points

3.1 Green business: the link between the environment and enterprise performance

- All economic activities involve either direct or indirect use of natural capital assets. Since a large part of economic activities is performed by businesses, enterprises have a strong effect on how natural capital assets are used. The way of doing business is therefore at the core of the paradigm shift needed, particularly when considering the total environmental effects of products in a life-cycle perspective (from raw material extraction, to production, and the use and disposal of manufactured outputs).
- Environmental challenges and regulations are a material concern for many businesses. At the same time, there is increasing evidence of businesses that have yielded significant returns on investment and reputational benefits by efforts to reduce their emissions, waste, materials or energy consumption.
- The **external and internal drivers** for change from business as usual to environmentally sustainable economies and enterprises include:
  - Increasing environmental regulations and market incentives, and their effect on the business community.
  - Responding to consumer expectancy to engage in responsible environmental practices.
  - Urgency to respond to environmental challenges due to the effect of natural resource depletion on growth.
  - Material and energy efficiency to reduce enterprises' dependency on commodity prices.
  - The opportunity of creating more value with less impact.
  - Improving competitiveness through environmental risk reduction, increased effectiveness, increased sales and customers' retention, and new markets / products development.
- Significant **challenges** still remain, in both industrialised and developing countries, which prevent many companies from becoming green enterprises, among them: lack of information and awareness, lack of enabling business environments (including, legislation, regulation, voluntary agreements, economic instruments, integrated product policies and stakeholder engagement), ineffective communication channels to support dialogue with governments and other stakeholders, resource and capacity constraints in incorporating international standards in their business operations and in purchasing the new technology needed.

- While these challenges apply to companies of all sizes, SMEs may experience additional difficulties in greening their operations, mainly due to limited access to finance, subsidies and fiscal incentives, lack of qualified personnel and technological capabilities, ineffective or limited regulatory and policy framework, weak linkages and cooperation between research and industry and -for developing countries in particular- trade barriers and difficulty in attracting foreign investors and/or companies and international policies focusing on indigenous eco-innovation capabilities.

3.2 Greening enterprises: concepts and tools

- The concept of green(er) enterprises combines business growth and competitiveness with the needs of people to facilitate a decent living in a healthy environment. It consists of two main strategies:
  - **Greening of enterprises** means helping enterprises of all types to continuously improve their resource productivity and environmental performance (greening the process). It also entails changing workplace behaviour and practices through housekeeping measures, process control, and new technologies and equipment, all of which aim at cleaning the various aspects of production.
  - **Creation of green enterprises** means facilitating creation of new enterprises that deliver green goods and services or business diversification within existing enterprises to tap into green market opportunities.
- A range of well-established approaches exist that can guide both strategies. The most widely applied **concepts, methodologies and approaches** discussed in this Guide, include:
  - *Eco-efficiency*, an organizational framework which encourages business to search for environmental improvements that yield parallel economic benefits. It focuses on business opportunities and allows companies to become more environmentally responsible and more profitable.
  - *Cleaner production*, the continuous application of an integrated preventive environmental strategy at enterprise level to processes, goods, and services to increase overall efficiency and reduce risks to humans and the environment.
  - *Environmental management system*, a structured methodology that helps a company address its environmental regulatory demands in a systematic and cost-effective manner, by mainstreaming environmental management in the organizational structure, planning activities, responsibilities, practices, procedures, processes and resources.

- *Sustainable supply chain management*, a supply-chain strategic approach which applies the eco-efficiency and cleaner production approaches, to improve the environmental performance not just of an enterprise, but of an entire sector through a value chain approach, by considering all activities that a good or service requires from its conception to its delivery.
- *Life-cycle thinking*, a management approach applied to the whole production and consumption cycle, to reduce the environmental impact accumulated by a product/service throughout its entire life, from the extraction of resources, through the manufacture and use of the product, to the final processing of its disposal.
- *Circular economy*, a concept applied at company, industry, and economy levels to promote re-using, repairing, refurbishing and recycling of existing materials and products, as well as better eco-designing of products that will allow their durability, reparability, recyclability and waste prevention.
- *Sustainable consumption and production*, an holistic concept applied at value chain level to promote the use of services and related products, which respond to basic needs and bring a better quality of life while minimising the use of natural resources and toxic materials, the emissions of waste and pollutants over the life cycle of the service or product.
- *Eco-innovation*, a broad concept applicable at enterprise, entrepreneurship and organizational levels, to facilitate the introduction of any new or significantly improved product (good or service), process, organizational change or marketing solution that reduces the use of natural resources (including materials, energy, water and land) and decreases the release of harmful substances across the whole life-cycle.
- *Green business model*, a business strategy which supports the development of products and services with environmental benefits throughout the value chain.
- *Green entrepreneurship*, a business strategy applied for the creation of new businesses and based on development of eco-innovative products or services.

- According to the ILO and the OECD, **green entrepreneurship** can be defined from two perspectives related to the output (products and services) as well as the process (or production) of an economic activity. Usually, green entrepreneurs consider both aspects in their business models, creating additional decent employment through the use of more environmentally friendly processes, while reducing the overall environmental impact as a result of people or companies using the final product or service.
- **Clean-tech and eco-industries** are a growing economic sector where many start-ups find business opportunities. Initiating a new business based on a green or sustainable business models is another strategy entrepreneurs can look into. New enterprises do not necessarily need to rely on novel technologies and products. New trend of **green business models** rather suggest to deliver value to

customers differently, such as not via selling the product, but selling the value this product can offer. In recent years **Product-Service Systems** have proved to enhance the business competitive advantage in a green market. PSS can be defined as a model combining physical goods and intangible services that satisfy specific customer needs.

- Going beyond the technological implications and environmental benefits of the eco-innovation and green products, the ILO promotes a systemic approach that also aims at boosting employment gains. Besides the narrow technology-based aspects of doing business, green entrepreneurship can nurture a culture of life-cycle based thinking and stimulate green innovation at society level.

3.3 Towards sustainable workplaces

- Because their benefits are less tangible, the social and ethical dimensions of sustainability have to date not been given the same attention within the business community as the environmental dimension. However, examples of positive links exist between environmental improvements and health and safety improvements in the workplace.
- Businesses influence the health and safety of their employees at every stage of their product's life-cycles, from resource extraction to end-of-life disposal. Consequently, greening of industry not only benefits the environment but carries with it a real opportunity to improve working conditions and employee health.
- A good worker–employer dialogue is necessary to ensure a high degree of flexibility and adaptability to new ideas and changes among workers. When employers ensure thorough and rapid transmission of information and communicate openly about new processes and changes, workers tend to feel more capable and less hesitant to participate in the process of greening the enterprise.
- ILO has a number of tools and resources available to facilitate inclusion of employees in environmental sustainability efforts at business and organizational levels, such as: the Enabling Environment for Sustainable Enterprise (EESE) Toolkit, aimed at helping employers' organizations create an environment that supports sustainable business development; the Sustaining Competitive and Responsible Enterprises programme (SCORE), a method of incorporating environmental and health issues through enhancing productivity, sustainability and job equality of SMEs; the Greener Business Asia (GBA), a bipartite model of cooperation that can be easily adapted and used at enterprise level to improve the triple bottom line of manufacturing and service industries; and the System for Integrated Measurement and Improvement of Productivity (SIMAPRO), a methodology based on social dialogue and participatory knowledge management in organizations.

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Section 4

The role of EOs in greening economies through lobbying, advocacy and service development

4.1 Lobbying and advocacy for a greener and sustainable business environment[1]

Moving towards sustainable development is a shared, cross-sectoral and economy-wide challenge which can only be achieved if all stakeholders are committed and take action. Among them, business plays a crucial role in driving changes through innovation. Prosperity will depend on a systematic public-private sector alliance capable of promoting the necessary incentives and reforms in the business environment for enterprises to generate the technologies, knowledge, skills, and investments needed for the transformative change a sustainable development path would require.

Employers' organizations and business associations represent the 'voice of business', either as a whole or with regard to specific industrial sectors. As such, these organizations act as an accessible aggregator of opinions across and within sectors. Policymakers tend to give greater weight to the views of employers' organizations than they do to individual companies. This is mainly because employers' organizations often represent tens or hundreds of thousands of jobs, and account for a large share of markets, and they are also perceived to have a more impartial perspective than individual companies.

This chapter analyses the current efforts of employers' organizations around the world to represent the voice of business in the sustainable development debate. It also presents different perspectives on how these organizations aim to become drivers of change for greener economies through lobbying and advocacy.

4.1.1 Lobbying and advocacy on national environmental agenda

National employers' organizations should be actively involved in the formulation, implementation and monitoring of sustainable development policies appropriate to their country's specific circumstances.

While sharing a common global purpose (namely making the world of work relevant and resilient in the shift towards environmentally sustainable economies), business accepts that approaches and tools may vary from country to country and there is no 'one size fits all' solution.

As stated by the Employers' group at the International Labour Conference in 2013[2] "the greening of economies in the context of sustainable development

1 This Learning Unit is based on the official positioning of the International Organisation of Employers (IOE) on the environment and sustainable development and on the outcomes of the International Labour Conference Committee on Sustainable Development, Decent Work and Green Jobs held in Geneva, in June 2013.
2 102nd Session of the ILC 2013.

and poverty eradication will require a country-specific mix of macroeconomic, industrial, sectoral and labour policies that create an enabling environment for sustainable enterprises to prosper and create decent work opportunities by mobilizing and directing public and private investment towards environmentally sustainable activities."

Employers' organizations are structured in different ways, and represent their members through mechanisms that vary substantially from one case to another. Common mechanisms used by employers' organizations to gather the views of member companies include working groups, conferences, consultations on wording of letters and position papers, email correspondence and fora. Some employers' organizations operate through open structures; others have strong central leadership and chairing abilities.

Membership might have quite mature, firm and nearly unanimous views on some issues, while less convergent views on other topics, especially where roles are still being defined. In either case, the function of employers' organizations is to find a lowest common denominator among their members.

Influencing policy issues depends on a mixture of mechanisms that operate in the public and private spheres. For example, in the public sphere employers' organizations send out public statements, press releases and position papers which illustrate their views; and in the "private" sphere they act via private meetings, personalized briefing papers, phone calls and e-mails. With a few exceptions this type of information is not publicly recorded. Hence lobbying on policy issues is, by nature, difficult to track and monitor.

Additionally, in some countries and in specific contexts, it is particularly complex to reach consensus among the business community on how to influence environmental policies. It can therefore be difficult to assess the exact mechanisms that businesses and their employers' organizations are using to engage with environmental policy. Nevertheless we can enumerate a set of tactics that are generally used by employers' organizations to convey a business perspective and draw specific recommendations to the attention of government:

- establishing key relationships and briefing policymakers;
- shaping the policy agenda at an early stage, seeking to influence not just policy proposals but the policy agenda itself, even before policy options are being considered;
- using companies and other stakeholders to drive messages home;
- press work, publishing open letters and adverts;
- writing briefing papers and formal letters, and sharing information with policymakers and companies;
- events involving policymakers and technical policy experts;
- providing technical information and advice.

Despite the existence of different positions of business from country to country and in some cases even within a national business community, the International Organisation of Employers has identified **four main priorities for employers at global level**, namely:[3]

- building resilience for enterprises and communities;
- establishing efficient use and sustainable management of key resources;
- developing well-functioning markets and effective regulatory conditions; and
- improving governance and stimulating private sector involvement.

The following pages provide a summary of the main positions of IOE around these four priority areas, with some concrete examples of how this positioning can be defined at national level, in different contexts.

Building resilience for enterprises and communities

Resilience to deal with uncertainty

Employers seek to minimize disruption and maintain sustainable enterprises, jobs and economies, whatever the challenge. Resilience is seen as key to using the available tools to take responsibility at enterprise, community and individual levels in sustaining and developing wellbeing, competences, resources and entrepreneurship.

According to business, to face uncertainties

- governments need access to resources and expertise to plan not only for implementation but also to be able to cope with disruption, disaster and recovery;
- enterprises need the versatility and flexibility to unleash their innovative technologies and services, and the skills and creative potential of all their employees;
- individuals need jobs and opportunities that enable them to develop and use their competences, skills and creative potential fully in their work and within their communities.

Just transitions

The world has always gone through transitions. There is no reason why transitions to a more sustainable world need to be more or less "just" than any other transition at workplace level. All transitions should be handled well and with proper consideration for the needs of all.

The mechanisms required for improved environmental performance are similar to those required for any other form of growth, wealth and job creation. Transitions that produce the optimum outcome for all parties require parties' involvement in

3 Zero draft of the outcome document of RIO+20 and vision of the Employers' Group expressed to the Committee during the 2013 ILC discussion.

identifying concerns and solutions. **In this respect employers' organizations have a strong role in promoting active participation of their members in social dialogue at enterprise, sectoral and national levels in order to assess opportunities and resolve challenges posed by the transition**.

FICCI Climate Change Task Force Report – India

In 2007 the Federation of Indian Chambers of Commerce and Industry (FICCI) established a Climate Change Task Force (FICCI CCTF) representing various sectors: carbon advisory, cement, coal bed methane, financial, forestry and land, management, HFC, legal, oil and gas, pulp and paper, state government, thermal power, urban transport, waste management and wind power. The CCTF's objective was: i) to evolve an industry position on climate change; ii) to look at measures by industry towards climate change mitigation; and iii) to develop a consensus on policy, regulatory and fiscal measures that would be required to formulate effective mitigation strategies.[4]

A report presented in 2007, called for a comprehensive National Climate Change Policy based on the *review of national policies* and including *macro level policy recommendations.* The Task Force placed great emphasis on sectoral measures, calling for Governmental incentives and tax depreciation on investments to stimulate cleaner and more sustainable products. R&D recommendations for GHG mitigation and energy security constitute another vital section of the report, which greatly contributed to raising awareness among Indian stakeholders. The core suggestions are: "achieving energy security while ensuring harmony with the environment, improving resource recovery during extraction of energy sources, more R&D aimed at harnessing clean and renewable sources of energy, and improving energy efficiency of industry and transport."[5]

Source: FICCI, *FICCI Climate Change Task Force* Report (2007), available at http://op.bna.com/hl.nsf/id/thyd-79krk3/$File/FICCI%20Report.pdf

Health and wellbeing

Sustainable management of resources such as land, agriculture, forests, water and the oceans is underpinned by ecosystems and biodiversity which determine the

4 Federation of Indian Chambers of Commerce and Industry. *FICCI climate change task force report* (FICCI, December 3 2007) Available at http://op.bna.com/hl.nsf/id/thyd-79krk3/$File/FICCI%20Report.pdf

5 Ibídem, p. 33.

longer-term resilience and health of the environment and which are major factors contributing to the wellbeing of people as a necessary foundation for their resilience.

Solutions to many of the challenges of sustainable development as well as disaster aversion and recovery are trans-boundary and need to be addressed at regional and international levels.

Employment

Business will be the key to providing solutions to climate change and environmental concerns, and new industries developed solely as a response to these challenges will owe allegiance to other technologies and businesses. New jobs – green or otherwise – will mainly be created by the market to satisfy needs and will benefit from innovative developments. It should be recognized that green jobs and green technologies will rely greatly on the whole range of jobs and technologies and the distinction will become even more blurred in the future.

"Green policies" do not inevitably induce growth or net job creation: greening requires economic growth. Policies aimed at creating so-called green jobs should not come at the cost of a net reduction of jobs across the overall economy, nor should such policies create only temporary, unsustainable jobs or jobs that reduce productivity.

Skills, education and training

In order to operationalize the green economy concept, there is a need for society to build competences in the interests of resilience and for enterprises to have access to the right skills for the right jobs. **The move to greener economies will mean that all skills requirements will be affected to a greater or lesser extent**.

Without the necessary skills and know-how, transition to a green economy will not be possible. Economic policies need to be aligned with labour policies to equip employees with new skills and help create new job opportunities. A thorough analysis is needed on a regional basis of demographics, the state of current and potential economic development, and the key skills needed to move regions from where they are now to a greener economy.

It is important to assist businesses in their engagement with Governments and training providers in anticipating:

- the skills that enterprises will need for their future sustainable business architecture;
- the core disciplines and transferable skills required and where those skills will be obtained;
- the need to influence education and training providers at all levels to encourage entrepreneurship thinking and provide business-ready skills; and
- the need to manage a workforce which may not have the necessary skills for future business needs.

Public–private skills initiative for the promotion of renewable energies through skills upgrading and retraining – Navarre, Spain

In Spain, a public–private skills initiative in Navarre created a training centre for renewable energy (CENIFER) that contributed to an increase in electricity production from renewables from zero to 65 per cent of the total in 15 years.

"In the 1980s and 1990s, the Spanish region of Navarre suffered from a severe economic downturn when high oil prices impaired the competitiveness of its single large industrial employer, a Volkswagen car plant. Unemployment soared to a peak of 13 per cent in 1993. The regional government responded with active industrial policy measures, including worker retraining, to expand the renewable energy sector.

A rapid and successful development of a wind power industry followed, facilitated by the favourable geographical and climatic conditions of the region alongside a clear corporate and public strategy. The region expanded the share of its electricity production derived from renewable sources to 65 per cent, with an eventual target of 100 per cent. This small region of Spain, with a population of just 620,000, is now Europe's sixth largest producer of wind power. From 2002 onwards Navarre has been implementing its Environmental Training Plan. In cooperation with the Confederation of Entrepreneurs of Navarre and the Navarre Industry Association, the regional government identified the main skills shortages in the region through a project entitled "Strategic talent in the renewable energy sector", and on the basis of its findings set up CENIFER, a public training centre for renewable energies, which became a major training provider for the sector. In 2006, the country's first graduate programme for electrical engineers in wind and solar electricity was launched at the Public University of Navarre.

Between 2002 and 2006, employment in renewable energies across Navarre increased by 183 per cent. In 2007 alone, 100 companies and over 6,000 jobs in renewable energies were created. Unemployment dropped to 4.76 per cent. Even in the economic and employment downturn of 2009 Navarre maintained the lowest unemployment levels in Spain. This achievement bears witness to the success of a policy mix which incorporated environmental and skills measures in a proactive response to an economic crisis with a view to long-term dynamic development."

Retrieved from: Strietska Ilina, O. et. al "*Green restructuring in Navarre: A successful shift to renewable energies*" in *Skills for Green Jobs: A Global View, Geneva: ILO, 2010. pp 85.* Full text available at http://www.ilo.org/global/publications/ilo-bookstore/order-online/books/WCMS_159585/lang--en/index.htm

Establishing efficient use and sustainable management of key resources

Improving the environmental performance of current businesses

The main challenge is to make current processes, product use and services delivery more resource-efficient and environmentally responsible. This process can enrich and "green" current jobs. Environmental initiatives and improvements are a function of:

- innovative technologies and facilitation of their development;
- changes of attitude with regard to waste, emissions and environmental degradation;
- application of cradle-to-cradle thinking in the design process;
- enhanced interest in resources/ecosystems/biodiversity;
- increasing concerns about security of supply of energy and food;
- better workplace cooperation and culture of dialogue between management and workers;
- involvement of the entire economy, including all sectors and with special attention to supply and value chains; and
- recognition of the global interrelatedness of all programmes and investments.

Holistic lifecycle thinking

Efficient use and sustainable management of key resources will require **holistic lifecycle thinking** and will be a long-term effort with no clearly defined end-point. There is a growing awareness of the benefits of ecosystem services, efficient resource and waste management for businesses and society at large, and of the potential for investing in natural capital for the green economy.

Developing well-functioning markets and effective regulatory conditions

Pre-planning

Employers' organizations need governments to provide the framework to facilitate sustainable enterprise development by intelligently combining policy instruments such as market-based and objective-focused regulations, targeted investment, public-private partnerships and procurement policies, which can all reinforce sustainable development and job creation.

Environmental licensing: proposals for improvement – Brazil

Environmental licensing has existed in Brazil since 1981. It was established by the National Policy on Environment (*Política Nacional do Meio Ambiente – PNMA)* as one of its main instruments for environmental management. Through environmental licensing Brazil's public administration controls human activities that impact on environmental conditions, and seeks to reconcile economic development with the use of natural resources.[6] Despite its potential, environmental licensing has led to discontent within the entrepreneur sector, which considers obtaining an environmental license timely, costly and excessively bureaucratic.

To better appraise the challenges faced by entrepreneurs in the different States of Brazil, the National Industry Confederation (*Confederação Nacional da Indústria – CNI*) conducted in 2013 a research on environmental licensing in the States of Brazil. The document compiles the core issues expressed by representatives of the Industrial Federations on this subject. A first concern was identified in the lack of general unified norms on environmental licensing applicable throughout the country. General integrated norms are necessary to grant stable regulatory and institutional frameworks that decrease State bureaucracy and provide greater legal security.[7] Moreover they would eradicate competition between States and municipalities by instilling greater rationality into environmental legislation (which at present contains over 27 thousand Federal and State laws). Another inefficiency was identified in the fact that environmental licensing processes often do not account for economic potentialities at state or regional levels. The so-called *Zoneamento Econômico Ecológico (ZEE)* is in place in less than one-third of the Federation's units.[8] Environmental licensing often neglects specific sector characteristics and the heterogeneity of ventures and activities established in different areas.

After analysing the main inefficiencies the CNI's report sets out a series of recommendations that should be put in place to turn these bottlenecks into pieces of effective environmental legislation.

Full text available at: Confederação Nacional da Indústria (2014). *Licenciamento ambiental: propostas para aperfeiçoamento*, Available at http://portal.tcu.gov.br/lumis/portal/file/fileDownload.jsp?fileId=8A8182A14939ECF401497AFB2F5775F9

6 Confederação Nacional da Indústria. *Licenciamento ambiental: propostas para aperfeiçoamento* [Environmental licensing: proposals for improvement] (Brasília, CNI, 2014), pp.21.
7 Ibídem, p.9.
8 Ibídem, p.10

However **the transitions required will create tensions**, which will in turn generate losses as well as gains for businesses and workers. Some enterprises and jobs will disappear completely, others will shift to other areas or sectors; some new enterprises and jobs will be created, others will require completely new skills, and still others will require additional skills. All this will happen in different timeframes, and not all shifts or solutions will follow the same patterns globally and regionally. **Preplanning and consultation are essential to minimize disruptions from technological and organizational changes**.

French business confederation position on the proposed bill on energy transition towards green growth

Several reasons have contributed to making businesses in France worried about a proposed bill on energy transition. The multiplicity of quantifiable targets and timeframes makes them less coherent and feasible. Substituting the objective of low energy-intensity with a new objective of decreased energy consumption generates confusion. Hence, objectives should be structured with a reduction of CO_2 emissions as the main target. France's energy policy needs to be in line with European and international orientations, and the country's ability to handle such a rapid change in its energy mix should not be overestimated.

Competitiveness is not among the quantifiable targets. This raises questions on the project's impact on France's economy and industries. If the project is to impact positively on France's economy, cost-effective measures must be put in place and their impact on the country's economy quantified.

It is surprising that several measures relating to the circular economy have been introduced without consultation of businesses, which are some of its key players. The bill does not specify how sustainable financing is to be obtained for its energy transition and circular economy goals.

The law should fix objectives and choose players with the best cost-efficiency ratio to achieve them. Instead, it uses a purely prescriptive approach that could miss out on the benefits of innovation by imposing specific solutions. Several measures go against the government's objective of simplifying the business environment.

The importance given to R&D should translate into lifting obstacles to comprehensive exploration of all energy sources. Continued decentralization should be encouraged, and local initiatives should not restrict this optimization of the system.

Source: *Position du MEDEF sur le projet de loi relatif à la transition énergétique pour la croissance verte.*

Full text available at http://www.medef.com/fileadmin/www.medef.fr/documents/Transition_energetique/Position_MEDEF_loi_transition_energetique_16_10_14.pdf

BUSINESSEUROPE on Industrial competitiveness and the 2030 climate and energy package

BUSINESSEUROPE in a letter addressed in 2014 to President Manuel Barroso – as President of the European Commission – opposed any unilateral increase in the emission reduction target for 2020 by the European Union unless other industrialized countries accept comparable emission reductions and developing countries put in place measures to fight climate change within their respective capacities. BUSINESSEUROPE argued that the EU had to balance climate issues against competitiveness and claimed that EU faces an 'investment leakage' trend, with new investments in manufacturing sectors increasingly taking place outside Europe, notably because of the high costs of energy and environmental policies. BUSINESSEUROPE also pushed for the removal of individual national support schemes for renewables on the grounds that they distort the carbon price and expressed support for development and use of natural gas (including 'sustainable and safe' exploitation of shale gas) as an important alternative energy source.

Source: *Ben Fagan-Watson, Bridget Elliott, Tom Watson. PSI (2015). Lobbying by Trade Associations on EU Climate Policy.*

Framework for open markets and trade

Open trade and investment are critical enablers of technological dissemination and financing that will be required to move to greener economies. Policies to promote green economy concepts should be incorporated into domestic and global markets in a way that promotes competition within open markets on an equitable basis.

Stimulating innovation

Green economy policies to mobilize sustained business effort require sound enabling frameworks that promote investment and innovation and account for "green" externalities. Innovation for greening of economies requires major progress in the development and deployment of key technologies, better use of existing knowledge and technologies across sectors and geographical boundaries, and increased international and public-private co-operation.

Governments should avoid choosing winners and losers, and refrain from using regulations that benefit certain sectors to the detriment of others. Well-intentioned measures focused on improving environmental performance and generating employment may not necessarily create lasting employment and may introduce sector distortions that should not be seen as a substitute for long-term job creation through the market.

Confindustria's Position on the legislative decree "Sblocca Italia"

On September 26, 2014 the Confindustria's Technical Committee on Infrastructure, Logistics and Mobility was asked to convey a technical opinion on the legislative decree "Sblocca Italia".[9] In a hearing before the Environmental Commission of the Chamber of Deputies, the president of the Committee, Mr. Vittorio Di Paola, stated that this decree, despite aiming primarily at augmenting public and private investments in the public sector, also intervenes through specific, yet more limited, measures in areas of interest for the enterprise sector such as construction and landscaping, environment and energy efficiency.

With regard to the energy sector, while the decree foresees important measures to reduce Italy's dependence on foreign energy suppliers, Confindustria sees a wide array of possible improvements. Di Paola thus suggests a greater commitment in terms of energy-efficiency. This could be achieved first by favouring development of electric energy generation plants that recover waste heat produced in industrial processes. Not only would this measure release substantial investments, but it would also move the country towards a sustainable development scenario reducing environmental impact and energy consumption. Another measure that must be put in place is to set **tax deductions at 65% on energy efficiency interventions in the built-up environment, and maintain at 50% deductions on building renovation interventions**. Tax deductions would "positively orient enterprises and families giving a positive contribution to the recovery of internal demand".

Source: Confindustria, *Audizione del Presidente del Comitato Tecnico di Confindustria "Infrastrutture, Logistica e Mobilità"*, (September 26, 2014). Available at: http://www.confindustria.it/wps/wcm/connect/www.confindustria.it5266/2c3cb247-5c21-4768-9fe7-87f528b7caae/Doc+completo+Audizione+Confindustria+DL+133_2014.pdf?MOD=AJPERES

Regulatory improvement and fiscal reforms

Regulatory instruments should be objective-oriented and well-structured to maximise compliance. They should be combined with flexible and cost-effective market-based instruments (such as taxes, tradable permits and environmental subsidies) that can help achieve combined economic, social and environmental objectives. They should also include **removal of administrative burdens** for business to be able to enhance productivity while complying with environmental regulations. Fiscal reforms that shift tax burdens from labour to environmental impacts can create highly visible incentives that send messages to society to influence its behaviour and provide win-win outcomes for employment and the environment.

9 Legislative Decree of Septemer 12, 2014 n. 133 "Sblocca Italia" (AC 2629). The name literally means "Unlock Italy". The main nine areas of intervention of Sblocca Italia are: i) public and private investments, ii) environment, iii) energy, iv) transportation, v) residential housing, vi) simplifying construction and landscaping, vii) modifying the conference of services, viii) relaunching the Made in Italy brand, and finally ix) employment interventions.

Administrative burdens sustained by Spanish enterprises: A study of the Integrated Environmental Authorization

Administrative burdens constitute a major impediment to a country's economic growth. Since endorsing the Lisbon Strategy for growth and jobs, Spain has tried to identify and remove unnecessary administrative formalities that constrain enterprises' competitiveness, mostly of small and medium enterprises (SMEs).[10]

On 28 March 2011, within the framework of the National Action Plan for the Reduction of Administrative Burden,[11] a cooperation agreement was signed between the Spanish Public Administration and the Spanish Confederation of Employers' Organizations (CEOE by its acronym in Spanish) and CEPYME. The goal of this public-private partnership was to gather information on **how to reduce administrative burdens after having compared environmental legislation at national level with existing legislative schemes in the Spanish Autonomous Communities and Autonomous Cities**. The results of the multilateral consultations, meetings and interviews with enterprises, were collected in the 2011 Report "*Administrative burdens sustained by Spanish enterprises: study of the Integrated Environmental Authorization*".

In the light of the analysed inefficiencies, CEOE-CEPYME's report recommended a set of measures which would on the one hand promote the Voluntary Convergence of Autonomous Legislation and Procedures (CVL-PA from its Spanish acronym),[12] while on the other they would lead to a simplification of procedures for obtaining or renewing an AAI (*Autorización Ambiental Integrada* i.e. Integrated Environmental Authorization). Most interestingly, the effectiveness of these proposals was quantified in possible savings for enterprises and the results were astounding. Between 2013-2015 over €383 million could be saved in reduced administrative burdens in the process of renewing AAIs in force. Moreover, from 2013 onwards a complementary saving could stem from the reduction of administrative burdens on new facilities and on substantial modifications to existing facilities. The total would exceed €14.2 million per year. Finally, starting from 2013 enterprises would benefit from a decreased opportunity cost associated with faster procedures for obtaining an AAI, and putting into service the authorized enterprises' facilities. The total saving would surpass €216 million per year.[13]

Source: CEOE (2011) Las Cargas administrativas soportadas por las empresas españolas: estudio de la autorización ambiental integrada Resumen ejecutivo 2011. Full text available at http://www.ceoe.es/resources/image/cargas_administrativas_autorizacion_ambiental_integrada_1.pdf

10 Source: http://europa.eu/legislation_summaries/employment_and_social_policy/eu2020/growth_and_jobs/index_en.htm
11 Plan Nacional de Acción para la Reducción de Cargas Administrativas, in Spanish.
12 Convergencia Voluntaria de Legislaciones y Procedimientos Autonómicos.
13 Executive Summary, 2011, p. 81.

Financing and investment

To facilitate the transition to a global green economy, large-scale financial resources will have to be mobilized to help finance flow towards and within the green economy. Access to finance and venture capital coupled with a favourable regulatory environment is crucial to stimulating eco-innovation, environmental technologies and green SMEs.

Improving governance and stimulating private sector involvement

Measuring progress

Progress towards a greener economy will benefit from development of transparent measures and indicators that make sense in social, economic and environmental terms, at individual enterprise level as well as at national, regional and global levels. Government in consultation with social partners should design and use **efficient and effective monitoring and data collection tools and information systems to monitor and evaluate the impact of the greening of the economy on growth and jobs. Reporting requirements should not impose further burdens on business** but should be part of a rationalization process for the development of indicators to be used alongside Gross Domestic Product (GDP).

Stimulating private sector involvement and partnerships

The green economy needs to provide the governing structures and platforms which allow new and transformative partnerships involving business to be shaped and activated. They should recognise that business plays a crucial role in the social and economic development of a country.

A greener economy depends on an engaged and incentivized private sector working in alliance with the public sector to create essential knowledge and skills and to promote the required continuum of life-long learning, technology, investment and financing.

Confindustria Energy Efficiency Plan 2010 – Italy

To attain the targets foreseen in the EU 2020 climate-energy package (adopted to adhere to the Kyoto Protocol), Italy has faced the challenge of reducing CO_2 emissions without compromising enterprises' competitiveness or generating further systemic costs. Overcoming the challenge of sustainability *vis-à-vis* competitiveness has required a paradigm shift that could pave the way for integration of energy efficiency and renewable energy into national energy policy. This is why, since early 2006, Italy has been focusing on upscaling its energy strategy by gathering indications on technology scenarios that could better shape national energy policy.

Confindustria, the Confederation of Italian industries, has greatly contributed to the process, establishing in July 2006 an Energy Efficiency Task Force (Task Force Efficienza Energetica), which involved all of the units of the Confindustria system, as well as two leading scientific institutions in Italy: ENEA and CESI RICERCA (now RSE). The primary goal was to identify all the relevant areas and sectors where energy efficiency could be effectively accrued.

The Task Force proposed a multi-faceted approach based on: i) measuring energy savings attainable without further costs for enterprises; ii) identifying the most attractive sectors (in terms of dimension and potential savings) for specific interventions; iii) emphasizing the technologies so far available to implement energy efficiency programmes on a cost/benefit assumption; iv) highlighting the importance of tackling efficiency through an integrated approach that seeks inter-sectoral synergies; v) supporting competent ministries in the task of promoting energy efficiency through a medium-long term coherent energy policy framework; and vi) defining and implementing communication and information campaigns to ensure the initiative's success.[14]

Confindustria, Proposte di Confindustria per il Piano Straordinario di Efficienza Energetica 2010 – Retrieved from http://www.efficienzaenergetica.enea.it/doc/industria/Confindustria_Efficienza_2010.pdf

Companies all over the world recognise that employers' organizations are a powerful force for influencing policymakers, and are working more and more with them to engage national governments with environmental policies. Employers' organizations should be able to meet the expectations of their members and continue facilitating the debate on key environmental challenges so as to position business views successfully and be able to effectively influence policy development at national and international levels.

14 Ibidem, p. 11.

As argued by the Employers' group at the International Labour Conference in 2013,[15] all jobs have varying degrees of environmental impact. The objective of lobbying and advocacy at national level should be to improve the environmental efficiency of all jobs rather than trying to classify jobs as green or brown. The same goes for business and the economy: "greening" should be considered as a continuous process and not an outcome in itself. All business should make their operation greener to be sustainable and to survive in the future.

As indicated in the Guidelines on "Climate change and its impact on Business" recently published by the International Organization of Employers, "business must be at the heart of the discussions on country pledges as it has the knowledge and experiences of practical and cost-effective initiatives for greenhouse gas reductions" (IOE, 2015). Employers' organizations should be well equipped to offer guidance and adequately represent company-members. Environmental challenges have an impact on a broad range of areas and political agendas, and thus on the framework conditions for business operations. In this context, the establishment of clear consultation structures with employers' organizations, at least on employment policy and training needs of industry, is necessary. Proactive actions must be undertaken to cope with the challenge and achieve the objective of climate change and sustainable development requirements.

15 102nd Session of the ILC 2013.

4.2 Service development to support the greening of economies and enterprises

The delivery of quality services to members is a key value-added of employers' and business organizations. By providing such services they help member companies cut transaction costs, optimize regulatory compliance, grasp development opportunities and improve their performance, thus contributing to the sustainability and growth of business.

From an institutional perspective, providing services is an essential strategy for retaining existing members and attracting new members, leading to greater representativeness and influence. Furthermore, employers' organizations increasingly need to sustain themselves through direct service provision, in addition to membership subscription.

The recent global economic changes have affected the organizations representing and serving business, as much as businesses themselves. Employers' and business associations are redefining their service strategies for a number of reasons. With the transformation of markets, the needs of member-companies have significantly changed. This shift is also reflected in most aspects of doing business, namely production processes, workplace relations, management and administration, and so forth.

As a result of these transformations, businesses demand new services in areas which go beyond traditional industrial relations services. Simultaneously, growing market competition from private service providers – such as consultancy firms, other associations or highly skilled individuals – forces organizations to make strategic choices, rethink old paradigms and innovate.

The challenge of servicing a diverse membership – from large MNEs (that are less reliant on services) to SMEs and microenterprises – contributes to a re-thinking of the service role. A growing number of employers and businesses therefore offer a range of services in the environmental area aimed at helping members to:

- be up-to-date with new environmental legislation and regulations;
- comply with environmental regulations;
- reduce the operating costs of businesses through energy efficiency measures, environmental management, and efficient waste disposal; and
- seek sustainable business opportunities.

The development of new services offered by employers' and business organizations in environmental areas is stronger in countries where there is a growing demand for sustainable goods and services and where new stringent environmental regulations or taxation systems exist which oblige businesses to reorganize their production processes.

Direct service provision is usually limited to organizations which have companies as members. Environmental services are therefore provided by national, sectoral

or territorial organizations, depending on the national context and the evolution of the business representation system.

Most employers' and representative business organizations have an environmental department. Alternatively, they cover this area as part of their energy department or their Corporate Social Responsibility (CSR) activities.

The different types of service which employers' organizations provide to members can be grouped into five categories:

- information
- awareness raising, sensitization and networking
- business development and advisory services
- training
- innovation and projects.

4.2.1 Information

A key service which almost all employers' organizations EOs offer is the provision of relevant and accurate business information to its members. Access to information is one of the main reasons why companies join EOs. They expect the organization to help keep them up-to-date with new regulations and to provide them with analysis of legislation, selections of relevant statistics, or news relevant to their activity sectors.

Companies need to share or publicize their own information or news with other members of the business community. They also require information on other companies in their sector.

The exceptionally rapid development of digital communications in the past ten years has led to major changes. Most organizations now provide information through e-communication – a cost-effective way of facilitating a rapid flow of information. Direct e-mail and websites have replaced postal mailing and printed magazines while bulletins are quickly disappearing. Some organizations have also developed more sophisticated platforms through which they communicate information to their members only (i.e. intranets or portals). Hence, due to this digital revolution the amount of information has soared dramatically in all areas and is much easier for all to access.

This represents a new challenge for business organizations; the information they deliver needs to be specific, responding to business needs while standing apart from other sources. This in turn requires a large effort to select the relevant information and present it in a manner that suits companies. Information provided by the employers' organization should help companies save both time and money. It should also be:

- well-classified: the website should be structured as an online library, where information is easily accessible through an internal search system;

- original: not only presenting facts or legislation, but also providing interpretation and analysis.

Regarding environmental areas, information provided by employers' organizations ranges from:

- text of new legislation/regulations, including interpretation or selection of relevant pieces of legislation;
- policy and legislative proposals;
- best practices and successful experiences in facing environmental challenges;
- practical ways of measuring and reducing the carbon footprint (and energy costs);
- best practices and success stories of company members in energy efficiency and waste disposal;
- environmental statistics;
- news on important legal cases;
- information on environmental management systems (ISO 14001, Eco-Management and Audit Scheme in Europe, etc.);
- information on new trends and initiatives on sustainability for the business sector, such as Corporate Social Responsibility CSR issues or reporting tools; and
- public information programmes that help people understand and/or to clarify technical concepts concerning business activities.

Publications

Publications are a means of conveying more in-depth information and providing exclusive data. However, few employers' organizations write manuals, guides or publications on environmental issues. The type and number of publications may therefore be a good indicator of the level of sophistication of an employers' organization in addressing environmental themes.

In general, information services are provided to members free of charge, except when an organization capitalizes on the provision of high value-added and sophisticated information.

Review of best emerging practices

1) Online Environment, Health and Safety Information Service

Irish Business and Employers' Confederation (IBEC)

IBEC provides members with an online Environment, Health and Safety (EHS) Legislation Update Service. The service gives subscribers access to EHS legislation, providing a short summary of the main implications of the legislation and its

relevance to the subscribing company. Companies can view this information on all legislation, but when subscribing to the services they can select legislation in the areas relevant to their activities. The service retains the initial selection, allowing subscribing companies to amend their list of relevant legislation as their activities change. Throughout the year subscribers receive an email notification as new legislation relevant to their economic activities is published.

There are three parts to the EHS service:

- ***Irish Environment:*** this service is driven by national requirements, environmental management systems, corporate audits and environmental liability.
- ***Irish Health and Safety:*** this service meets the growing need for integrated environmental health and safety systems to ensure compliance with health and safety legislation and certification.
- ***EU Environment:*** this service concentrates on environmental European Community Regulations which are directly applicable in Ireland and place legally-binding requirements on Irish companies.

IBEC offers five **pricing options** for this service (one-year subscription):

.	Service	Price
1	Irish Environment Legislation	€ 500
2	Irish Health & Safety Legislation	€ 500
3	EU Environment Regulations	€ 200
4	Irish Environment AND Irish Health & Safety Legislation	€ 850
5	Three services	€ 950

2) **Information system on environment**

Asturian Employers' Federation (Federación Asturiana de Empresarios, FADE)

FADE is a regional employers' federation affiliated to the Confederation of Spanish Employers' Organizations. It has a well-developed website (http://web.fade.es) which provides a full range of useful information to its members, including:

- monthly e-bulletin reserved for company members;
- environmental news, updated daily, relevant to business (with summary and links to the original source of information i.e. newspapers, specialized agency, etc.);
- online library with access to publications/documents guiding national and international debates on environmental issues;
- texts of pending legislation and major policy developments on environmental matters, at regional, national and European levels;
- environmental grants and subsidies: funding opportunities at national and international levels; and

- FADE initiatives in environmental areas (conferences, training, projects).

3) Manual on "Business Opportunities in the framework of Clean Development Mechanism"

Confederation of Brazilian Industry (*Confederaçao Nacional de Industria, CNI*)

The Confederation of Brazilian Industry is highly active in the environmental area. Detailed information can be found on their website on several topics concerning the environment, namely waste disposal, water management, biodiversity, environmental management systems, environmental certification, climate change and private-public partnership projects.

Furthermore, over the years CNI has been active in promoting (business) opportunities for Brazilian firms in the framework of the *Clean Development Mechanism*[16] by organizing conferences, workshops and consultancy services. CNI published a Manual on "Climate Change and Clean Development Mechanism", which introduces the topic of climate change and examines the international credit carbon potential business market. It helps analyze the basic aspects of feasibility, attractiveness, design and implementation of projects with the objective of reducing greenhouse gas emissions in the Brazilian productive sector through the Clean Development Mechanism.

The manual (available in Portuguese) can be downloaded free of charge from the CNI website (www.cni.org.br).

4) Best Sector Practices

Argentine Business Council for Sustainable Development (CEADS)

The CEADS is a business association that brings together more than 70 leading Argentine companies.

CEADS has produced 11 books with more than 400 business case studies on sustainable development. The objective of these publications is to communicate and spread best business practices on sustainable development, such as eco-efficiency, reporting, integrated management systems, recycling, by-product synergy, corporate social responsibility, suppliers, communication with stakeholders, sustainable livelihoods and a wide range of other related issues.

For more information, see: http://www.ceads.org.ar/casos.htm

16 The Clean Development Mechanism allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol to implement an emission-reduction project in developing countries. For more information see: https://unfccc.int/

4.2.2 Awareness raising, sensitization and networking

In many countries environmental sustainability and energy efficiency are at the top of national agendas and senior management at company level is directly involved in managing environmental and climate issues. In other countries environmental risks and challenges are a new emerging theme which business needs to confront. However, almost everywhere in the world there is a growing interest in environmental sustainability which is driven by consumer pressures, regulation stringency or taxation systems. For these reasons there is a space for business organizations to arrange awareness-raising and sensitization events, or internal activities such as workshops or regular meetings to exchange experience. The national context will shape the themes covered, the modalities, the level of sophistication and the technical level. Different activities could be scheduled during the year to maintain contact with members and to keep them informed. A business organization could for example organize an annual conference and monthly internal meetings, occasionally inviting an expert as "special guest".

Business organizations often organize or chair short conferences such as "environment day" (often on 5 June, World Environment Day), awards (see below), or regular meetings, which are useful networking opportunities to exchange experience, learn from best practices and maintain contact with environmental service providers.

Conferences, seminars and other environmental issues

Many business organizations arrange seminars, conferences or breakfast briefings with the aim of providing information on environmental issues or the environmental legal framework that industries must be aware of to operate in a country. Such meetings can focus on the implications that environmental challenges might have for business operation, or they can facilitate initiatives or sharing of experience with energy efficiency measures or actions that promote the preservation of the environment.

These events usually target SMEs and are provided free of charge on the organization's premises. In general they are not highly technical events addressing overly-complex issues targeting environmental specialists. They are part of a group of services provided to company members included in their subscription package. These events represent a good opportunity for the business organization to promote other services which it offers in environmental areas such as training or consultancy.

Awards

Some employers and business organizations organize or co-organize, in collaboration with national or local authorities, environmental, energy efficiency or sustainable business awards. These competitions usually recognize firms which have:

- improved their operational efficiency and reduced their environmental impact;
- developed new products or found new markets for products and services that help customers reduce their environmental impact or carbon emissions; and
- developed new processes, products or services that contribute to sustainable development.

Winners of these awards benefit from positive exposure that enhances their reputation among customers, suppliers and manufacturing industry as environmentally-aware businesses. Winners can usually take advantage of opportunities to promote their achievements – and their businesses – at events held by the organizations where they are able to share their insights and be positioned as leaders in their fields.

Winning these awards can also have a positive impact on human resources: being recognized as a leader company in promoting sustainable practices can enhance employee morale and motivation, leading to a more productive workforce as well as helping to recruit the best talent and retain existing skills.

Regular meetings and internal forums

Some business organizations work with their company members by undertaking sensitization initiatives and experience-sharing activities. They provide internal fora to enable their member companies to share best practices on sustainable development issues and to develop innovative tools that change the status quo.

Through regular meetings, company members are informed of new regulations and trends in sustainable development issues such as environmental regulation, the CSR agenda and energy efficiency initiatives. These types of meetings allow company members to be involved in a proactive agenda and to develop and maintain stronger relationships with stakeholders (NGOs and Government).

Strategic partnerships and alliances

Business organizations can support their members in forging strategic partnerships and alliances with other actors, such as academic institutions, NGOs, local communities or governmental departments. These alliances and partnerships help businesses generate relationships based on confidence and trust with the entire community where the businesses operate. A capacity to establish a dialogue with the community is especially important for companies operating in sectors which inevitably have an environmental impact (such as mining, infrastructure and construction).

Self-regulation

Business organizations have also developed voluntary regulations, creating self-regulation for certain sectors or group of companies. The outcome of a self-regulation process is the establishment of a rule, a procedure, or a method according to which an industry or sector should act. Taking into account particular situations, sometimes responsible industry self-regulation is preferable to government regulation as it initiates (without imposing) a gradual process of introducing new practices.

The regulation of an industry sector by its own members is an integrated learning process that usually requires creation of an internal committee or the inclusion of experts to develop sets of constructive behavioural standards.

This process might also be useful when there is no legal regulation on a subject. Sometimes the business organization has the possibility of creating and enforcing industry regulations and standards.[17]

The final objective is to increase business development through the establishment of rules that promote ethics and equality.

An example of a sectoral self-regulation standard is the "Global Good Agricultural Practice" (www.globalgap.com) – currently the world's leading farm insurance programme. This standard was initiated by retailers belonging to the *Euro-Retailer Produce Working Group* in order to harmonize their own standards and procedures, and develop an independent certification system.

Review of best emerging practices

1) Future Manufacturing Awards

The Manufacturers' Association (EEF) in the United Kingdom

EEF organizes the annual Future Manufacturing Awards. Among its six categories, one is directly related to the environment. Two specific awards are also granted to companies that have improved operational efficiency while reducing their environmental impact (*Environmental Efficiency Award*) or developed business opportunities associated with the green agenda (*Green and Growth Award*).

For more information, see: http://www.eef.org.uk/awards

2) Environment Day

Asturian Employers' Federation (Federación Asturiana de Empresarios, FADE)

Every year on 5 June, World Environment Day, FADE organizes "*Jornada de Medioambiente*" a one-day conference on environmental sustainability and

17 Source: http://www.iccwbo.org/advocacy-codes-and-rules/areas-of-work/marketing-and-advertising/self-regulation/

business opportunities.

In 2012 the theme was "Opportunities of Eco-innovation through Eco-design", in 2011 the "Spanish Energy model: challenges for the future", and in 2010 "Climate Change: Obligations for Employers". The objective of these days was to encourage reflection on business solutions and opportunities to face environmental challenges. The target group is company members affiliated to FADE.

For more information, see: http://web.fade.es

3) Internal fora

Argentine Business Council for Sustainable Development (CEADS)

The CEADS is a business association that brings together more than 70 leading Argentine companies.

It covers different areas of work. Within each area a monthly meeting is held during which numerous sustainability topics are periodically covered. The main areas of work are covered by the Technical and Legal Committee (in which issues such as eco-efficiency, cleaner production, legal and technical regulation are discussed); the Corporate Social Responsibility Group (which works on such matters as inclusive business, the role of business, NGO partnerships, reporting and communication, and ISO 26000); and the Energy and Climate Group (a group that draws together member companies to develop a special agenda on Clean Development Mechanism projects, efficiency by sector, carbon footprint, local business position, and the post-Kyoto Framework).

For more information, see: www.ceads.org.ar

4.2.3 Business Development and Advisory Services

A basic function of employers' organizations is to provide advice to their company members. Environment is an area with growing potential for advisory activities and business organizations can be ideally positioned to fill this demand. In many countries environmental responsibility stimulates cost-efficiency, competitiveness and growth. Providing services in the environmental area can lead to a reduction in a company's operational costs while improving its reputation. The most successful services do not only deliver information on compliance issues but also provide advice and support to help maximize business efficiency and reduce operating costs. At the same time business organizations can help companies establish environmental credentials, so that as a company's performance improves, so does its ability to win over competitors.

The advisory function can take on different forms, with varying degrees of complexity. A company may ask the environment focal point in the business organization about the provisions of a new regulation; or at a more complex and time-consuming level, ask the organization to undertake a full environmental

compliance audit. The audit might be provided at the business organization's office or on the company premises. Usually, the more complex (or in-depth) the service, the greater the likelihood that it will be performed at the company site.

For most employers' organizations, the advisory function is closely linked to the provision of information. In addition to batch-type information, the organization offers personalized, company-oriented advice. What distinguishes this function from an information service is that it specifically targets a single member company or specific sector.

Organizations with the most successful environmental services have developed an advisory role which goes beyond the "personalization" of information to cover extra topics on demand. These business organizations offer an integrated approach, combining phone or e-mail advice with specialized on-site consultancy and auditing. Usually employers' and business organizations do not have enough in-house expertise to rely only on their own staff to deliver these services. In most cases an environmental focal point (or department) handles phone and e-mail advice (desk function) and manages a network of consultants who perform on-site consultancies and audits.

Some innovative organizations have established partnerships with engineering universities: students (usually in the last year of their studies) perform preliminary assessments and audits, almost free of charge, to identify flagrant violations of and non-compliance with legislation. Following this preliminary assessment, if the company is interested it can access the full-price auditing service offered by the business organization, including a full audit by a technical team which records the necessary measurements using specialized equipment. The technical team delivers a detailed report covering waste disposal and an analysis of water and energy expenditures, in addition to proposals and recommendations for saving energy and water, including an assessment of the expected payback period in the event of implementation.

The business organization can also connect companies with technical experts or professionals specialized in certain issues.

In general, integrated environmental services include the following elements:

- identification of the risks presented by current operations;
- analysis and recommendations prioritizing both the actions companies must take in order to achieve compliance, and the actions companies wish to take in order to deliver business benefit;
- help in understanding the legislative requirements which production and/or products need to adhere to;
- achieving reductions in the materials, energy and water consumed and identifying alternative ways of recycling, reusing and trading waste created during production;
- introduction of environmental risk management as part of the strategic planning of the company;
- design of a strategy underpinned by systematic procedures that can be implemented with ease, with possible introduction of an environmental management system;
- assistance and support in obtaining environmental certification (e.g. ISO

14001); and
- acknowledging and giving advice on new initiatives and practices on sustainability issues.

Whichever service an organization decides to provide, the objective should be to help business reduce its negative environmental impacts, improve its reputation, save money and contribute to sustainable development.

Review of best emerging practices

1) "Mobile Energy and Environment Clinic" Programme

Amman Chamber of Industry

The Amman Chamber of Industry offers an interesting integrated environmental service. Companies can access this service at a subsidized price, contributing only 20% of the total cost (approximately US$1,000). Institutional donors and the programme partners – Jordan Enterprise Development Corporation – underwrite the remaining 80%.

The objectives of the programme are to:

- enhance energy efficiency;
- minimize industrial energy bills;
- minimize industrial water bills;
- protect the environment through decreased CO_2 emissions; and
- increase the industrial sector's awareness of energy, water and environmental issues.

The following services are included in the programme:
- preliminary energy and water audit through field visits conducted by a technical team to examine potential energy and water savings;
- preparation of a detailed technical report covering energy and water saving measures, analysis, proposals, and recommendations; and analysis of the expected payback period in the event of implementation;
- training of company representatives on how to identify and achieve potential energy savings;
- helping the company obtain financial support for implementation of the investments needed to implement the recommendations, with a partial non-refundable grant to promote realization; and
- coordination and supervision of implementation in collaboration with the technical team.

The most innovative element of the programme is that the Amman Chamber of Industry not only helps companies assess potential environmental savings, but closely monitors their potential need for affordable loans to implement the necessary investments.

2) Eco-efficiency Programme – Programa de Ecoeficiencia Empresaria "ECO UIC"

Cordoba Industrial Association (Unión Industrial de Córdoba – Argentina)

One of the most complete environmental services combining training, on-site consultancy, auditing and certification is offered by the Union Industrial de Cordoba (UIC) in collaboration with the Argentinian Cordoba Province, in Argentina. The programme targets SMEs operating in this province. The main objectives of the programme are to:

- include environmental management in SMEs' strategic plans;
- improve competitiveness and find solutions to minimizing SMEs' environmental impact;
- reduce losses and costs of solid, liquid and gas waste;
- satisfy needs of internal and external clients; and
- correct deviations and respond to complaints originating in the community.

The programme is divided into three steps (Bronze, Silver and Gold levels) and each phase includes development activities that help companies fulfil a number of environmental criteria and progressively implement their own environmental management systems. These steps are closely related to basic goals for achieving commitment and leadership by the SME management and also guide companies in the practical application of the key elements of eco-efficiency. The diagram below shows the programme scheme:

Each step of the programme is evaluated by a Technical Coordinator in collaboration with the Review Board which is composed of specialists from the UIC Environment Department. Together they assess whether SMEs are ready to progress to the next phase.

As shown in the diagram, the last step of the programme consists of accompanying the targeted SMEs in the process of obtaining the ISO 14001 certification (Environmental Management System).

Three types of activity are included in each step of the programme:

- Classroom training: workshops and/or seminars aimed at educating and training senior SME management.
- On-site consultancy: technical assistance at company level for each SME, guiding the company in the implementation of the concepts and criteria within the organization.
- Classroom consultancy: similar to on-site consultancy but performed in the classroom, a number of companies facing common problems and challenges and working in similar sectors are grouped together to discuss possible company solutions and create synergies. Exchange of experience is extremely important in this stage.

4.2.4 Training

Training is a popular service that many employers' and business organizations provide. There are usually two training formats: public training and tailor-made company training. Offering training to members (and non-members) is considered a "good service for starters", in particular for employers' and business organizations that wish to generate income from a service to supplement membership fees. Not too complex to organize and easy to run, this activity has high potential if managed and monitored well.

Training can take different forms, including courses, workshops, seminars or certification programmes. Many training programmes last only one or two days, whereas those offering certifications are longer and need to be authorized by governmental institutions. Courses targeting senior management respect time constraints, both in terms of length (½ – 3 days) and of timing (breakfast meetings, after normal working hours, or week-end courses).

A new trend within business organizations that already offer a training service is to provide accredited programmes or master's training, often in partnership with other institutions (universities, research centres, governmental institutions, etc.) to add value to their training programmes, improve their reputation, broaden audiences and boost profitability.

Training is provided by almost all business organizations addressing environmental issues. The level of sophistication and target group varies considerably, but there are usually four target groups: SMEs owners or senior management; employees with (new) responsibilities for environmental management; market and communication analysts; and other employees.

- *SME owners or senior management*, as drivers of change, should be sufficiently informed, committed and "buy into the idea" of improving energy efficiency, reducing carbon footprint, or introducing an environmental management system.
- *Employees with (new) responsibilities for environmental management* are the main implementers of any kind of improvement in the environmental performance of the company.
- *Market and communication analysts* should be able to communicate and demonstrate to clients the responsible environmental behaviour of their companies.
- *Other employees* should become more environmentally conscious with a view to implementing green practices in offices or on industry premises.

Not many organizations offer complex technical courses targeting environmental specialists. Most courses cover the following topics:

- Environmental Legislation
- Environmental Impact Assessment
- Introduction to Environmental Management Systems
- Cleaner Production and Products
- Environmental Risk Assessment
- Waste and Water Management
- Communication and Corporate Social Responsibility
- Green Marketing and Internal Audit training

Review of best practices

1) A wide range of short courses in environmental areas

Victorian Employers Chamber of Commerce and Industry (VECCI), Australia

VECCI regularly provides a number of short courses in environmental areas to members and non-members. The duration of training ranges between two hours (briefings) and half-days (short courses). The price per member ranges from approximately US$40 to US$200.

The target groups of these trainings are SME owners, senior managers, operations and facilities management staff, and market and communication analysts.

Five types of course are offered:

- *Environmental Legislation and Your Business (2 hours)*
  A short course introducing the main elements of environmental legislation with the aim of helping companies avoid costs and fines for non-compliance.
- *Marketing Your Environmental Business Credentials (4 hours)*
  Innovative course on the essential characteristics of environmental marketing and the benefits of marketing one's environmental credentials.

- *Resource Efficiency and Your Business (half-day)*
  Ways of reducing energy costs and of improving resource efficiency and sustainability in the workplace. Interestingly, participants are asked to bring copies of their recent electricity, gas and water bills and a quick analysis is performed during the workshop.
- *Carbon Management 101 Briefing (2.5 hours)*
  Knowledge-based course targeting SMEs on current national and international developments in the transition to a carbon-constrained economy, cutting through the 'carbon jargon' and providing an essential guide to measuring and managing a business's carbon footprint.
- *Green Office Briefing (2 hours)*
  The Green Office Briefing targets small-to-medium-sized and large businesses that wish to educate their staff to become more environmentally conscious and empower them to implement green practices in the office. It is a very practical course clarifying common myths around the usage of electrical appliances and providing guidance on managing paper use, electricity consumption, waste disposal, and purchasing attitudes in and around the office.

As with many other employers' organizations, VECCI can tailor training programmes to precise company requirements and deliver them on-site on company premises.

For more information, see: http://www.vecci.org.au/Training

2) Environmental Management School (Escuela de Gestión Ambiental)

Guayaquil Chamber of Industry (Cámara de Industria de Guayaquil – CGI)

In Ecuador the CGI recently launched a comprehensive master's training course on the environment. The training targets technicians working in companies affiliated to CGI. The full master's training programme lasts approximately 120 hours divided into eight modules. Companies can choose to follow the entire master's course or participate only in selected modules.

The price varies significantly between members (US$30 per module) and non-members (US$170 per module).

Themes covered during the master's training:

- Module 1: Environmental legislation
- Module 2: Competitiveness improvement and cleaner production
- Module 3: Checking atmospheric and noise pollution
- Module 4: Environmental auditing
- Module 5: Environmental management system
- Module 6: Physico-chemical treatment of wastewater
- Module 7: Biological wastewater treatment and water monitoring techniques
- Module 8: Solid waste management and integrated management of hazardous waste

For more information, see: http://www.industrias.ec/

4.2.5 Services for innovation and competitiveness

This section groups together a number of services which aim to improve companies' capacities to be competitive and green in various ways.

Obtaining funding opportunities

A growing number of international organizations, multilateral banks and national programmes have now established green credit lines for SMEs to help stimulate green behaviour and innovation. Accessing public national and international funds requires a good understanding and monitoring of calls for proposals, and the capacity to design projects which meet donor requirements. Often SMEs do not have the time, human resources or expertise to follow up on these opportunities. Employers and business organizations can help through services ranging from simple monitoring and alerting members when new credit lines are open, to provision of concrete support for collecting and presenting project documentation.

With the same objectives, some employers' and business organizations (for example in Brazil and India) help their members take advantage of opportunities offered under the *Clean Development Mechanism*. They operate as matchmakers between firms in industrialized countries which earn certified emission reduction credits and local firms which can benefit from emission-reduction projects. In addition, employers' organizations support local companies in developing such projects, analyzing the basic aspects of their feasibility, their attractiveness for foreign companies, and their design and implementation.

Cluster development in sustainable areas

In developing countries the private sector mainly consists of micro, small and medium-sized enterprises. Their development potential often remains untapped, as firms operate in isolation, are locked into uncompetitive and unsustainable production patterns, and are unable to approach dynamic business partners who could bring in new expertise and know-how.

Employers' and business organizations can play an important role in boosting the development of a competitive private sector by building sustainable linkages between small-size enterprises, their larger-scale business partners, and supporting institutions. In particular they can:

- promote business-to-business linkages and links between firms and institutions in all environment-related matters (especially energy efficiency);
- foster implementation of environmentally-responsible business practices at cluster level;

- develop public-private partnerships for the introduction of new cleaner technologies in specific clusters; and
- formulate and disseminate tools and methodologies for project implementation.

Online marketing of waste and by-products

This innovative service is provided by two organizations in Latin America to promote the exchange of waste and industrial by-products.

Review of best emerging practices

1) Access to credit

Argentine Industrial Union (Unión Industrial Argentina)

In Argentina the "Access to Competitiveness Programme" (PACC-SEPYME) is an open line of financing managed by the Ministry of Industry. It aims at increasing the competitiveness of domestic SMEs, with at least two years of activities behind them and whose sales of imported products do not exceed 25% of the total, as well as offering grants to improve SMEs' environmental performance. Grants can amount to 80% of total project costs with a ceiling of US$28,000 per project. The following activities are eligible:

- implementation and certification of standards;
- industrial process engineering;
- market research;
- strategic planning;
- health and safety improvements;
- environmental studies;
- development of websites; and
- e-commerce.

The Argentine Industrial Union also provides technical assistance to SMEs in project design and in presentation of the documentation needed to access the funds available within this programme.

For more information, see: http://www.uia.org.ar

2) Online market of waste and by-products

Guayaquil Chamber of Industries, Quito Chamber of Industry and Production, and Costa Rican Chamber of Industries (Cámara de Industrias de Guayaquil, Cámara de Industria y Producción de Quito and Cámara de Industrias de Costa Rica)

Borsi is a mechanism created by the National Centre for Cleaner Production and Environmental Technologies in Colombia (Centro Nacional de Producción más Limpias y Tecnologías Ambientales de Colombia) to promote exchange of waste and industrial by-products through sales transactions arising from supply and demand and through the recovery, recycling and re-introduction of these materials in the production chains. The successful initiative has been replicated in Costa Rica and Ecuador with the active participation of employers' organizations.

In Costa Rica, Mersi (the Costa Rican name for Borsi) is an inter-agency effort between the Chamber of Industries of Costa Rica and the National Centre for Cleaner Production. In Ecuador Borsi is managed by Cámara de Industrias de Guayaquil and Cámara de Industria y Producción de Quito.

Mersi and Borsi promote the waste market in Costa Rica and in the cities of Guayaquil, Quito and their hinterland. They play an important role in facilitating contact information and matchmaking between waste generators and companies demanding those wastes, or in providing environmental services for waste management.

For more information, see: http://www.borsi.org

Key learning points

4.1 Lobbying and advocacy for a greener and sustainable business environment

The main positions of the employers can be regrouped in four main priorities identified by the IOE:

1. **building resilience for enterprises and communities:** this is done by minimizing disruption and maintaining sustainable enterprises, jobs and economies, whatever the challenge; by promoting a just transition towards green economy through social dialogue; by managing in a sustainable way natural resources which determine the longer term resilience and health of the environment; by supporting and promoting green policies aimed at creating so-called green jobs; and by improving those skills and know-how without which transition to a green economy will not be possible.
2. **promoting efficient use and sustainable management of key resources:** in this case the main challenge is to make current processes, product use and services delivery more resource-efficient and environmentally responsible; for this to happen a holistic lifecycle thinking must be adopted.
3. **developing well-functioning markets and effective regulatory conditions:** in order to facilitate and get prepared for the transition towards green economies preplanning is essential to minimize disruptions from technological and organizational changes. In this context some measures appear to be critical: open trade and investment (critical enablers of technological dissemination and financing), stimulating innovation through appropriate incentives, regulatory improvement and fiscal reforms, facilitating the access to finance and venture capital.
4. **improving governance** through an efficient monitoring and evaluation system and **stimulating private sector involvement and partnerships**.

While sharing a common global purpose in the shift towards environmentally sustainable economies, business accepts that approaches and tools may vary from country to country and advocate on the fact there is no 'one size fits all' solution.

4.2 Service development to support the greening of economies and enterprises

With the transformation of markets, the needs of member-companies have significantly changed, reflecting the shifts in virtually all aspects of doing business-production processes, workplace relations, management and administration, and

so forth. As a result of these transformations, businesses demand new services in new areas which go much beyond the traditional industrial relations services. In this context different types of services are provided by employers' and business organizations to company members. For the sake of clarity we have classified these services into five categories:

Information

Providing accurate information to members in relevant areas for business is a key service provided by almost all employers' organizations. With regard to environmental areas, information provided by employers' organizations include guides, manuals and publications on: texts of new regulation, policy and legislative proposals; best practices and successful experiences in facing environmental challenges; practical ways of measuring and reducing carbon footprint; best practices and success stories of company-members in energy efficiency and waste disposal; environmental statistics; news on important legal cases; information on environmental management systems; information on new trends and initiatives on sustainability for the business sector; and public information programs that help people to understand and/or to clarify technical concepts concerning business activities.

Awareness raising, sensitization and networking

Almost everywhere in the world there is a growing interest in environmental sustainability which is driven by consumer pressures, regulation stringency or taxation systems. For these reasons there is a space for business organizations to organize different kinds of events and activities which include: conferences, seminars and other environment events; environmental, energy efficiency or sustainable business awards; regular meetings and internal fora to share information and experiences; strategic partnerships and alliances with academic institutions, non-governmental organizations, local communities or governmental departments; and developing self-regulation to promote ethics and equality.

Business development and advisory services

A basic function of employers' organizations is to act as advisers to their company members. Environment is an area with growing potential for advice activities and business organizations are in some cases in an ideal position to fill this demand. In order to help business reduce its negative environmental impacts, increase its reputation, save money and contribute to sustainable development

integrated environmental services include the following elements: identification of the risks presented by current operations; analysis and recommendations prioritizing both the actions companies must take in order to achieve compliance, and the actions companies wish to take in order to deliver business benefit; help in understanding the legislative requirements which production/products need to adhere to; achieving reductions in the materials, energy and water consumed and identifying alternative ways of recycling, re-using and trading waste created during production; introduction of environmental risk management as part of the strategic planning of the company; design of a strategy underpinned by systematic procedures that can be implemented with ease, with possible introduction of an environmental management system; assistance and support in obtaining environmental certification (e.g. ISO 14001); acknowledge and give advice on new initiatives and practices on sustainability issues.

Training

Training is a popular service that many employers and Business Organizations provide. There are usually two formats: public training, and tailor-made company training. In general there are four target groups: SMEs owners or senior management; employees with (new) responsibilities for environmental management; market and communication analysts; and other employees. The most common courses cover the following topics: Environmental Legislation, Environmental Impact Assessment, Introduction to Environmental Management Systems, Cleaner Production and Products, Environmental Risk Assessment, Waste and Water Management, Communication and Corporate Social Responsibility, Green Marketing and Internal Audit training.

Services for innovation and competitiveness

In order to improve companies' capacities to be competitive and green a number of services are offered by business organizations covering the following topics: obtaining funding opportunities through understanding and monitoring of calls for proposals and the capacity to design projects which meet donor requirements; cluster development in sustainable areas aiming at promoting links between firms and institutions on all environment-related matters, fostering implementation of environmentally-responsible business practices, developing public-private partnerships for introduction of new cleaner technologies in specific clusters, and formulating and disseminating tools and methodologies for project implementation.

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