

Chapter 4

Ensure fiscal sustainability for a low-emission, resilient future

The climate challenge requires governments to align all channels of public finance with climate and growth objectives, while also taking into account medium-term budgetary cycles and longer-term fiscal sustainability. This chapter describes why public budgets play a central role in creating incentives for shifting finance towards low-emission, resilient investments. It describes barriers facing governments as well as the opportunities to be gained from the transition to a low-emission, resilient economy. Four priority actions are identified: diversify government revenue streams away from fossil fuels, align fiscal policies with climate objectives, align incentives and mandates of all public institutions with climate objectives, and anticipate and address the social consequences of the low-emission transition.

Key messages

The power and influence of public budgets, if channelled towards climate objectives, can provide significant momentum towards building a low-emission, resilient economic future. In order to make meaningful progress on climate, there are four priority policy actions:

- Diversify government revenue streams to prepare for carbon neutrality in the long run, and reduce governments' exposure to incumbents and vested interests in fossil fuel technologies.
- Align fiscal and budgetary incentives with climate objectives to discourage emissions-intensive behaviours or investments by economic actors.
- Leverage public procurement practices and indirect spending through state-owned enterprises, development finance institutions, export credit agencies and public investments to align with climate objectives.
- Ensure an inclusive transition along the way, fostering public support for raising climate ambition.

Why is better public budgeting transformative?

The way governments choose to raise and spend money is decisive in delivering the low-emission, resilient transformation needed. The climate challenge requires governments to align all channels of public finance with climate and growth objectives, while also taking into account medium-term budgetary cycles and longer-term fiscal sustainability.

Through their budgeting processes, policies and fiscal incentives, governments play a central role in directing financial flows and influencing climate-related behaviours of citizens, financiers and businesses. What governments put a price on and what they choose to support financially – for example through carbon pricing and support for renewables – can provide the signals needed to leverage and shift private sector investments towards low-emission and resilient investments.

Reforming the spending policies of public entities can have major impacts on the way in which public expenditures influence climate outcomes. For example, ensuring that the mandates of state-owned enterprises (SOEs), development co-operation agencies, export credit agencies and public investment funds are compatible with climate goals can be a powerful and transformative action. Similarly, the experience of “greening” public procurement processes can be effective in driving innovation and the uptake of new technologies.

Without coherent action, governments – particularly those reliant on fossil fuels as a significant source of revenue – are at risk of not being fiscally sustainable over the long run as fossil fuels are phased out. This not only affects central government revenues, but also the broader economy where businesses, regions and individuals rely on emissions-intensive industries. Countries must be aware of the shifting revenue base that will accompany the low-emission economy. Government revenues will need to adapt to decarbonisation,

implying a structural shift away from reliance on revenues from fossil fuel extraction, production and consumption over the long term.

The economic transition will also result in an increased risk of stranded assets and workers who may require government support to minimise the social impacts of the transition. Acting now allows governments to plan and reshape their economies towards a low-emission, resilient future. It allows regions to lead the way in innovative low-emission industries, while building up the competencies and skills of workers to enable them to be employed in a different economic paradigm.

What is the state of play?

Carbon pricing – recognised as an essential element of the climate public budgeting toolkit – is increasing. The number of carbon pricing initiatives has more than tripled in the last 10 years as more governments at the national and subnational level continue to plan and implement carbon pricing initiatives. To date, 45 national and 25 subnational jurisdictions have implemented, or have scheduled for implementation, carbon pricing initiatives (World Bank and Ecofys, 2018^[1]). This represents 20% of global greenhouse gas (GHG) emissions, up from 15% in 2017. Despite progress, this is not sufficient to meet the goals of the Paris Agreement. Currently, 88% of energy emissions are priced below EUR 30 per tonne of CO₂, which is a low-end estimate of the damage that emissions cause (OECD, 2018^[2]).

On the spending side, while momentum is growing to divest from fossil fuels, global financial support for fossil fuels remains high. Of 76 economies that collectively emit 94% of global CO₂ emissions, aggregate estimates of the annual production and consumption support to fossil fuels ranged from USD 373 billion to USD 617 billion over the period 2010-15 (OECD, 2018^[3]).

What are the barriers and opportunities for change?

Political economy and public acceptability concerns are the main barriers to moving from an incremental approach to greening public budgets to a more transformative approach. Decades of fossil fuel development have led to government budgets becoming “entangled” in carbon emissions. Carbon entanglement refers to the state in which fiscal revenues from fossil fuels (for example, from collecting royalties on the extraction of oil, natural gas and coal) form a key part of governments’ taxation revenue base. This carbon entanglement is an important political obstacle for governments to engage in the radical transformation needed to transition to a low-emission, resilient future. The share of government revenues coming from fossil fuels averages nearly 8% globally. The situation is very different from country to country: for fossil fuel exporters, this figure can represent over 75% of revenues (see Table 4.1).

As governments undertake the transition away from a fossil fuel based economy, they will inevitably face resistance from a range of stakeholders. They will need to pay greater attention to understanding and addressing the social consequences of the structural shift needed of their economies. Considering the distributional impact of climate policies on poor and vulnerable populations will be key for governments in meeting their social objectives and in reducing any undesirable and unintended distributional impacts of such policies. Certain industries will thrive, while others that are dependent on fossil fuels and are not willing or able to adapt to the new low-emission economy may not fare as well. This means that specific regions, workers, industries and investors may be particularly affected. The use of public resources to address these issues is closely linked to fiscal sustainability through the need to ensure that adequate resources are available, well-targeted and focused on

the broad suite of transition measures required (for example, education and reskilling of affected workers).

Table 4.1. Estimated rents from the extraction of oil, natural gas and coal resources

Period average	Billions USD			% GDP			% Total government revenues		
	2001-05	2006-10	2011-16	2001-05	2006-10	2011-16	2001-05	2006-10	2011-16
G20 (excl. EU)	483	1015	1032	1.6	2.3	1.8	4.8	7.1	5.6
Argentina	6	12	11	3.6	3.6	2.0	16.4	13.3	6.1
Australia	8	25	24	1.6	2.7	1.7	4.6	7.9	4.9
Brazil	11	29	37	1.8	1.8	1.6	5.1	5.0	4.9
Canada	35	46	24	3.8	3.2	1.4	9.4	8.1	3.6
People's Republic of China	51	180	184	2.9	4.1	1.9	18.2	18.3	6.8
France	0	0	0	<1	<1	<1	<1	<1	<1
Germany	2	5	3	<1	<1	<1	<1	<1	<1
India	13	37	41	2.2	2.9	2.1	11.9	14.8	10.3
Indonesia	11	27	30	5.0	5.3	3.3	27.1	31.8	22.6
Italy	1	2	3	<1	<1	<1	<1	<1	<1
Japan	0	0	0	<1	<1	<1	<1	<1	<1
Korea	0	0	0	<1	<1	<1	<1	<1	<1
Mexico	27	50	47	3.5	4.9	3.9	17.6	21.1	16.7
Russian Federation	82	195	230	16.9	14.5	12.2	44.8	38.6	33.8
Saudi Arabia	91	205	276	38.7	45.2	39.3	>90	>90	>90
South Africa	5	12	9	2.8	4.0	2.5	11.5	14.5	8.8
Turkey	1	2	1	<1	<1	<1	<1	<1	<1
United Kingdom	17	26	19	<1	1.0	<1	2.3	2.6	1.9
United States	119	162	94	1.0	1.1	<1	3.3	3.8	1.8
Rest of World	304	751	857	3.8	5.4	4.9	3.2	15.8	15.8
OPEC (excl. Saudi Arabia)	178	457	531	26.4	26.9	25.1	30.4	78.0	84.5
World	787	1766	1889	2.0	3.0	2.5	4.0	9.0	7.7

Notes: OECD calculations based on World Bank data on oil, natural gas and coal rents and revenue, excluding grants (% GDP). World Bank's oil, natural gas and coal rents have been estimated based on sources and methods described in Lang, G.-M., Q. Wodon and K. Carey (2018^[4]), *The Changing Wealth of Nations 2018: Building a Sustainable Future*, World Bank, Washington, DC, <https://openknowledge.worldbank.org/handle/10986/29001>.

Source: World Bank (2018^[5]), World Development Indicators (database), <https://datacatalog.worldbank.org/dataset/world-development-indicators>.

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4.1. Diversify government revenue streams away from fossil fuels

Long-term fiscal sustainability is a central consideration for all governments, but is especially important for those with revenues and economies highly dependent on fossil fuels. The carbon entanglement of government budgets is a major barrier to more ambitious climate action as governments may appear to be acting against their own interest in the short term by moving away from fossil fuels. Carbon entanglement presents a significant risk for countries' medium- to long- term fiscal sustainability as they transition to low-emission economies. Given that declining production and consumption of fossil fuels is a key element of projected decarbonisation pathways to meet the Paris Agreement goals, the prospect of declining tax revenues from fossil fuels raises serious and growing concerns about the future tax base and tax mix.

A successful and decisive transition away from carbon entanglement hinges on effective and strategic planning and is best if done from a position of relative economic strength when international energy prices are high. It will require diversification away from fossil fuels by committing to alternate energy sources and rethinking economic features such as workforce skills, education and training institutions, and infrastructure.

Box 4.1. Momentum is growing to divest from fossil fuels

An increasing number of public and private actors have committed to remove investment capital from fossil fuel companies. Some of these pledges have focused exclusively on coal or the most emissions-intensive upstream activities – such as exploitation of oil sands – or the most potentially disruptive to fragile ecosystems – such as greenfield developments in the Arctic. Others have opted to divest from companies with large stakes in the oil, gas or coal industries in general.

National funds

- Dáil Éirann, the lower house of Ireland's parliament, approved a bill mandating the divestment of all fossil fuel company assets managed by the Ireland Strategic Investment Fund by 2023 (Oireachtas, 2016^[9]). If parliament's upper house approves the bill, Ireland will need to divest EUR 318 million of the fund's total EUR 8 billion (Carrington, 2018^[10]). Ireland's motivations were explicitly climate-related.
- In 2017, Norway's central bank recommended that the Government Pension Fund Global, the world's largest sovereign wealth fund managing over USD 1 trillion, divest from oil and gas stocks (Olsen and Slyngstad, 2017^[11]). Unlike the case of Ireland, risk minimisation was the motivation behind Norway's decision.

Cities

- Over 100 municipalities of varying sizes across the globe have also committed to divest including cities and towns in Australia, Denmark, France, Germany, Liberia, the Netherlands, New Zealand, Norway, South Africa, Sweden, the United Kingdom and the United States (Go Fossil Free^[12]). Some have committed to full divestment from all fossil fuel company assets, while others aim to divest partially.
- New York City has set an objective to divest USD 5 billion of fossil fuel company assets from its USD 189 billion pension funds within the next five years (Milman, 2018^[13]). Other major cities that have committed to divestment include Auckland, Berlin, Bristol, Cape Town, Copenhagen, Melbourne, Paris, San Francisco, Stockholm and Sydney – as well as Oslo's pension fund (Go Fossil Free^[12]).

Broadening the tax base, for example by diversifying economic activity, will also be essential to move away from an emissions-intensive economy. As the fossil-fuel tax base erodes, governments will need to compensate for such loss by identifying new streams of revenue, such as the taxation of environmental externalities. In the area of carbon tax, there is significant space for broadening the tax base and increasing rates and, in the short to medium term, this may help to bridge the gap in revenues. However, this will not be sufficient in the long term as emissions decrease, and with it, the tax base. New business models and diversifying economic activity are therefore crucial for expanding the government revenue base to ensure fiscal and economic sustainability.

There are some examples of this in practice:

- Norway manages its oil wealth through a sovereign wealth fund, which has helped citizens achieve high living standards and reduced the country's exposure to fluctuations in the oil price, while also diversifying its economy away from fossil fuel dependence.
- Scotland is aiming for a shift towards an electricity system entirely dependent on renewable energy by 2020. Since 2006, it has seen a four-fold increase in the proportion of electricity

coming from renewables (Government of Scotland, 2018^[6]). The transition has had a positive impact regionally, as it included explicit targets for locally-owned power generation plants.

- The state of California, despite being the third-largest producer of oil and gas in the United States, has joined Hawaii in legislating that all electricity be carbon neutral by 2045 (California Energy Commission^[7]).
- The United Arab Emirates, the fifth-largest OPEC producer, has committed to diversifying its economy away from oil and natural gas, and sourcing a greater proportion of its electricity from renewables (Government of the UAE^[8]).

The twin issues of carbon entanglement and long-term fiscal sustainability are only just beginning to be discussed in government finance ministries (see Box 4.1), yet they are central to the success of the transition to low-emission, resilient economies. There is considerable scope for deepening the debate on this issue and boosting the evidence base to inform future government actions.

4.2. Align fiscal policies with climate objectives

Aligning fiscal policies with climate objectives has long been seen as a core element of the transition to a low-emission, resilient economy (OECD, 2015^[14]). Revenue-raising mechanisms, such as carbon pricing, have direct links to climate objectives by shifting behaviours and investments away from emissions-intensive behaviour, and towards innovation in low-emission technologies. Some budgetary support measures, such as fossil fuel subsidies, have the opposite effect by encouraging the production and consumption of fossil fuels and related infrastructure. However, governments should look beyond these core climate policies to ensure the entirety of their fiscal framework are working in unison to achieve a low-emission, resilient future.

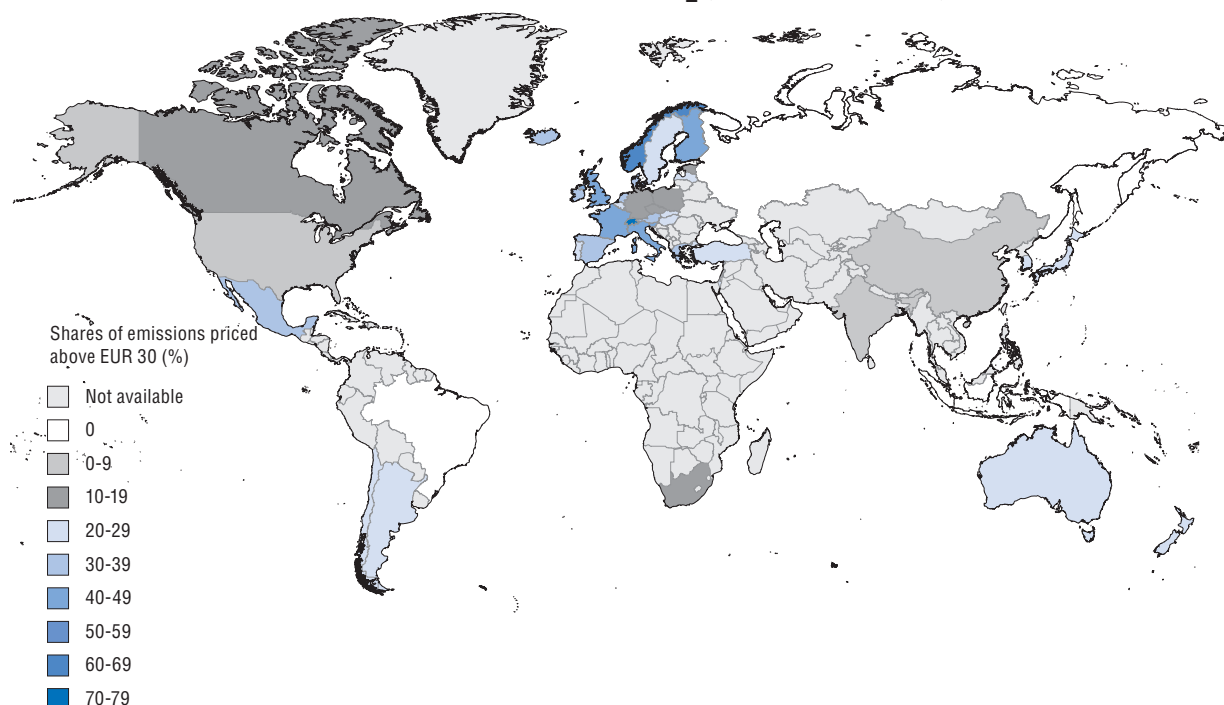
Strengthen carbon pricing

Carbon pricing has proven to be a cost-effective climate policy tool if appropriately implemented, and can also offer governments an important revenue-raising opportunity. While the number of carbon pricing initiatives is growing worldwide (World Bank and Ecofys, 2018^[1]), there is significant room for improvement (see Figure 4.1).

Exemptions from carbon pricing undermine abatement efforts and increase the overall cost of achieving climate objectives. Looking at the effective carbon price from energy reveals that close to half of CO₂ emissions are not priced at all (OECD, 2018^[2]). In most sectors other than road transport (which accounts for 16% of total emissions), a greater proportion of carbon emissions could be priced at a sufficiently high level to induce abatement. The High-Level Commission on Carbon Prices recommends USD 40-80 per tonne CO₂ by 2020 as a range compatible with meeting Paris Agreement goals (2017^[15]). Where applicable, countries could increasingly seek to co-ordinate cross-jurisdictional pricing schemes in order to decrease the risk of carbon leakage¹ (Lanzi et al., 2013^[16]).

Carbon pricing offers governments an important revenue-raising opportunity. The World Bank Group estimates that governments raised approximately USD 33 billion in direct carbon pricing revenues in 2017, an increase of USD 11 billion from 2016 (World Bank and Ecofys, 2018^[1]). Governments have many options at their disposal for using the revenues raised from carbon pricing (see Table 4.2). As with any policy, each of these options requires careful consideration of their respective opportunities and trade-offs depending on the specific circumstances of their jurisdiction. Communicating the use of carbon-pricing revenues, so that citizens can observe the benefits, may assist in reducing resistance to carbon pricing initiatives.

Figure 4.1. **Few countries price a significant share of their energy emissions above EUR 30 per tonne of CO₂ (estimate for 2018)**



Source: OECD (2018^[2]), *Effective Carbon Rates 2018: Pricing Carbon Emissions through Taxes and Emissions Trading*.

Table 4.2. **Examples of carbon pricing revenue uses**

	Example
Reduce other taxes	Since introduction of the tax in 2008, British Columbia's uses of carbon tax proceeds include business tax cuts and tax credits, personal income tax cuts (targeted at lower income categories), low-income tax credits and reductions in property taxes
Directing revenues to households	In California, state law stipulates that at least 25% of auction revenues from the state's cap-and-trade programme go to projects that benefit disadvantaged communities – such as the Affordable Housing and Sustainable Communities Program
Providing transitional support to industry	The United Kingdom's national Climate Change Levy addressed the concern of businesses about how they might adjust to potentially higher energy costs
Reducing public debt and/or deficit	The 2010 introduction of the Irish tax on carbon pollution raised much-needed revenue and may have avoided the necessity for even harsher fiscal tightening measures during the economic downturn
Using revenues for general spending	In the EU Emissions Trade System, 9 out of 28 member states (including for example Denmark, Finland, Ireland, Poland, Sweden and the United Kingdom) have opted to direct their auction revenues to their respective national treasuries
Providing funding for climate investments	In Alberta, Canada facilities can directly contribute to the province's Climate Change and Emissions Management Fund as one of the four compliance options under the Specified Gas Emitters Regulation. The fixed fee of CAD 15 per tonne of CO ₂ is then used in this dedicated fund to achieve further emissions reductions in Alberta and help the province to adapt to climate change through green technology and innovative solutions.

Source: Adapted from CPLC (2016^[17]), *What Are the Options for Using Carbon-pricing Revenues?*, Carbon Pricing Leadership Coalition.

Remove fossil fuel support

A number of budgetary support measures, such as fossil fuel subsidies, still favour emissions-intensive behaviours and practices. Removing inefficient fossil fuel subsidies offers the dual benefit of addressing environmental objectives through the reduction of emissions, while also reducing tax expenditures and simplifying the tax code. Multilateral fora including the G7, the G20 and Asia-Pacific Economic Cooperation (APEC) have all called to reduce inefficient fossil fuel subsidies. Progress is being made; there has been a sustained downward trend in fossil fuel subsidies, partly as a result of falling oil prices as well as reforms by countries such as Mexico and Indonesia. Further progress is expected from the countries that have identified opportunities to remove inefficient subsidies through

APEC or G20 fossil fuel subsidy peer reviews. Fourteen countries have already undergone a review, and Argentina and Canada have committed to undergoing one (IISD, 2018^[18]).

Some countries have begun to phase out fossil fuel support measures, but such reforms must be scaled up, mainstreamed, and become part of a more holistic approach to aligning fiscal policies with low-emission outcomes. Finance ministries should carefully review their tax systems, and ensure that taxes and budgetary expenditures are in line with sectoral decarbonisation objectives. A central component of this is to craft fiscal policies that encourage, rather than counteract, the behaviours, investments and practices needed for the radical transformation to move towards a low-emission economy.

Many fossil fuel support measures were introduced prior to 2000 (OECD, 2018^[3]). Countries would benefit from critically reviewing their relevance and effectiveness in meeting their policy objectives, particularly in light of climate change, increasing recognition of climate risks, more competitive prices of renewable technologies, and a shift in citizens' priorities. Further work could also be done to create a better understanding of definitions and data on subsidies. Countries require an accurate understanding of the primary impacts on budgets and consumers, in order to effectively reform fossil fuel subsidies. The fossil fuel subsidy peer-review process initiated through APEC and the G20 provides a measure of transparency and an important opportunity for peer learning in identifying and proposing options for the removal of harmful subsidies.

Bring public budgets in line with climate objectives

Beyond direct actions focused on carbon emissions, governments should focus on ensuring that the entirety of their budgetary process is aligned with climate objectives. This can have powerful transformative impacts on the behaviours of consumers and producers, sending political signals on the direction of change, influencing individual and company consumption and production patterns, and leveraging private sector resources for the low-emission transition. The power of this area is yet to be fully realised by governments and there is considerable scope for scaling up activities on public budget alignment.

For example, many countries' fiscal policies provide favourable tax treatment for the use of company cars and commuting expenses, which indirectly results in more cars and more intensive car use. Certain property taxes favour urban expansion and therefore increase commuting distances (see Chapter 7). Corporate tax provisions may also encourage or discourage decarbonisation, for example due to the way corporate taxation allows deductions for different types of capital costs (Dressler, Hanappi and van Dender, 2018^[19]). Initiatives such as the Paris Collaborative on Green Budgeting (see Box 4.2) and the Green Fiscal Policy Network aim to align government budgets with environmental and climate goals through fiscal policy reform.

Calculating the full costs of emissions using cost-benefit analysis (CBA) could shift finance towards low-emission, resilient projects. CBA can capture individual projects' climate impact using the social cost of carbon, which measures the present value of the damage resulting from an additional tonne of carbon emissions – or emissions of any other greenhouse gas. For example, particulate matter, sulphur dioxide, nitrous oxides and carbon monoxide can be included in CBAs of transport and energy projects. Environmental CBAs can also capture positive and negative well-being impacts, and can help provide a more holistic picture to decision makers by capturing the co-benefits of low-emission, resilient infrastructure, such as improved air quality, improved access to transport, less traffic congestion and better health (OECD, 2018^[20]).

Box 4.2. The Paris Collaborative on Green Budgeting

The Paris Collaborative on Green Budgeting was launched by the OECD as part of the 12 announcements presented by French President Emmanuel Macron at the 2017 One Planet Summit in Paris. It aims to support governments to assess and drive improvements in the alignment of national expenditure and revenue processes with climate and other environmental goals and to mainstream an environmentally aware approach across all policy domains.

Environmental-responsive or “green” budgeting means using the tools of budgetary policy making to help achieve climate and environmental goals. This includes evaluating environmental and climate impacts of budgetary and fiscal policies and assessing their coherence towards the delivery of national and international commitments, such as the Paris Agreement, the Aichi Targets or the environmentally related Sustainable Development Goals.

Building on international work streams, the Collaborative is an open research platform that brings together environmental, tax, budget and fiscal affairs experts to support peer learning and the exchange of good practices; advance the required analytical and methodological groundwork; and offer targeted assistance for developing a Green Budget Strategy. This includes: proposing, developing and testing pragmatic and transparent tools, such as a Green Budget Statement, to provide an overview of how the annual budget supports achieving environmental goals; guidelines for environmental cost-benefit assessments to support green budgeting; and country scans to investigate the tax revenue effects of environmentally oriented tax policy.

Further information: www.oecd.org/environment/green-budgeting/

4.3. Align incentives and mandates of all public institutions with climate objectives

In addition to budgetary processes, governments have significant influence over broader sectors of the economy through public procurement decisions, SOEs, development co-operation, and export credits.² By aligning the core mandates and decision-making processes of public institutions with climate objectives, governments can further align their financial flows with a low-emission, resilient future. Sovereign wealth funds and public pension schemes, which typically have significant investments, can build climate objectives into their investment strategies.

Make public procurement a force for change

The significant level of public purchase of goods and services – amounting to 12% of GDP on average among OECD countries (OECD, 2017^[21]) – can play a major role in driving low-emission, resilient infrastructure investments. Traditionally, procurement decisions are based on the lowest-cost bidder. Considering life-cycle costing, including life-cycle carbon emissions and other externalities, could help shift procurement decisions towards low-emission options. Building resilience criteria into infrastructure investments is another important way that governments can avoid climate risks (Vallejo and Mullan, 2017^[22]).

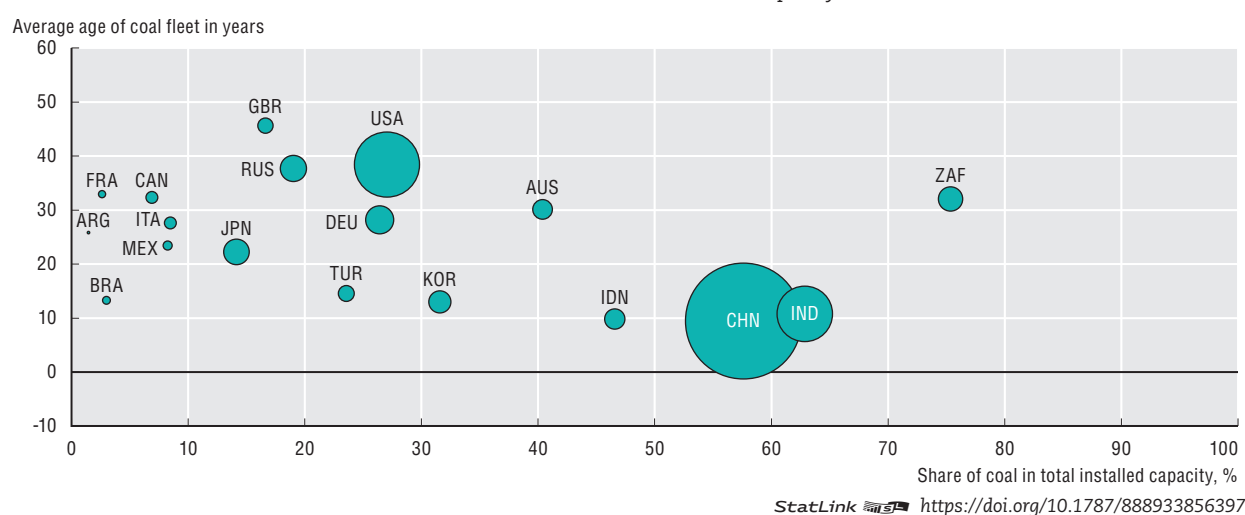
Adopting new methodologies that take into account externalities could allow for objective evaluation criteria alongside cost (such as carbon emissions). The Netherlands have extensively used the Most Economically Advantageous Tender (MEAT) methodology, which monetises CO₂ performance and the environmental impact of materials (OECD, 2017^[23]). Procurement officials and staff need to be sufficiently resourced and trained in order to make public procurement decisions in the interest of a cohesive low-emission transition.

Reorient state-owned enterprises towards low-emission, resilient investments

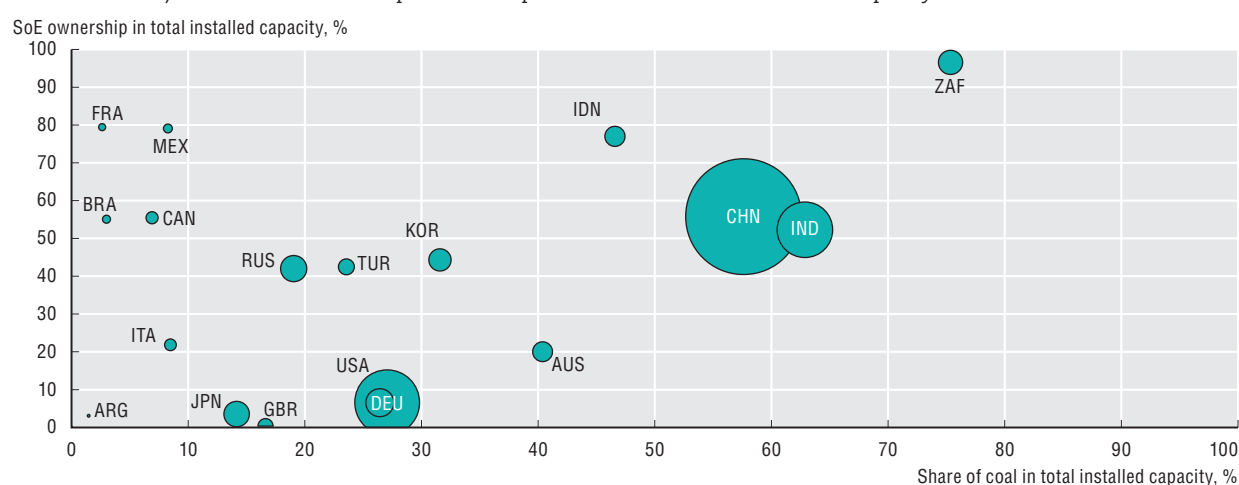
In many countries, SOEs occupy a central role in the electricity generation sector, accounting for 61% of total global electricity capacity installed in 2016 and approximately 52% of capacity planned or under construction (Prag, Röttgers and Scherrer, 2018^[24]). They serve different purposes, such as controlling strategically-sensitive energy supply chains, generating state revenues and securing jobs. As a result of their important presence in these sectors, SOEs are also more exposed to climate change and transition risks. Governments in countries with a high share of SOEs and coal will therefore bear the largest cost associated with the transition if they do not take concrete steps to pivot away from fossil fuels (see Figure 4.2).

Figure 4.2. **Some countries are particularly at risk of stranding coal power plants**

a) Exposure to stranded assets in G20 countries: average age of coal fleet and share of coal in total installed capacity



b) Share of SoE ownership and the importance of coal in total installed capacity in G20 countries



Note: The size of the bubble represents the size of the coal generation capacity stock. The SOE ownership is an estimate based on available SOE ownership data for electricity companies.

Source: Mirabile, M. and J. Calder (2018^[25]), "Clean Power for a Cool Planet" (forthcoming), OECD Environment Working Papers, OECD Publishing, Paris, <https://doi.org/10.1787/19970900>

StatLink <https://doi.org/10.1787/888933856416>

Encouragingly, between 2000 and 2014, SOEs in OECD and G20 countries increased the share of renewables in their electricity capacity portfolios from 9% to 23%, leading investments in newly installed renewables capacity (Prag, Röttgers and Scherrer, 2018^[24]). This demonstrates that jurisdictions with SOEs in the power market can directly influence the energy mix by investing more in renewable power and less in fossil fuel technologies. Norway's national energy company, formerly known as Statoil, has been rebranded as Equinor in a move towards a more sustainable image. They have committed to investing 15-20% of capital spending by 2030 in renewables, up from about 5% in 2017 (Dagenborg and Adomaitis, 2018^[26]).

Mainstreaming climate concerns in SOEs' strategies is an opportunity to influence investment decisions towards low-carbon infrastructure. Decarbonisation efforts could be explicitly and transparently included as public policy objectives in mandates of the SOEs. In addition, SOEs may have access to preferential financing as well as explicit and implicit state guarantees, which translate into lower costs of capital and in turn constitute a substantial competitive advantage in the renewable energy sector, which is dominated by high capital costs (Prag, Röttgers and Scherrer, 2018^[24]).

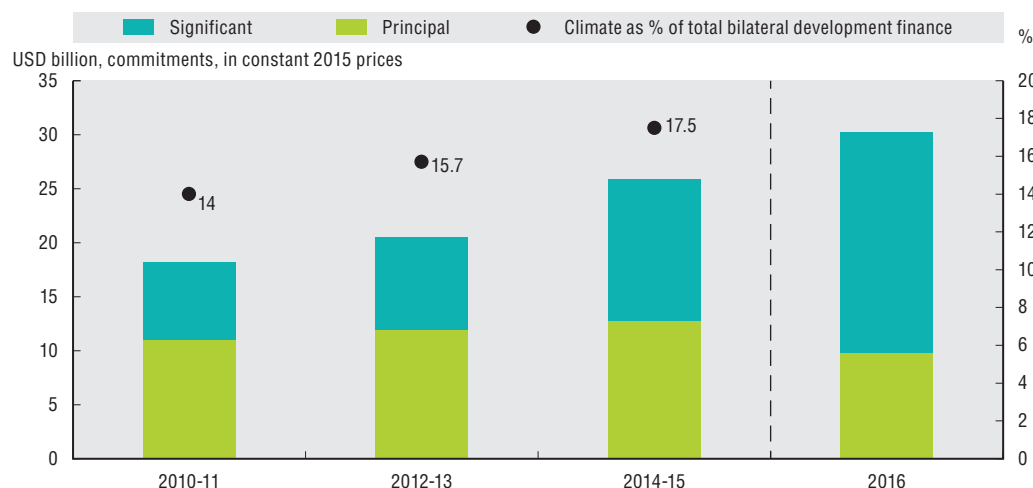
Mainstream climate into development co-operation

Development co-operation plays an important role in supporting action on climate and other environmental issues in developing countries (see Chapter 6). While official development assistance (ODA) makes up only a small share of financing for development when compared with foreign direct investment or government budgets, climate-related ODA is still an important source of support for climate action in developing countries. This includes support to governments and civil society for strengthening the enabling environment – policies, programmes and institutions – for climate-related investments; building the capacity of public and private stakeholders; and mobilising resources for climate-compatible infrastructure. While many middle-income countries will lead the implementation of Agenda 2030 and the Paris Agreement with relatively little external assistance, many others, notably the most vulnerable countries, will require assistance and financial support to make meaningful progress.

For development co-operation to support a transformative shift in countries' development pathways, bilateral portfolios overall need to be aligned with climate goals. The volume of climate-related development finance as a share of overall development finance has been increasing year on year, making up 17.5%, on average, in 2014-15 (see Figure 4.3). However, this suggests that the bulk of bilateral portfolios – over 80% – did not explicitly consider climate change, highlighting an urgent need to better mainstream climate and other environmental objectives across development co-operation, particularly in key natural resources and infrastructure sectors.

It is also important that climate-related support goes beyond business as usual to encourage innovative, targeted solutions that can help countries move away from traditional, emissions-intensive development pathways. Such solutions can include approaches to rapidly scale up commercial investments (Shine and Gampillo, 2016^[27]). Currently, bilateral development co-operation providers' approaches to mobilising commercial investment are relatively limited. For example, much of the emphasis on blended finance³ has been on mobilising different forms of finance from development providers, rather than on attracting commercial investors (OECD, 2018^[28]). In addition, more focus is needed on what climate-related development support is used for, rather than on its size. The evidence for what effective climate-related ODA and other official finance looks like remains limited.

Figure 4.3. The share of bilateral climate-related development finance is increasing
Two-year averages of commitments in USD billion and shares of total bilateral development finance



Note: This is based on data reported by OECD DAC members based on the 'Rio Markers' approach, describing policy objectives of the 1992 Rio Conventions on climate change, biodiversity and desertification. Activities marked 'principal' would not have been funded but for that policy objective; activities marked 'significant' have other prime objectives but have been formulated or adjusted to help meet the policy objective.

Source: OECD, *Climate-Related Development Finance 2016*, OECD Publishing, Paris, <https://www.oecd.org/dac/financing-sustainable-development/development-finance-topics/Climate-related-development-finance-in-2016.pdf>

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Use export credits or investment promotion agencies to influence sustainable infrastructure

Through export credits, countries can influence the type of infrastructure financed outside their borders. For instance, Gutman et al. (2015_[29]) estimate that 20% of external finance for infrastructure projects in sub-Saharan Africa is provided by the People's Republic of China (hereafter 'China') through its institutional bank, EximBank. Historically, the majority of export credits provided by countries that report to the OECD went towards more emissions-intensive sources of power (see Figure 4.4). However, recent years have witnessed an increase in volume of official export credit for renewables. This is being supported by the new rules adopted on export credits for coal-fired electricity generation projects in the run up to COP 21⁴ (see Box 4.3).

Box 4.3. Shifting export credits away from coal-fired electricity generation projects

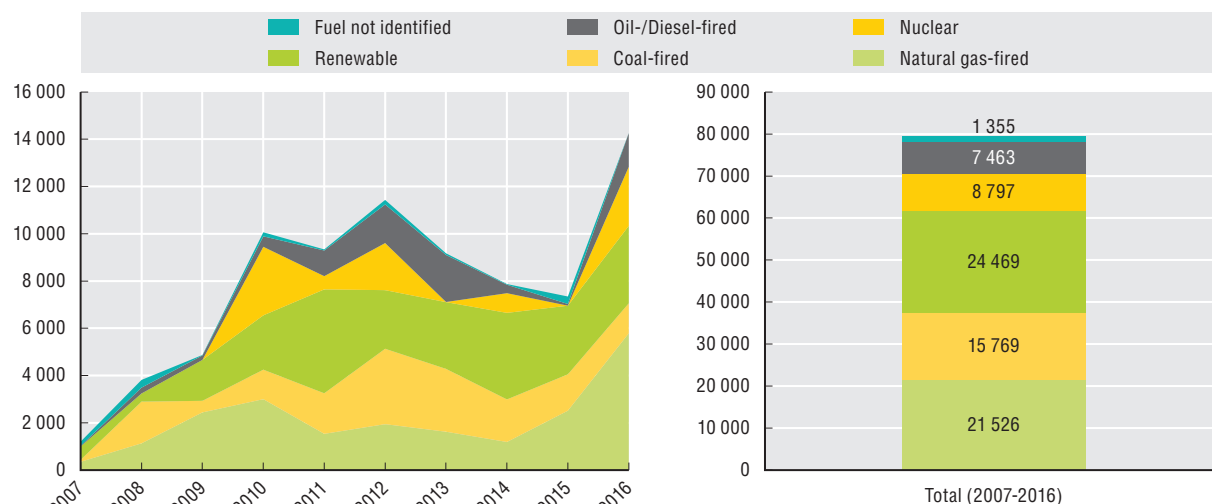
To create a level playing field and avoid potential trade distortions, participants to the OECD Arrangement on Officially Supported Export Credits agree to rules on terms and conditions, as well as on the provision of tied aid. Despite the non-binding character of the arrangement, it has been recognised for enhancing transparency and promoting self-regulation in the sector.

In the run-up to COP 21, participants to the arrangement agreed on "The Sector Understanding on Export Credits for Coal-fired Electricity Generation Project", which limits official export credits for the least effective coal-fired plants and encourages exporters and buyers of coal-fired power plants to move away from low-efficiency towards higher-efficiency technologies.

Source: Drysdale, D. (2014_[31]), *Why the OECD Arrangement Works (even though it is only soft power)*, *Global Policy*; Levit, J. K. (2004_[32]), *The Dynamics of International Trade Finance Regulation: The Arrangement on Officially Supported Export Credit*, *Harvard International Law Journal*, 45.

Figure 4.4. Export credits still support fossil fuels for electricity generation

Countries reporting to the OECD, credit value, USD million



Note: The underlying data set has been drawn from OECD members' individual transaction reporting which covers all official export credits with a repayment term of two years or greater. The data presented are limited to transactions that have been supported according to the terms and conditions of the Arrangement on Officially Supported Export Credits; accordingly, it does not necessarily provide comprehensive figures on the volume of official support provided by members' export credit agencies during the period. Renewables include hydro, solar, wind, geothermal and biomass.

Source: OECD (2017_[30]), "Statistics on Arrangement Official Export Credit Support for Electric Power Generation Projects (2007-2016)", www.oecd.org/tad/xc Cred/business-activities.htm.

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Public investment can help steer climate action

Governments can be powerful institutional investors, wielding tremendous influence over financial flows through their public investments – sovereign wealth funds (SWFs) and public pension funds in particular. SWFs, for example, are projected to reach over USD 15 trillion by 2020 (One Planet Summit, 2018_[33]). Significant fund values and long-term investment horizons make them uniquely positioned to accelerate climate outcomes. Given the significant scale of these funds, building climate objectives into investment decisions is a central way that governments can align financial flows with a low-emission vision of the future.

Countries are stepping up. At the 2017 One Planet Summit, for example, the governments of six large SWFs (France, Kuwait, New Zealand, Norway, Qatar, Saudi Arabia and the United Arab Emirates) joined together to create the One Planet Sovereign Wealth Fund working group. Germany has created a SWF to address the future costs of safely disposing of nuclear waste from energy production; however, the specific details of the investment strategy have yet to be communicated (GeoEconomica, 2017_[34]).

Japan's Government Pension Investment Fund (GPIF), the world's largest pension fund valued at USD 1 trillion, has begun to integrate environmental, social and governance (ESG) factors in their investment strategies (GPIF, 2018_[35]). Norway's SWF – the largest in the world, valued at over USD 1 trillion and with investments accounting for 1.4% of stocks worldwide – has taken steps to divest coal assets, and has an ambitious proposal to remove oil and gas stocks entirely from the Fund's benchmark (NBIM_[36]; Ang and Copeland, 2018_[37]). The third-largest public pension fund in the United States, the New York State Common Retirement Fund, announced intentions to divest from fossil fuel investments over the next five years.

Diversifying investments and directing them towards low-emission, resilient infrastructure projects can also help shield public portfolios from a global shift away from fossil fuels that will need to happen in the coming decades. Governments can continue to shift public investments away from fossil fuels by building ESG factors and climate objectives into their investment strategies.

4.4. Anticipate and address the social consequences of the low-emission transition

Considering the impact of climate policies on poor and vulnerable populations will be key for governments in meeting their social objectives and reducing undesirable and unintended distributional impacts. Further, governments must carefully consider the issue of intergenerational equity; the current cost of addressing the climate challenge may seem significant, but is small in comparison to the financial and societal costs for future generations if left unaddressed. Governments should plan for future generations by leaving a sustainable fiscal and economic legacy. Governments would benefit from developing strategies for how to include those worst affected by the transition to a low-emission economy.

Box 4.4. Lessons from industrial restructuring experiences

Several regions have demonstrated that a planned transition to a low-emission economy can be successful:

- *New labour policies in response to industrial restructuring in China.* The rapid growth of the Chinese economy has been accompanied by several rounds of large-scale industrial restructuring. In addition, the current overcapacity issues in numerous heavy industries underline an important role for transition management policies in the near future. The policy package initially introduced, which included several instruments such as the establishment of re-employment service centres or financial support measures, have gradually evolved over time.
- *Creating skills for greening existing industries, Flanders (Belgium).* The Flemish chemical and construction sector federation has set up a wide range of activities to address the sustainable skills shortage. These include increased collaboration with universities, “improved branding for the sector”, websites to provide information on career perspectives, and collaboration with universities for developing curricula.
- *A “modern transition” strategy: the case of Alberta (Canada).* The Government of Alberta has mandated the phase-out of coal generation by 2029, in line with Alberta’s Climate Leadership Plan. On November 2017, it released 35 recommendations to promote a just transition from coal mining, and announced a CAD 40 million transition fund for workers and communities.
- *Overcapacity and labour policies in the fishing industry (Peru).* Substantial overinvestment in vessels, coupled with changes in ocean currents due to climatic events like El Niño, have created significant pressure on the Peruvian fish stock. A reform was introduced in 2017 to improve fisheries management, and supported financial and training support for workers transitioning to other sectors, entrepreneurial training or early retirement. The programme, which was supported by a loan from the World Bank, has been considered successful in decreasing overcapacity and mitigating the associated social impacts.
- *Decline of UK coal mining industry (United Kingdom).* The UK economy once relied overwhelmingly on coal power. Production declined from 130 Mt/year in 1980 to 4 Mt/year in 2015; employment dropped from 237 000 people in 1980 to 1 000 in 2014. A carbon tax in 2016 triggered the most rapid shift in electricity production, from coal to gas. While some new jobs have been created in affected regions, many have been low-paid. Redundancy payments and employment and training advice helped to bridge the gap in employment for affected workers, but regions remain affected.

Source: Enrico Botta (2018^[40]), A Review of “Transition Management” Strategies: Lessons for Advancing the Green Low-carbon Transition, *Green Growth and Sustainable Development Forum 2018 Issue Notes*; Fothergill, S. (2017^[41]), *Coal Transition in the United Kingdom*, IDDRI and Climate Strategies.

Governments can introduce structural reforms that help firms and workers adjust to market conditions. For example, housing policies could help people move more easily from a low-employment region to a higher-employment region (for example, by improving access to low-cost housing, or decreasing transaction costs). Fiscal policies that favour low-emission innovation and small businesses could result in greater employment opportunities while also benefitting the climate. Revenues from carbon pricing can be used to invest in education, health and clean technology as well as reducing taxes for poorer households (see Section 4.2). Revenues can also be dedicated to improving low-income households' energy affordability (OECD, 2018^[38]).

Labour market policies could maintain high levels of employment and a fair distribution of the transitional cost. For example, policies to build active labour markets could help the unemployed find jobs, while skill development systems could smooth workers' reintegration into employment. Demand-side policies can foster a competitive green sector through strong product market competition and moderate employment protection. Income support such as unemployment insurance and work benefits can also ensure a fairer transition for workers (Chateau, Bibas and Lanzi, 2018^[39]). Box 4.4 presents some examples from around the world.

Notes

1. Carbon leakage refers to the situation that may occur if, for reasons of costs related to climate policies, businesses were to transfer production to other countries with laxer emission constraints. This could lead to an increase in their total emissions. The risk of carbon leakage may be higher in certain energy-intensive industries.
2. Export credits are government financial support, direct financing, guarantees, insurance or interest rate support provided to foreign buyers to assist in the financing of the purchase of goods from national exporters. Since export credits are commercially motivated and linked to a country's trade strategy, data on export credits are usually not as readily available as data on development finance.
3. Blended finance is the strategic use of development finance to mobilise additional finance for sustainable development in developing countries.
4. The 2015 United Nations Climate Change Conference, COP 21 or CMP 11 was held in Paris, France, from 30 November to 12 December 2015.

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