

► Just Transition Policy Brief

November 2022

Greening macroeconomic policies: Current trends and policy options

Key messages

- Macroeconomic policies can provide significant support to achieve carbon emission reduction goals. In particular, enhancing the policy toolbox with green instruments can induce the investment in green energy, clean transport and cleaner production practices alongside investments into human capital and worker skills needed for the transition. At the same time, integrating climate goals in macro-economic policies can smooth the impact of climate shocks on the economy and ensure a just transition in labour markets.
- Fiscal policy needs to be adjusted with carbon pricing at the core. Carbon pricing should be introduced at large, be progressive and leveraged among those responsible for emissions, the income rich. Low-income households, least responsible but most impacted by carbon and energy price increases, should be exempted and protected against rising cost of food, housing and transport. A carbon tax could also be used to reduce the incidence of distortionary and regressive labour taxes and thereby reduce labour costs and inequality and maximize the reform benefits.
- The revenues from carbon pricing schemes should be earmarked for just transition and labour market initiatives including skills training, social protection and job transition schemes towards green growth sectors. Funds like the European Union's Just Transition Fund are transparent and efficient mechanisms to channel carbon revenues to the most impacted regions, occupations, and households.
- Monetary policy plays a key role in addressing climate-related portfolio risks. Central banks can help financial markets to price climate risks by giving incentives – such as lower reserve requirements – for those banks more active on climate finance.



- Climate policies can create better jobs and technologies, but job opportunities and income could decrease in certain regions and sectors. Such negative outcomes should be assessed ex-ante and inform social dialogue to help developing and implementing just transition initiatives. Economic, industrial and enterprise policy should complement and accompany the green structural change while protecting workers and jobs. Climate protection is a global public good and as such might induce a free-riding behaviour that demands foreign and commercial policy instruments. A global policy framework should be developed and adapted to each country's context, in consultation with social partners, to adjust economic policy instruments to address the impact of climate transition on labour markets and the business environment.

Background

The ILO *Guidelines for a Just Transition towards Environmentally Sustainable Economies and Societies for All* (hereafter the Just Transition Guidelines), adopted by representatives of governments, employers' and workers' organizations in 2015, provide a policy framework and an operational tool to address environmental change in a way that advances social justice and promotes decent work creation.¹ This policy brief is part of a series of briefs that seek to deepen the technical and policy understanding of the application of the Just Transition Guidelines. They are mutually reinforcing and together form a body of policy guidance on the Just Transition Guidelines.

The just transition briefs are intended for use by policymakers and practitioners at all levels to provide practical information and guidance, fostering a common understanding of what is meant by a just transition in specific topic areas and providing recommendations for implementation by countries, international institutions and other actors in academia and civil society. The briefs seek, in particular, to provide guidance on just transition to ILO constituents, including workers' organizations,

employers' organizations, and governments and relevant line ministries.

The briefs cover the following thematic areas: macro-economic and growth policies; industrial and sectoral policies; active labour market policies; enterprise policies; skills development; green works; occupational safety and health; social protection; rights; social dialogue and tripartism; collective bargaining; labour migration and human mobility; indigenous peoples; gender and labour; youth employment; persons with disabilities; persons with HIV/AIDS; and financing a just transition.

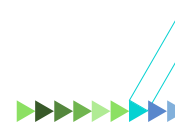
This policy brief is intended to present the linkages between just transition and macroeconomic and growth policies, providing stakeholders with information and recommendations for implementation. The broad implementation of just transition across all policy areas and cross-cutting thematic topics requires careful consideration of the guidance provided in the ILO Just Transition Guidelines, taking into account the needs, priorities and circumstances of each country.

1. Introduction

The Conference of Parties to the United Nations Framework Convention on Climate Change (COP26) took place in November 2021 in a political environment of heightened uncertainties due to

the COVID-19 pandemic and ever-growing concerns of global warming. The Sixth Intergovernmental Panel on Climate Change Assessment Report warns that the recent changes in the climate system are

¹ ILO. *Guidelines for a Just Transition towards Environmentally Sustainable Economies and Societies for All*, 2015.



“unprecedented” and are irreversible for centuries.² In 2019, the CO₂ concentration in the atmosphere reached its highest level while temperatures continued to rise, increasing the likelihood of climate disasters and permanent negative shocks and forcing policymakers to simultaneously pursue climate mitigation and adaptation goals. Macroeconomic and growth policy should smooth the impact of these shocks on the economy, but also ensure a just transition in labour markets. Importantly, a just transition requires consultation with social partners to create decent work while supporting workers and enterprises in adaptation.³

To achieve these results, a large portfolio of green instruments needs to be part of the policy toolbox. These instruments support carbon emission reduction goals by inducing, for example, the investment in green energy, clean transport, and cleaner production practices but also help protect economies from climate shocks. Climate disasters and transition risks are likely to reduce growth, create poverty traps, inflation, limit fiscal space and worsen labour markets.⁴ Financial market losses and instability, due to fossil fuel-stranded assets, can also constrain credit flows and reinforce a downturn cycle.⁵ Recently, climate stress tests undertaken by the European Central Bank (ECB) found that climate-related portfolios are 30 per cent more likely to default and that climate risks can generate 12 per cent of losses to European GDP.⁶ The use of green fiscal, financial and monetary policy as well

as foreign and commercial policy plays a key role in addressing these risks.

However, green transformation will impact the sectoral distribution of jobs, labour productivity and supply.⁷ Climate policies can create better jobs and technologies, but job opportunities and income could decrease in certain regions and sectors. Those negative outcomes may lead to political constraints for climate policy implementation. A lack of the required skills may also reduce the benefits from green investment. Labour market structural changes should be monitored by policymakers to help developing and implementing just transition initiatives.⁸ Economic policy should also be coordinated with alternative instruments to benefit enterprises' business environment while protecting workers and jobs.

This should be considered in the current efforts to recover from the COVID-19 crisis. A growing number of proposals for recovery economic plans have been released to create green jobs, based on green public and private investments such as renewable energy, green buildings, and clean transport.⁹ The economies should not recover from the COVID-19 shock in a way that fosters future climate risks. However, current instruments are insufficiently climate-aligned and still burden labour costs: in OECD countries, for example, the average tax wedge was 34.6 per cent of labour costs in 2020 while carbon taxation initiatives are still scattered.¹⁰ This thematic policy brief

- 2 IPCC, *Climate Change 2021: The Physical Science Basis. Contribution of Working Group 1 to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, 2021. In the last decade, the report says, the global sea level has risen faster and the annual average Arctic Sea ice area has reached its lowest level. Furthermore, evidence of climate-induced disasters, such as heatwaves, floods, droughts and hurricanes, is higher than in 2014.
- 3 See the Just Transition Guidelines.
- 4 Willi Semmler et al., *Fiscal Policies for a Low-Carbon Economy* (World Bank, 2021); Mark Carney, “A Transition in Thinking and Action”, Bank of England speech, 6 April 2018; Benoit Coeure, “The Future of Central Bank Money”, speech at the International Center for Monetary and Banking Studies, European Central Bank, 14 May 2018; Tord Kjellstrom et al., *Working on a Warmer Planet: The Effect of Heat Stress on Productivity and Decent Work* (ILO, 2019).
- 5 Carney, “A Transition in Thinking and Action”; Patrick Bolton et al., “The Green Swan: Central Banking and Financial Stability in the Age of Climate Change”, Bank for International Settlements and Bank of France, Working Paper 5, January 2020.
- 6 Spyros Alogoskoufis et al., “ECB Economy-wide Climate Stress Test: Methodology and Results”, ECB Occasional Paper Series (2021): 281.
- 7 Sandra Batten et al., “Let’s Talk about the Weather: the Impact of Climate Change on Central Banks”, Bank of England Staff Working Paper No. 603, 2016; Mika Kato et al., “Employment and Output Effects of Climate Policies”, in eds. Lucas Bernard and Willi Semmler, *The Oxford Handbook of the Macroeconomics of Global Warming* (Oxford University Press, 2015); ILO, *World Employment and Social Outlook: Greening with Jobs*, 2018.
- 8 Kirsten Svenja Wiebe et al., *Nigeria: Measuring the Socioeconomic Impacts of Climate Policies to Guide NDC Enhancement and a Just Transition*, ILO and UNDP, 2021.
- 9 See OECD, “The OECD Green Recovery Database: Examining the Environmental Implications of COVID-19 Recovery Policies”, 2021 and Cameron Hepburn et al., “Will COVID-19 Fiscal Recovery Packages Accelerate or Retard Progress on Climate Change?”, *Oxford Review of Economic Policy* 36 (2020). The latter surveyed policymakers and experts and found high support for green fiscal policies. See similar proposals have been included in public sector agendas at the international level, in the United States and in Europe. See UNDP, *COVID-19 and Human Development: Assessing the Crisis, Envisioning the Recovery*, 2020; the European Council, *A Roadmap for Recovery: Toward a More Resilient, Sustainable and Fair Europe*, 2020; White House, “President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies”, fact sheet, 22 April 2021; ECA et al., *COVID-19: Towards an Inclusive, Resilient and Green Recovery: Building Back Better through Regional Cooperation*, 2020.
- 10 OECD, *Taxing Wages 2020*, 2021.

discusses green macroeconomic and growth policy instruments, their benefits and risks in practice and their potential impact on labour markets. It suggests that just transition initiatives should complement the

existing economic policy instruments to incentivize private investment but also increase the benefits for workers and labour markets.

2. Green macro policy instruments: an overview

Market failures prevent economic agents from internalizing the costs (and risks) of global warming, leading to excessive carbon emissions.¹¹ A growing literature emphasizes that an appropriate adjustment of macro policy instruments can account for the risks and challenges of climate change.¹² Moreover, climate policy can be successfully coordinated with economic policy goals, with a potentially minimal adverse effect on job creation.¹³

Macroeconomic policy should help properly price the cost of carbon emissions and push a green structural change while pursuing conventional economic goals, such as growth and price stability. A key challenge for climate policies is that it generates financial costs in the present while their benefits accrue to future generations.¹⁴ Furthermore, financial markets do not price correctly long-term climate-related risks and benefits, leading to credit rationing and higher credit costs to green projects.¹⁵ Also, climate services provided by different ecosystems are not reflected in existing financial products, leading to significant geographical inequities regarding costs and benefits of climate policies. New approaches to value ecosystem services allow for a more balanced integration of spatial externalities.¹⁶

In this respect, policymakers can act by de-risking green investments as well as ensuring that financial resources are channelled to create green jobs and technologies, replacing fossil fuels.¹⁷ Additionally, they can help overcome the short-term bias of economic agents to address the long-term consequences of climate change.¹⁸ Both can be achieved through appropriate coordination of macroeconomic policies.

In practice, governments are already adapting economic policy to these new challenges. The use of fiscal instruments, notably, green bonds and carbon pricing, has increased significantly (figure 1). However, the size and multi-dimensional perspective of climate challenges also require alternative instruments. Fiscal policy instruments can lower the competitiveness of countries engaged in climate policy which demands a complementary foreign and commercial policy. Furthermore, credit allocation failures demand the use of financial and monetary policy.¹⁹ These instruments are further discussed in the next sections.

11 William Nordhaus, *A Question of Balance: Economic Models of Climate Change* (Princeton University Press, 2008); Anthony Bonen et al., “Investing to Mitigate and Adapt to Climate Change: A Framework Model”, IMF Working Paper 164, 2016.

12 Sandra Batten et al., “Let’s Talk about the Weather”; Coeure, “The Future of Central Bank Money”.

13 OECD, *Assessing the Economic Impacts of Environmental Policies: Evidence from a Decade of OECD Research*, 2021.

14 Jeffrey Sachs, “Climate Change and Intergenerational Well-being”, in eds. Lucas Bernard and Willi Semmler, *The Oxford Handbook of the Macroeconomics of Global Warming* (Oxford University Press, 2015): 248–259.

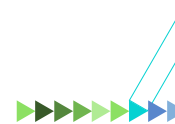
15 George A. Akerlof, “The Market for ‘Lemons’: Quality Uncertainty and the Market Mechanism”, *The Quarterly Journal of Economics* 84, No. 3 (1970): 489–490; Joseph Stiglitz and Andrew Weiss, “Credit Rationing in Markets with Imperfect Information”, *American Economic Review* 71, No. 3 (1981): 393–410; Kenneth J. Arrow and Anthony C. Fisher, “Environmental Preservation, Uncertainty, and Irreversibility”, in *Classic Papers in Natural Resource Economics*, ed. Chennat Gopalakrishnan (London: Palgrave Macmillan, 1974) 76–84.

16 Ralph Chami et al., “On Valuing Nature-based Solutions to Climate Change: A Framework with Application to Elephants and Whales”, Economic Research Initiatives at Duke Working Paper Series, No. 297, 2020, Ekkehard Ernst and Victoria Golz, “Valuing Our Eco-systems: A Case for Blue Carbon and Beyond”, Medium.com, 8 October 2021.

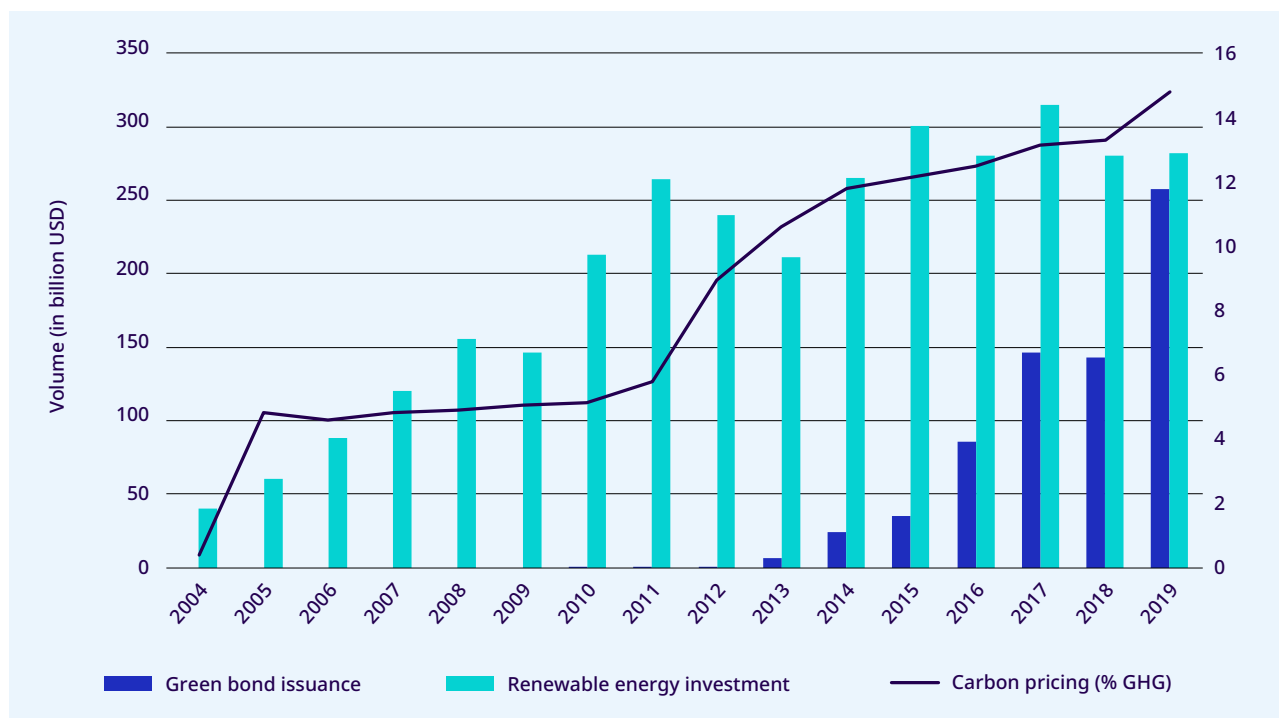
17 Joao Paulo Braga et al., “De-risking of Green Investments through a Green Bond Market: Empirics and a Dynamic Model”, *Journal of Economic Dynamics and Control* Vol. 31 (2021).

18 Semmler et al., *Fiscal Policies for a Low-Carbon Economy*; Carney, “A Transition in Thinking and Action”.

19 Emanuele Campiglio, “Beyond Carbon Pricing: The Role of Banking and Monetary Policy in Financing the Transition to a Low-carbon Economy”, *Ecological Economics* 121 (2016).



► **Figure 1: Use of green bonds, carbon taxation, and renewable energy investment (2004–2019)**



Source: Adapted from Dirk Heine et al., “Financing Low-carbon Transitions through Carbon Pricing and Green Bonds, World Bank Policy Research Working Paper 8991, 2019 and Semmler et al., *Fiscal Policies for a Low-Carbon Economy*.

3. Fiscal policy: instruments, use, advantages, and disadvantages

Fiscal policy relies on the capacity of governments to spend and invest as well as to levy taxation to promote economic policy goals, such as growth and employment. Following existent production patterns, economic growth might increase carbon emissions triggering future economic risks.²⁰ Public investment and procurement, taxes, and subsidies can change those patterns, helping agents to price correctly climate externalities.²¹

Economic theory advocates that carbon pricing instruments, especially carbon taxes, are most effective to accelerate climate transition.²² Carbon pricing internalizes emission costs into

private decisions by imposing a tax on carbon-intensive services and goods (carbon taxation) or by implementing a cap-and-trade (or emissions trading) scheme (ETS). The latter works by setting quantitative allowances to emissions (and emission rights) that are allocated by governments to firms and can be purchased (or sold) in the market in case firms have higher (or lower) effective emission rates.

A relevant number of carbon pricing initiatives can be found in North America and the European Union (EU), but the latter – especially due to the EU ETS – covers a greater share of emissions.²³ Additionally, some middle-income countries, such as China, Chile

20 Esther Sanyé-Mengual et al., “Assessing the Decoupling of Economic Growth from Environmental Impacts in the European Union: A Consumption-based Approach”, *Journal of Cleaner Production* 236 (2019); Claudia Kemfert et al., “Die Corona-Krise darf nicht mit der Befeurung der Klimakrise bezahlt werden”, *Makronom*, 5 May 2020.

21 Arthur Pigou, *The Economics of Welfare*, (Routledge, 1932); Daron Acemoglu et al., “The Environment and Directed Technical Change”, *American Economic Review* 102, No. 1 (2012): 131–66.

22 William Nordhaus, *A Question of Balance*.

23 See [The World Bank Carbon Pricing Dashboard](#). In Europe, 84 carbon pricing initiatives are found at the federal and regional levels.



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and South Africa, have carbon pricing mechanisms. In practice, policymakers seem to prefer ETS.²⁴ ETS initiatives cover 13 per cent of global emissions of advanced countries, while carbon taxation covers 3.6 per cent.²⁵ However, managing such a mechanism is complex. In developing countries with weaker institutions, its effectiveness might be significantly lower.

An ETS demands a complex management system of carbon caps and allowances. In addition, as long as the ETS market is not mature, carbon prices are highly volatile, limiting its effectiveness.²⁶ Additionally, the allocation of carbon allowances may be subjected to political influence, further decreasing the ETS efficacy. The less developed

a country's regulatory and institutional capacity is, the more difficult it is to benefit from these policies and to protect it from such influence. Instead, a carbon tax system relies on the existing tax collection structure.²⁷ However, carbon taxes imply a significant increase in tax rates, which can generate inflation, negative distributional effects, and political resistance.²⁸ Sweden, usually mentioned as a successful case, raised its CO₂ tax to a level greater than US\$100 per ton.²⁹ Carbon taxation is a better solution for a greater variety of countries, but political challenges to implement such taxes might be higher for countries with higher inequality and dependence on carbon-intensive activities.

To overcome these challenges, carbon taxation can be combined with additional public expenditures and green subsidies, compensating for welfare losses and avoiding negative distributional effects. The literature suggests that carbon tax revenues can be channelled to activities with positive externalities, such as green R&D, green infrastructure, or income distribution.³⁰ It could also be used to stimulate labour demand by reducing labour taxes³¹ or through just transition funds, such as the European Union's Just Transition Fund, to finance worker's training and social protection initiatives. Figure 2 estimates potential additional revenues from carbon taxes.

However, strict domestic solutions do not account for these policies' international spill-over effects. Climate protection is a global public good and as such might induce a free-riding behaviour that demands foreign and commercial policy instruments.³² While some countries tackle climate change, others can benefit from these efforts by doing nothing. Moreover, increasing domestic prices of carbon-intensive goods and services will change countries' relative competitiveness and might induce a carbon leakage (polluting activities reallocation) to countries with a loose climate policy.

24 The Kyoto Protocol incentivized the implementation of ETS and allowed Annex I countries to trade carbon in the market. Moreover, the Clean Development Mechanism allowed the generation of GHG certifications from projects, which could be traded to help achieving emission caps.

25 Semmler et al., *Fiscal Policies for a Low-Carbon Economy*.

26 This volatility is also due to the current small size of carbon markets. Edward Nell et al. find that the EU ETS carbon price return volatility is ten times higher than the one of equity investments. (Nell et al., "Economic Growth and Climate Change: Cap-And-Trade or Emission Tax?", in *After Cancún*, eds Elmar Altvater and Achim Brunnengräber, (VS Verlag für Sozialwissenschaften, 2011).

27 Heine et al., "Financing Low-carbon Transitions".

28 Michael Grubb et al., *Planetary Economics: Energy, Climate Change and the Three Domains of Sustainable Development* (Routledge, 2014).

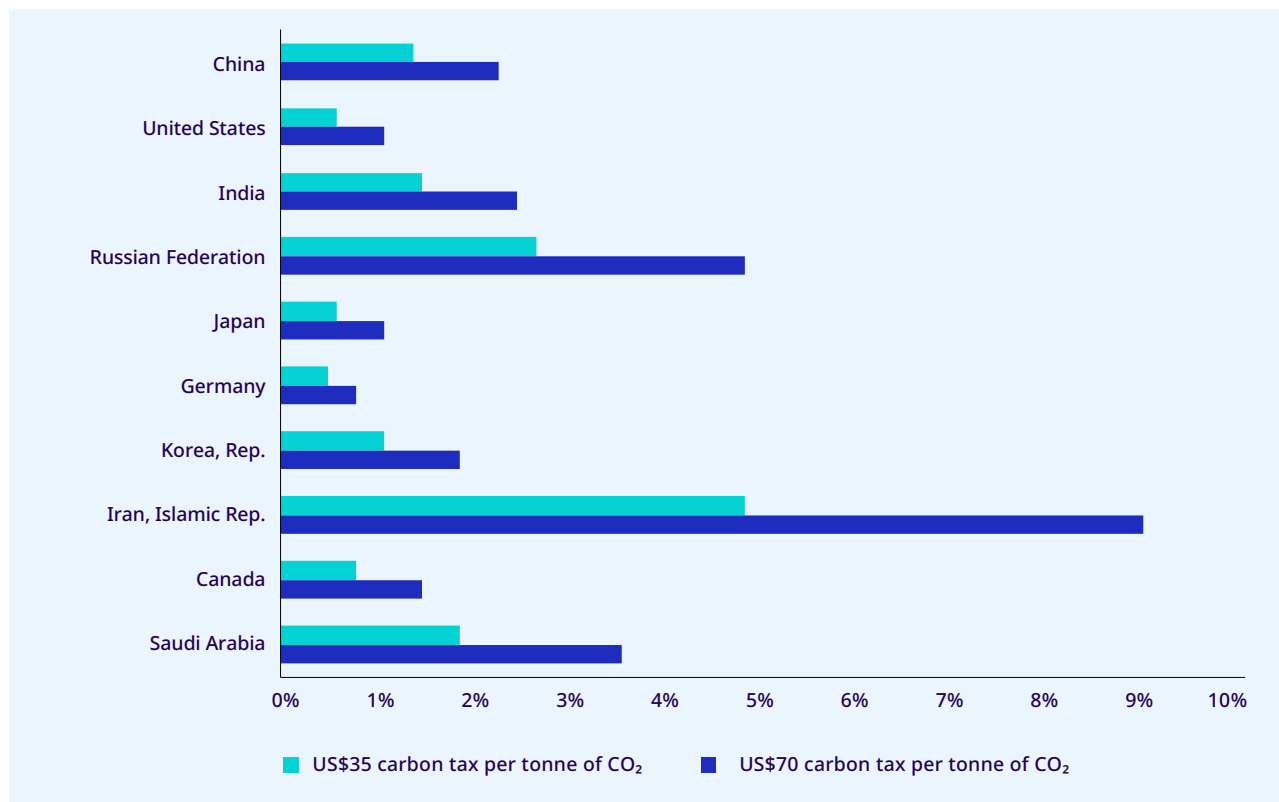
29 Julius J. Andersson, "Carbon Taxes and CO₂ Emissions: Sweden as a Case Study", *American Economic Journal: Economic Policy* 11, No. 4 (2019): 1–30.

30 Acemoglu et al., "The Environment and Directed Technical Change"; Ian W.H. Parry et al., *Getting Energy Prices Right: From Principle to Practice* (International Monetary Fund, 2014).

31 OECD, *Taxing Wages 2020*.

32 Scott Barrett. *Self-enforcing International Environmental Agreements*, *Oxford Economic Papers* 46 (1994): 878–894.

► **Figure 2: Potential additional revenues from carbon taxes in selected countries**



Source: Based on Semmler et al., *Fiscal Policies for a Low-Carbon Economy* and IMF, “Fiscal Policies for Paris Climate Strategies: From Principle to Practice”, IMF Policy Paper 2019/010, 2019.

Nordhaus proposes “climate clubs”, in which members set an international carbon pricing to minimize their joint “social cost of carbon” and penalize non-members with import tariffs.³³ Recently, the EU has announced a Carbon Border Adjustment Mechanism, an attempt to charge carbon-intensive imports the same level of carbon price imposed by the EU ETS. Moreover, the World Trade Organization is already discussing the case of removing barriers and reducing tariffs for green and environmental goods and services.³⁴ Both efforts could add up to existent fiscal policy instruments in incentivizing green investment and protecting green infant industries.

Indeed, a multilateral effort is needed to mobilize international resources for green investment.

Domestic tax revenues alone cannot fully respond to climate challenges.³⁵ The climate finance international architecture already relies on multilateral, regional, and bilateral public funds, some of them proposed by international climate agreements.³⁶ However, green debt or equity instruments – such as green bonds – are also needed to leverage private resources and scale up low-carbon investment.

Green bonds are certified fixed-income debt securities, issued by public or private investors, to leverage resources in financial markets to green investments only (see box 1). There are benefits in combining green bonds and carbon taxation. Green bonds can decrease capital costs while remaining attractive to financial market investors due to their

33 William Nordhaus, “Climate Clubs: Overcoming Free-riding in International Climate Policy”, *American Economic Review*, 105, No. 4 (2015): 1339–70.

34 Angela Ellard, “Trade Plays an Important Role in Climate Change Mitigation and Adaptation”, 26 October 2021.

35 Christine Lagarde and Vitor Gaspar, “Getting Real on Meeting Paris Climate Change Commitments”, IMF Blog, 2019.

36 Climate Funds Updates, “Global Climate Finance Architecture”, n.d.

► Box 1. Green bonds: guidelines and practice

Since the first green bond was issued in 2007, this market has consistently increased (figure 1). In 2020, US\$170 billion in green bonds were issued, according to the [Climate Bonds Initiative](#), contributing to average market growth of 60 per cent per year since 2015.

Green bonds are debt securities, issued in financial markets by public or private agents, to fund green investments, such as renewable energy, clean transport and green buildings. The green bond issuers can be local or national governments, multilateral organizations and development banks, or private or public firms in financial and non-financial sectors. A green bond works exactly like a conventional bond but should be certified by a third party to ensure that the resources are invested on a pre-defined list of climate mitigation or adaptation projects. It mitigates the risk of “greenwashing” and helps to attract climate-aligned investors.

International standards have been released to better classify green investments eligible to be funded by green bonds. There are known global standards, such as those published by the Climate Bonds Initiative and the International Capital Market Association, but also regional ones. The European Union published the “[EU green bond standard](#)” and the “[EU taxonomy for sustainable activities](#)”. China also published its green bond standard. Issuers or audit firms in charge of a green bond classification should follow these rules to ensure a green bond label.

Besides green bonds, other asset classes exist that aim at similar objectives, including social bonds, sustainability bonds and sustainability-indexed funds. These assets differ from green bonds either in their structure or their underlying purpose. All have in common, however, that they include societal objectives beyond purely financial returns.

lower volatility.³⁷ Green bonds can protect investors from climate change risks and future instabilities. After the COVID-19 outbreak, it showed greater resilience than fossil fuel bonds.³⁸

Green bonds can accelerate climate transition, ensure a fairer policy solution, and decrease political resistance against the implementation of carbon taxes. Firstly, it allows current generations to share the costs of climate policy with future generations.³⁹ Second, green bonds increase consumers’ carbon price elasticity, and thus their willingness to switch to a low-carbon solution, by increasing the supply of low-carbon alternatives.⁴⁰ Finally, green investment

can create jobs, lowering the social fall-out from a green transition and thereby decreasing political resistance to climate policy.

However, most micro, small, and medium-sized enterprises (MSMEs) face financial constraints which might prevent them to issue green bonds. These firms face higher capital and transaction costs when accessing banks and financial markets.⁴¹ SMEs’ initial life cycle also demands equity sources, such as seed and venture capital.⁴² Governments already rely on equity funds, FinTechs, or public banks to fund SMEs’ green projects.⁴³ Some of these initiatives are indirectly funded by green bonds.

37 Semmler et al., *Fiscal Policies for a Low-Carbon Economy*.

38 Semmler et al., *Fiscal Policies for a Low-Carbon Economy*; Heine et al., “Financing Low-carbon Transitions.

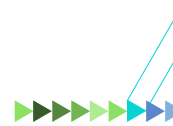
39 Sachs, “Climate Change and Intergenerational Well-being”; Michael Flaherty et al., “Financing Climate Policies through Climate Bonds: A Three Stage Model and Empirics”, *Research in International Business and Finance* 42 (2017): 468–479.

40 Steven Nadel and Cassandra Kubes, “State and Provincial Efforts to Put a Price on Greenhouse Gas Emissions, with Implications for Energy Efficiency”, An ACEEE White Paper, 2019; Jing Hu et al., “Ex-ante Evaluation of EU ETS during 2013–2030: EU Internal Abatement”, *Energy Policy* 77 (2015): 152–163; Semmler et al., *Fiscal Policies for a Low-Carbon Economy*.

41 Bronwyn Hall and Josh Lerner, “The Financing of R&D and Innovation”, in *Handbook of the Economics of Innovation*, Vol. 1, eds. Bronwyn Hall and Nathan Rosenberg (Elsevier, 2010), 609–639.

42 Berger and Udell, “The Economics of Small Business Finance: the Roles of Private Equity and Debt Markets in the Financial Growth Cycle” *Journal of Banking & Finance* 22, issue 6–8 (1998): 613–673.

43 UNEP, *Mobilizing Sustainable Finance for Small and Medium Sized Enterprises: Reviewing Experience and Identifying Options in the G7*. The UN Environment Inquiry, 2017.



Financial market failures can also prevent some countries from issuing green securities. Benefiting from green bonds depends on each country's fiscal space and its access to financial markets. Most of the green bonds are issued in high and middle-income countries.⁴⁴ Several countries, such as Germany, France, Chile and Egypt, have already issued sovereign green bonds and reported lower costs and higher demand vis-à-vis conventional bonds.⁴⁵ However, low-income countries without access to

financial markets can rely on credit from multilateral development banks. Institutions such as the World Bank and the Inter-American Development Bank are among the largest green bond issuers and channel these resources to offer loans and de-risk green investment.⁴⁶ Moreover, other instruments such as public guarantees, sovereign wealth funds (SWFs), and climate multilateral funds can provide additional funding.

4. Financial and monetary policy: instruments, use, advantages and disadvantages

Fiscal policy is key to tackling climate change, but financial and monetary policy should also pursue complementary goals. Climate transition and physical risks will impact carbon-intensive assets and generate financial instability and losses to financial markets.⁴⁷ Those risks involve balance sheet losses due to disasters, technology and market risks (such as a change in consumer behaviour and the emergence of new green technology and sectors) or policy and regulatory risks (as governments and regulators will adjust instruments to penalize fossil fuel firms). Additionally, climate change will affect monetary policy effectiveness, as it impacts conventional central bank (CB) targets, such as inflation and output gap.⁴⁸ Finally, to address market failures in private credit allocation, policymakers can channel credit flows to climate-friendly projects.⁴⁹ Taken together, these challenges demand the involvement of financial regulators and CBs.

CBs are already part of the global climate agenda, but their role is still under discussion. The Network for Greening the Financial System (NGFS) and the

Sustainable Banking Network (SBN) are international networks, composed by CBs from advanced and developing countries, to propose and accompany green monetary and financial policy initiatives. However, concerns have arisen regarding the fear that contributing to climate goals harms CBs' independence, affecting its monetary policy decisions or inducing micro reallocation of financial resources.⁵⁰ Moreover, CBs are more constrained in terms of reserve management regarding the asset classes they can invest in.⁵¹ However, CBs' mandates already allow climate actions: both climate change and climate change policies affect conventional CB targets ("transition risk"),⁵² and some CBs already have mandates to support the government's economic policy (such as the ECB) or climate transition (such as the Bank of England).⁵³

Regardless of explicit mandates, CBs and financial regulators are already adjusting their instruments to account for climate challenges. The majority of such initiatives rely on financial policy instruments (table 1). Financial policy is related to regulation and

44 Braga et al., "De-risking of Green Investments through a Green Bond Market".

45 The Government of Chile reports a lower interest rate for sovereign green bonds (Government of Chile, "Chile Obtains Historical Yields in Euro and US Dollar Green Bond Issuances", 22 January 2020). The German sovereign green bond was five times oversubscribed leading to lower yields (Bloomberg, "Germany's Debut Five-Year Green Bond Meets Tepid Demand", 4 November 2020).

46 Braga et al., "De-risking of Green Investments through a Green Bond Market".

47 Carney, "A Transition in Thinking and Action".

48 Coeure, "The Future of Central Bank Money".

49 Campiglio, "Beyond Carbon Pricing".

50 Yves Mersch, "Climate Change and Central Banking", speech at ECB Workshop "Sustainability is Becoming Mainstream", Frankfurt am Main, 27 November 2018; Robert Skidelsky, "Should Central Banks Have a Climate Mandate?" Project Syndicate, 19 July 2021.

51 Eric Bouye et al., *Environmental, Social, and Governance Investing: A Primer for Central Banks' Reserve Managers* (World Bank, 2021).

52 See, for instance, Donata Faccia et al., "What We Know about Climate Change and Inflation", VoxEU/CEPR, 12 November 2021.

53 UK House of Lords, *Quantitative Easing: a Dangerous Addiction?* Economic Affairs Committee, HL Paper 42, 16 July 2021. For a comprehensive survey on central banks mandate and climate goals, see Simon Dikau and Ulrich Volz, "Central Bank Mandates, Sustainability Objectives and the Promotion of Green Finance", *Ecological Economics* 184 (2021).

► **Table 1: Financial policy instruments – recent experience**

| | |
|--|---|
| Assessment of climate-related risks and Climate stress tests | De Nederlandsche Bank (Netherlands), Bank of England, ECB, and Banque de France. |
| Requirement of climate risk disclosure or assessment | Banque de France, Bank of England, ECB, Reserve Bank of New Zealand, People's Bank of China, Swiss National Bank, and Central Bank of Brazil. |
| Green criteria to adjust reserve requirements or capital and exposure restrictions | People's Bank of China, Bank of Bangladesh, and Bank of Liban. |
| Regulation and guidelines for green financial markets | European commission green investment taxonomy and green bond standards; People's Bank of China Green Bond guidelines. |

Source: Based on reports from CBs, NGFS and SBN and Campiglio, "Beyond Carbon Pricing".

supervision initiatives to ensure financial stability and improve financial markets. In climate policy, it refers to micro and macro-prudential instruments to protect financial markets from climate risks or tools to promote and regulate green asset markets.

Green financial policy instruments aim at inducing the financial sector to better manage climate risks. Some regulators are asking banks to add climate risks to their conventional risk assessments and disclosing their portfolio's carbon footprint and exposure to climate-related assets and loans. France has obliged institutional investors to report their climate-related exposure while the Bank of England announced that climate risk assessments will be mandatory. Banks can follow standards such as the Greenhouse Gas Protocol or the UN Principles of Responsible Investment. Additionally, policy can induce banks to commit to portfolios' carbon footprint reduction goals and to demand the same from corporate lenders, regulating it, for example, through the "Science Based Targets" initiative patterns.

At the same time, several central banks are undertaking climate stress tests. These tests can be micro or macro-prudential-oriented (if focused on individual firms' and banks' vulnerabilities or the whole financial system) and measure, based on future emission scenarios, the potential losses in case of climate disasters or climate-related structural changes that affect fossil fuel firms and their likelihood of default. The Banque de France and the

Bank of England have published, in 2021, new climate stress test methodologies.

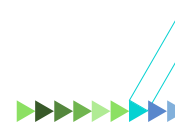
Furthermore, CBs can help financial markets to price climate risks by giving incentives – such as lower reserve requirements – for those banks more active on climate finance. In China, banks can pay a higher interest rate on required reserves, depending on their internal green assessment of climate risks. The Bank of Bangladesh allowed lower equity margin requirements for climate-friendly projects. Government's current efforts in setting standards and regulating green security markets complement these incentives. The ECB, for example, had an important role in setting the European Commission guidelines for green financial markets.

In addition to financial policy, CBs are adjusting monetary policy instruments, which are those related to the CB balance sheet and with a direct impact on credit flows (table 2). A green monetary policy favours green credit flows instead of fossil fuels. An example is the adjustment of large-scale quantitative easing programmes (QE) by greening CBs' asset purchases and portfolios. QE helped reduce capital costs by decreasing the yields of purchased bonds.⁵⁴ If CBs' purchases are carbon-biased, as evidence shows, monetary policy favours carbon-intensive sectors and accelerates climate risks.⁵⁵

Critics of this proposal advocate that asset purchases should be market neutral and not foster micro

54 Michael A.S. Joyce et al., "The Financial Market Impact of Quantitative Easing in the United Kingdom", *International Journal of Central Banking* 7, No. 3, (2011): 113–161.

55 Yannis Dafermos et al., *Decarbonising is Easy: Beyond Market Neutrality in the ECB's Corporate QE* (New Economics Foundation, 2020).



► **Table 2: Monetary policy instruments – recent experience**

| | |
|---|---|
| Climate mandate | Bank of England, The South Africa Reserve Bank, and The Monetary Authority of Singapore. |
| Green criteria to select bonds and equity holdings in CB's own or third-party portfolio | The Bank of Korea, Banque de France, De Nederlandsche Bank (Netherlands), Norges Bank (Norway), Sweden's Riksbank, ECB, Banque D'Italia, and Bundesbank (German). |
| Green quantitative easing | ECB and Bank of England (announcement, but not implemented yet). |
| Green criteria to reserve requirements | Bank of Liban and People's Bank of China. |
| Lending quotas or incentives with climate guidelines | Reserve Bank of India, Bangladesh Bank, Central Bank of Brazil, Bank of Japan, and Nemzeti Bank (Hungary). |
| Green collateral framework | People's Bank of China, and ECB. |

Source: Based on CBs', NGFS, and SBN reports and Campiglio (2016).

reallocation of assets.⁵⁶ Though, the ECB and the Bank of England have announced in 2021 the intention of increasing green bond purchases and adding climate criteria to their asset purchases.⁵⁷ Additionally, other CBs have already implemented negative (or positive) screening to divest carbon-intensive assets (or to invest in climate-related assets). The Bank of Korea has excluded companies with low ESG ratings from its portfolio of foreign currency assets. The Banque de France uses negative screening to align its portfolios with a 2°C warming trajectory.

CBs' actions should be coordinated with other public asset holders. According to the Global SWF Data Platform, pension and sovereign wealth funds (SWF) hold roughly US\$31 trillion in assets. Long-term institutional investors are important players in the green bond market.⁵⁸ However, although SWFs are increasingly aware of climate risks, only 12 per cent have a "specific climate change framework in place" and only 29 per cent have more than 10 per cent of climate-aligned securities in their portfolios.⁵⁹ In 2021, Norway's wealth fund announced steps to fully divest oil-related securities, and a plan to induce firms to pursue net-zero emissions is under

discussion.⁶⁰ However, some of the largest sovereign funds are located in fossil fuels exporters countries, such as Kuwait, Abu-Dhabi and Qatar.

Meanwhile, monetary policy can also improve collateral frameworks and credit allocation criteria to increase credit flows to green initiatives. Bank reserve requirements can be relaxed if banks' exposure is higher to green activities. In 2010, the Banque du Liban reduced reserve requirements by 100 per cent to 150 per cent of the value of loans to green projects. CBs can also set restrictions and quotas on carbon-intensive assets or incentives for loans to sustainable investment. The Bank of Japan offers loans at a lower interest rate for banks that lend to climate projects. The Bangladesh Bank and the Reserve Bank of India imposed a minimum proportion of bank lending to climate projects. Finally, CBs can provide liquidity to the banking system based on a green collateral framework. Since 2018, the People's Bank of China has allowed green bonds as collateral to their lending facility operations. Recently, the ECB announced the use of sustainable-linked bonds as collateral to Eurosystem credit operations.

56 Mersch, "Climate Change and Central Banking".

57 The Bank of England announced in May 2021 that will account for the climate impact of their holdings. The ECB, in July 2021, announced that is considering climate risks in due diligences for its corporate asset portfolios and will incorporate climate criteria for purchases.

58 Ivan Sangiorgi and Lisa Schopohl, "Why Do Institutional Investors Buy Green Bonds: Evidence from a Survey of European Asset Managers", *International Review of Financial Analysis* 75 (2021).

59 IPSWF and OPSWF, *Mighty Oaks from Little Acorns Grow: Sovereign Wealth Funds' Progress on Climate Change*, 2021.

60 Bloomberg, "Norway's \$1.4 Trillion Wealth Fund Set to Get Strict CO2 Mandate", 26 September 2021.

5. Implications for labour markets

The creation of green jobs entered policymakers' agenda through the rising numbers of green economic policy instruments and green recovery plans to deal with the COVID-19.⁶¹ In practice, however, only roughly 20 per cent of these resources have been channelled to green initiatives.⁶² Environmental goals have historically been perceived as a constraint to growth and estimating the economic impact of green economic policy is still a challenge.

There is evidence that an active green fiscal policy contributes to job creation but assessing the impact of climate policy on labour markets demands understanding each country's structure and climate challenges. The "Green Jobs Assessment Institutions Network" studies different green employment impact assessment methods - from macro and econometric to input-output models.⁶³ An input-output model was recently applied for the case of Nigeria and Zimbabwe⁶⁴ and a macro-econometric general equilibrium model (Cambridge's E3ME energy-economy-environment model) was applied for COVID-19 green recovery plans.⁶⁵ These studies show that a green fiscal policy benefits employment, but its relative effectiveness is higher in the long-term and for certain sectors and places. Benefits might be lower, for example, where fossil fuel industries play a more important role in the energy mix of a country.

Other recent studies add to these findings, showing that a green active fiscal policy has a higher employment multiplier effect than conventional ones. Garret-Peltier finds that each US\$1 million shifted from fossil fuels to renewable energy

creates five additional jobs.⁶⁶ If the same amount is invested in green energy, it creates 7.5 direct and indirect jobs (versus 2.7, when invested in fossil fuels). Green investment is more labour-intensive and demands a higher domestic content. Batini et al. find that the multiplier for renewable energy investment can be up to 1.5 while, for fossil fuels, up to 0.6.⁶⁷ The authors also find a larger multiplier for green land-use investment (versus non-eco-friendly investment) as large-scale agriculture is dependent on imported chemical inputs and high-cost machinery.

Therefore, these results depend on the sectoral distribution of investment and should be interpreted based on each country's context. It provides lessons to green instruments that promote economic structural change, such as carbon taxes and monetary policy. Metcalf and Stock find no robust evidence of a negative impact of a carbon tax on employment and GDP.⁶⁸ Kato et al. find that the most desirable economic outcome is achieved when carbon tax revenues are used to subsidize green initiatives.⁶⁹ Output and employment levels decrease in high carbon-intensive sectors and increase in low-carbon activities with a positive balance on employment creation.

As projected by OECD⁷⁰ emission-intensive sectors – such as coal and mining, fossil fuels, and fossil fuel electricity – and low-skilled positions – such as plant machine operators – will lose jobs. Meanwhile, low-carbon services and industries that are part of green supply chains will face a job increase. Marin and Vona find that, in Europe, climate policies explain up to 17.5 per cent of the increase in the share of

61 Hepburn et al., "Will COVID-19 Fiscal Recovery Packages".

62 OECD, *Assessing the Economic Impacts of Environmental Policies*; Brian O'Callaghan et al., *Global Recovery Observatory*, Oxford University Economic Recovery Project, 2020.

63 ILO, *Modelling a Global Inclusive Green Economy COVID-19 Recovery Programme*, 2017.

64 Wiebe et al., *Nigeria: Measuring the Socioeconomic Impacts of Climate Policies*; Wiebe et al., *Zimbabwe: Measuring the Socioeconomic Impacts of Climate Policies to Guide NDC Enhancement and a Just Transition*, 2021.

65 Richard Lewney et al., *Modelling a Global Inclusive Green Economy COVID-19 Recovery Programme* (Partnership for Action on Green Economy, 2021).

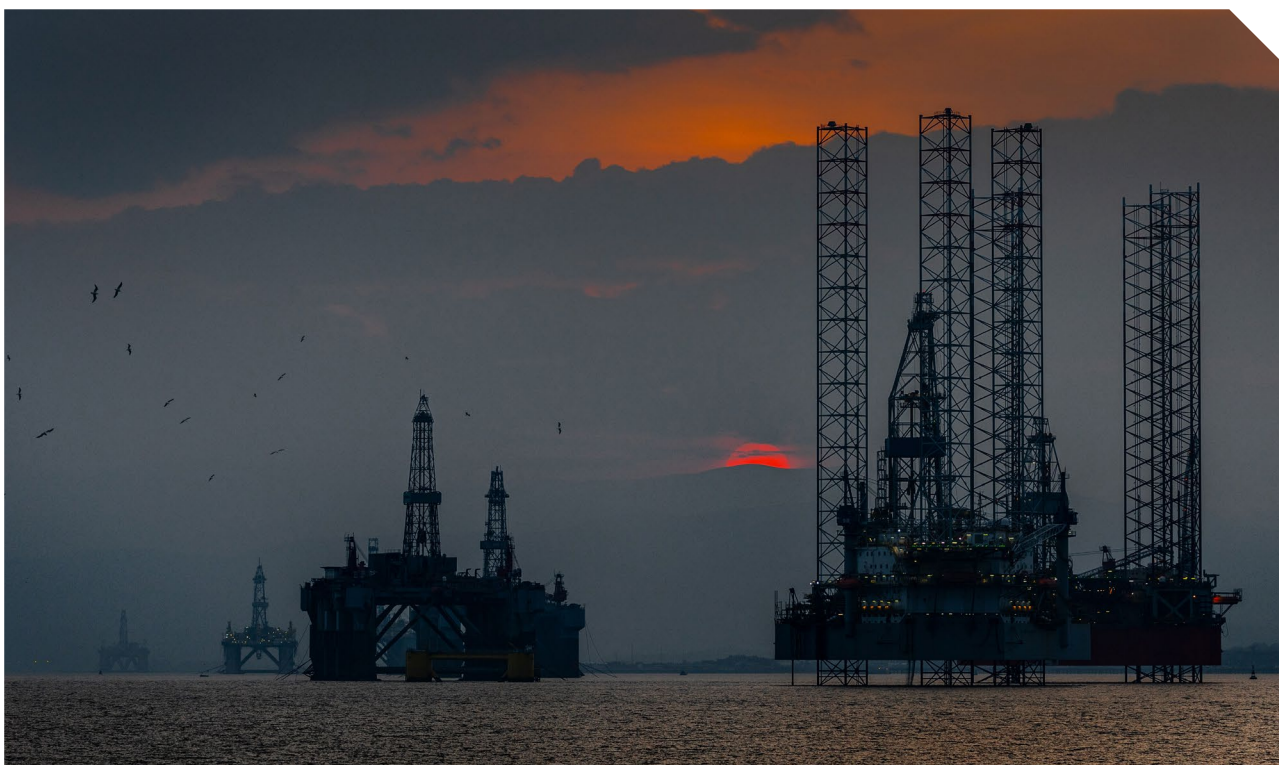
66 Heidi Garrett-Peltier, "Green versus brown: Comparing the employment impacts of energy efficiency, renewable energy, and fossil fuels using an input-output model", *Economic Modelling* 61 (2017) 439–447.

67 Nicoletta Batini et al., "Building Back Better: How Big Are Green Spending Multipliers?", IMF Working Paper No. 87, 2021.

68 Gilbert E. Metcalf and James H. Stock, "Measuring the Macroeconomic Impact of Carbon Taxes", *AEA Papers and Proceedings* 110 (2020): 101–106.

69 Mika Kato et al., "Employment and Output Effects of Climate Policies".

70 OECD, "Impacts of Green Growth Policies on Labour Markets and Wage Income Distribution: A General Equilibrium Application to Climate and Energy Policies", ENV/EPOC/WPIIEP, 2018.



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technicians and up to 8 per cent of the decrease of manual workers.⁷¹ It could lead to a job reallocation between countries and regions if those dependent on fossil-fuel goods do not prepare in advance to attract green investments. Just transition policies can protect workers and communities from climate transition risks, support business continuity and adaptation and ensure that workers acquire the required capabilities to be reallocated for new activities.⁷² Nevertheless, this sectoral shift can lead to an improvement of working conditions as some of these carbon-intensive sectors are associated with higher rates of injuries and diseases demanding tight occupational health and safety.⁷³ However, some green labour-intensive activities – such as low-carbon agriculture and biofuels – might also need adequate regulatory frameworks and compliance to ensure decent wages, avoid informal employment and ban non-desirable practices.

Finally, climate policies will not only directly affect labour markets but also have co-benefits to workers' welfare and health. First, it will induce the reduction of pollutants (also in the workplace) which decreases mortality and diseases.⁷⁴ Second, work accidents are likely to reduce in certain sectors. One example is transport: lower traffic congestion and road accident levels are expected outcomes of carbon taxes.⁷⁵ Third, additional tax revenue from carbon taxation can be channelled to just transition initiatives to protect workers and enterprises from climate transition risks.

71 Giovanni Marin and Francesco Vona, "Climate Policies and Skill-biased Employment Dynamics: Evidence from EU Countries", *Journal of Environmental Economics and Management* 98 (2019).

72 Richard Lewney et al., *Modelling a Global Inclusive Green Economy COVID-19 Recovery Programme*.

73 ILO, "Industries and Sectors", n.d.

74 Raquel A. Silva et al., "Global Premature Mortality Due to Anthropogenic Outdoor Air Pollution and the Contribution of Part Climate Change", *Environmental Research Letters* 8, No. 3, 2013.

75 Parry et al., *Getting Energy Prices Right*.

6. Conclusions and labour policy recommendations

Climate change increases the likelihood of disasters and permanent negative shocks that might affect the economy, generating financial losses as well as GDP and employment reduction. Climate transition will also impact the sectoral distribution of jobs and labour productivity. A green macroeconomic and growth policy should smooth the impact of these shocks on the economy, but also ensure a just transition. A global policy framework should be developed and adapted to each country's context, in consultation with social partners, to adjust economic policy instruments to address the impact of climate transition on labour markets and the business environment. Just transition policies could induce better job creation, business resilience, social inclusion, and inclusive growth. They demand complementary initiatives such as training (and reskilling) programmes, investment in long-term climate projects and green entrepreneurship (to promote green innovation and jobs), improvement of social protection networks and occupational health

and safety conditions and initiatives to help workers' reallocation to green activities.

For this purpose, green fiscal policy needs to be adjusted. Carbon tax revenues should be used to fund initiatives with positive externalities.⁷⁶ These revenues should also fund labour-related initiatives to smooth the climate transition impact on labour markets, including funds such as the European Union's Just Transition Fund. To counter the rise in economic inefficiencies from higher tax rates, fiscal-neutral green tax reforms can minimize distortions.⁷⁷ In particular, a carbon tax could replace or reduce the incidence of known distortionary and regressive labour taxes, reducing labour costs and inequality, and maximizing the reform benefits, as advocated by the "double dividend hypothesis".⁷⁸ To increase the benefits of a just transition in labour markets, economic policy can also be combined with other policy instruments ensuring a fairer green structural change.

76 Daron Acemoglu et al., "The Environment and Directed Technical Change"; Parry et al., *Getting Energy Prices Right*.

77 David Pearce, "The Role of Carbon Taxes in Adjusting to Global Warming", *Economic Journal* 101, No. 407 (1991): 938–948.

78 In Canada, British Columbia's carbon taxation was designed to be revenue-neutral by the combination of increasing carbon taxes with the reduction of regressive taxes to households and small firms and the increase of lump-sum transfers. Evidence shows that this policy impacted positively employment and distribution, although this effect seems small (Akio Yamazaki, "Jobs and Climate Policy: Evidence from British Columbia's Revenue-neutral Carbon Tax" *Journal of Environmental Economics and Management* 83 (2017): 197–216.; Brian C. Murray and Nicholas Rivers, "British Columbia's Revenue-neutral Carbon Tax: A Review of the Latest "Grand Experiment" in Environmental Policy", *Energy Policy* 86 (2015): 674–683). In Australia, an intermediate solution was implemented with a "partially-revenue-recycling" carbon taxation (Jeremy Carl and David Fedor, "Revenue-Neutral Carbon Taxes in the Real World: Insights from British Columbia and Australia", Task Force on Energy Policy, Hoover Institute, Stanford University, 21 December 2012).

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