4 Governing Green: Gearing up government to deliver on climate and other environmental challenges

Successfully addressing climate change and other environmental goals is a challenge for democratic governments – they need to show that they are fit to handle this long-term, complex and systemic challenge, manage difficult trade-offs and achieve wider well-being outcomes. This chapter looks at the public governance changes needed to effectively implement urgent green policies and promote other social and economic priorities. It covers several key areas, including steering and building consensus and trust for delivering green, using the right tools for climate and environmental action, and leading by example through greening the public sector.

4.1. Introduction

Momentum – and urgency – are building for governments to address climate change and other environmental pressures. The latest Intergovernmental Panel on Climate Change (IPCC) Report calls climate change "widespread, rapid, and intensifying" (IPCC, 2021[1]). Evidence also points to increasing and unprecedented negative trends in nature, including biodiversity and ecosystems (IPBES, 2019[2]). The United Nations Climate Change Conference, COP26, held in Glasgow in November 2021, marked a significant milestone in global efforts to advance towards a net zero carbon future. The COVID-19 pandemic along with the unprovoked Russian attacks on Ukraine have exposed many vulnerabilities shining a stark spotlight on the need for countries to be prepared to face substantial risks of major shocks. The 2022 United Nations Climate Change Conference (COP27) and the United Nations Biodiversity Conference (COP 15) will convene governments to give direction on climate and the environment. Transformative action is needed to address climate tipping points and other interrelated environmental pressures, including accelerated biodiversity loss, rising air and water pollution, and waste generation.

Successfully addressing climate change and other environmental goals is a challenge for democratic governments – they need to show that they are fit to handle long-term, complex, interconnected and systemic challenges, manage difficult trade-offs and achieve wider well-being outcomes. As Figueres and Rivett-Carnac have noted *"(i)f democracy is to survive and thrive into the twenty first century, climate change is the one big test that it cannot fail"* (Figueres and Rivett-Carnac, 2020[3]). The fates of democracy and policy action for climate and the environment are interconnected. At the same time, some people and groups are dissociating themselves from traditional democratic processes, making it more difficult for governments to engage with them on environmental policy choices and individual action.

A key challenge facing democratic governments is how to achieve the deep and broad public governance changes needed to implement urgent green policies and advance other social and economic priorities. The success of these policies will largely depend on trust in public institutions. Indeed, trust levels and effective action on climate and the environment are interdependent. On the one hand, low levels of trust in public institutions may impede government's ability to implement effective environmental policy. On the other hand, there is a risk of a negative feedback loop between a lack of effective action on these issues and trust in public institutions. Climate variability and climate extreme events, biodiversity loss, natural and human-made environmental disasters, and water crises are all potential sources of shocks and stresses. Real or perceived mismanagement in addressing these challenges or a lack of transparency on the policy actions taken could further erode trust in public institutions.

The recent OECD Trust survey provides some hindsight in this regard. On average in the OECD, about half (50.4%) of respondents think that governments should prioritise climate change. Part of the issue may be that people are unwilling to accept the costs; addressing climate change requires both immediate and long-lasting sacrifices in exchange for a crucially important but diffuse long-run payoff. But another likely factor is a government's perceived competence. People may not be confident that public institutions are competent and reliable enough to deliver policies effectively, and for long enough, to generate benefits. Indeed, on average only 35.5% of people are confident that countries will succeed in reducing their country's contribution to climate change by reducing greenhouse gas emissions. In other words, while half of people think that climate change is a serious issue for governments, just over a third believe that countries will actually meet the targets (Box 4.1 and Figure 4.3).

Gearing government for the green transformation is therefore critical and urgent. The magnitude and urgency of addressing environmental challenges require comprehensive efforts on all fronts and from all actors. Indeed, success in tackling climate change and biodiversity loss will demand collective efforts from the public and private sectors, international organisations, civil society groups and individual citizens.

Yet, achieving the changes required for the green transition will necessarily depend on government steering and implementing policies, both at home and on the international stage. There are key tasks that must largely be carried out by governments and the state (Giddens, 2009[4]). Most notably, these are the agreement, design and delivery of policies and investments to respond to environmental threats, but they also include setting expectations and guidance by individuals, private sector and civil society as a whole on how to adapt towards cleaner, greener solutions and outcomes, and building resilience to future shocks. Climate change, biodiversity and other environmental emergencies span borders and can only be managed through international co-operation. However, the responsibility for setting green commitments and implementing them lies with governments that may have diminished interest in and capacity for tackling issues that go beyond their own borders.

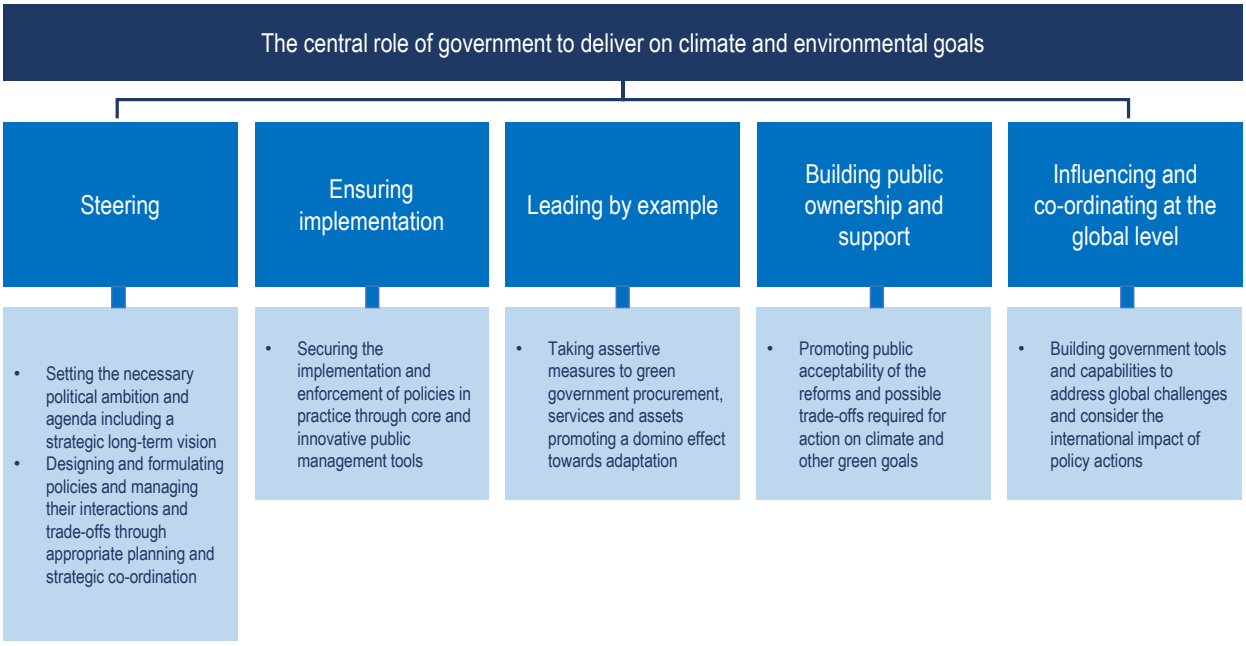
It is therefore crucial to discuss not only the *content* of policies for the green transformation, but also *how* governments design and agree on the optimal policies to fight climate change and address environmental priorities; *how* they ensure that these policies are effectively and efficiently implemented, sustainably financed and delivered; and *how* they garner cross-cutting support and consensus from society. In this context, this chapter:

- Outlines the **essential role of public governance** in addressing climate change and other environmental threats; and
- Highlights the **main challenges governments face** in ensuring that public governance effectively supports green efforts while accounting for spillover effects.

Based on the existing work of the OECD Public Governance Directorate, this chapter sets out some of the key transformations required in public governance to secure the achievement of green goals.

In simple terms, there are **5 key dimensions** where public governance will have a significant bearing on the global transformation (Figure 4.1).

Figure 4.1. The central role of government in achieving climate and environmental goals



4.1.1. Identifying the main challenges for public governance

In carrying out these key roles, governments face a number of challenges and impediments, both in terms of the **context** and of their **capacity to act**.

Countries need to forge consensus on urgent transformations against a backdrop of declining public trust and increasing discontent with governments and democratic institutions**.** The policies that are needed require not only technically sound governments, but also their ability to make difficult choices. These choices will help secure our collective future, but necessarily involve both winners and losers. The costs and impacts of climate change as well as measures to address it, will be unevenly distributed across society, across generations and across countries. So, governments must not only design appropriate climate and other environmental policies, but also build a strong consensus for action both across society and within public institutions dealing with other competing policy objectives. This is crucial to ensure that governments have a robust mandate to overcome collective environmental problems, make choices on how to distribute the costs of the response, and credibly bind themselves to undertake long-term policies that will outlast any single administration.

The ability of a government to address environmental threats is strongly linked to democratic settings. First, the inherent short-termism of the electoral cycle discourages a focus on long-term and transgenerational issues such as climate change and biodiversity loss (Linz, 1998[5]). At the same time, long-term environmental pressures play into some of the key challenges currently facing democracies. For example, addressing climate change is a science-driven issue, yet democratic governments struggle to promote evidence-based policies given the proliferation of mis- and dis-information, low levels of trust in traditional sources of information (including governments and mainstream media), and the limited access to, availability and reuse of environmental data. Climate action calls for far-reaching policy measures, which governments may have trouble adopting and implementing while facing trust deficits (OECD, 2021[6]). Citizens stand ready to voice discontent against policies that require change and that fail to meet transparency, fairness and representability requirements.

Within this complex political economy of reform, there are also several classic public governance shortcomings that dramatically affect the capacity of governments to effectively address climate and environmental issues. These include the difficulties of managing fast-shifting policy priorities; ensuring coherence when designing policies that cut across different areas and levels of government and managing the related synergies and trade-offs; and successfully applying both core and innovative, public management tools (such as strategic planning, budgeting, regulation and evaluation). These difficulties can be perceived in countries' post-COVID-19-recovery plans where spending on environmentally positive measures represented only 21% of total recovery spending (OECD, 2021[7]).

Moreover, governments still struggle to build adequate national and international structures and competences to tackle transboundary challenges such as environmental ones. This may lead citizens to think that their governments lack the capacity and tools to fully address the issues that are of critical and growing importance to their lives.

4.2. Outline of this chapter

The OECD has so far produced work on an array of public governance issues that are critical to achieving green goals, including on public budgeting, public procurement, infrastructure governance, policy coherence, and multi-level governance, to name a few. Yet, a holistic public governance approach, which pieces together how the machinery of government can be geared towards environmental and climate action, is still missing. This chapter does not look at tax governance, which is a core element of tax policy and a core element of mitigation strategies.

Bringing together existing work of the OECD Public Governance Committee, Regulatory Policy Committee and Committee of Senior Budget Officials in a range of relevant areas, this chapter seeks to create a better understanding of the public governance transformations required to successfully respond to environmental pressures, in particular that of climate challenge. **It does so through 3 key areas for transformation**:

1. Steering and building consensus and trust for delivering green in the next decade;
2. Using the right tools for climate and environmental action; and
3. Leading by example – A greener and more resilient public sector

This chapter also contributes to the OECD's Horizontal Project on Climate and Economic Resilience, which provides an updated, whole-of-OECD perspective on the main dimensions and dangers of climate change, with a particular focus on economic resilience and the policies needed to improve it through mitigating and adapting to climate change.

Figure 4.2. Governing Green: Some key indicators

Sources: Composite Indicator on Green Budgeting in the OECD (2022, forthcoming), OECD and EC (2020), Joint Survey on Emerging Green Budgeting Practices; OECD (2018), OECD Budget Practices and Procedures Survey; OECD Indicators of Regulatory Policy and Governance surveys 2014, 2017 and 2021; OECD (2020), Survey on the Governance of Infrastructure; OECD (2020), Survey on Leveraging Responsible Business Conduct through Public Procurement; OECD (2018), Survey on the Implementation of the 2015 OECD Recommendations on Public Procurement.

4.3. Steering and building consensus and trust for delivering green in the next decade

In OECD democracies, governments will be in a better position to steer societies towards optimal environmental results if they are able to change the way they make policies and build trust and consensus for action. To achieve this change, it will be crucial to strengthen integrity to avoid biased policy decisions, improve stakeholder engagement in decision making, reinforce accountability and use all available tools to communicate and influence citizens' behaviour. Delivering on green will also require governments to build competencies and means to 'go global' to address issues that directly affect citizens but are of a global nature, this issue is addressed in Pillar 3 of the OECD Reinforcing Democracy Initiative (see Chapter 3).

4.3.1. The nexus of climate action and trust in institutions

When considering the issue of climate change alone, there is broad consensus in many OECD countries that it is a major problem and requires a government response. 93% of Europeans believe climate change is a serious problem and nearly 20% consider it the most serious problem facing the world.[1] 75% of Europeans believe that their government is not doing enough to tackle climate change (European Union, 2021[8]). Yet, consensus on the need to tackle the climate crisis is not enough to ensure effective policy responses. Success will largely hinge on trust in public institutions, which play a critical role in promoting collective action. Evidence from many OECD countries shows that trust in government is a significant factor in citizens' willingness to support climate policies (Hammar and Jagers, 2006[9]) (Harring and Jagers, 2013[10]) (Rhodes, Axsen and Jaccard, 2017[11]). Individuals with low trust in the effectiveness or fairness of public institutions have few incentives to look to them for collective solutions to environmental problems. In addition, responsive, transparent and fair institutions help strengthen social consensus. Furthermore, engaging citizens facilitates the creation of broad coalitions in favour of climate change policies that go beyond electoral cycles.

In general, trust in public institutions can be increased by improving the public perception of government competence and values. In particular, the following two main aspects of trust in public institutions affect public support for climate change policies (OECD, 2022[12]):

- **Trust in government competence (*reliability*) to build sustainable long-term policies.** Climate policies may impose costs today in return for potential benefits for future generations. Survey evidence shows that support for future-oriented policies on climate is affected by people's trust in the effectiveness of public institutions. While most people believe that mitigating climate change will make future people's lives better, they may not support these policies if they have little confidence that public policies will mitigate climate change (Fairbrother et al., 2021[13]). Citizens must trust that public institutions are competent to effectively implement policies for long enough to generate benefits, or they will be unwilling to accept the costs.
- **Trust in government values (*fairness*) to ensure the acceptability of environmental policies.** Climate policy requires complicated and sometimes expensive trade-offs. The success of policies to address environmental pressures will depend on the trust people have in the capacity of governments to plan and deliver policies that distribute costs fairly, are carried out with high integrity standards and are open to public scrutiny. Convincingly communicating on the costs and benefits involved will be critical to public acceptance (Brezzi et al., 2021[14]).

Measuring people's trust in climate policies could help countries maximise public support and acceptability for green reforms on the basis of evidence. Understanding how the determinants of trust in public institutions affect the support for different climate policy alternatives could help inform the type of public governance actions required to enhance trust in different options. The OECD is taking the lead internationally on measuring trust in public institutions and its determinants through its Survey on Drivers of Trust in Public Institutions (Box 4.1).

Governments should build a positive feedback loop through governance mechanisms to demonstrate the reliability and fairness of climate policies. When it comes to climate policies, individuals and businesses need to trust that public institutions will continue pursuing climate change mitigation in the future (*reliability*) and that they are not requiring efforts from one part of the population while allowing others to avoid their responsibilities (*fairness*). The incorporation of long-term sustainability considerations is also of paramount importance for trust in policies.

Trust data can help governments improve policy making and climate change mitigation plans. Countries have started integrating citizens' experiences, expectations and evaluations of the public sector into decision making, albeit not yet systematically. For example, Australia used the results of the Citizens Experience Survey, showing young people's dissatisfaction with public services and concerns with environmental policy, to drive its National Youth Policy Framework. Moreover, using data to report back to citizens in a transparent, participative and regular way can enhance public governance accountability, help clarify trade-offs, and build public ownership of policy measures. On the other hand, monitoring the acceptability of environmental policies and anticipating citizen engagement can also help guide governments in planning and delivering green reforms while maintaining trust in institutions (see behavioural insights example from Canada in Box 4.15).

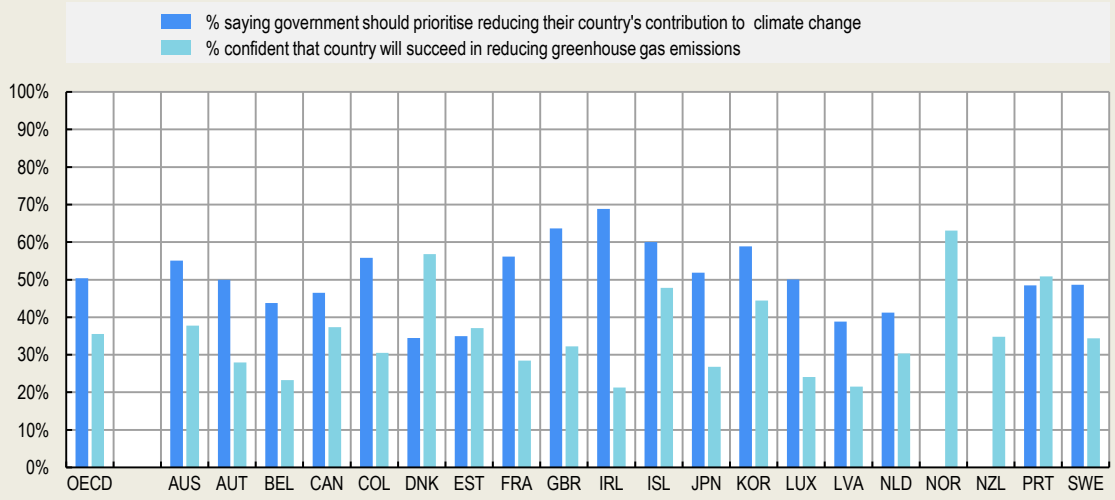
Box 4.1. Findings from the OECD Survey on Drivers of Trust in Public Institutions

The OECD Survey on Drivers of Trust in Public Institutions (Trust Survey) is a cross-country effort to collect data on the determinants of public trust. The Trust Survey incorporates questions on the reliability of government, including whether people consider their government prepared to deal with systemic shocks such as natural disasters or the spread of contagious diseases.

On average in the OECD, about half (50.4%) of respondents think that governments should prioritise climate change. Part of the issue may be that people are unwilling to accept the costs; addressing climate change requires both immediate and long-lasting sacrifices in exchange for a crucially important but diffuse long-run payoff.

But another likely factor is a government's perceived competence. People may not be confident that public institutions are competent and reliable enough to deliver policies effectively, and for long enough, to generate benefits. Indeed, on average only 35.5% of people are confident that countries will succeed in reducing their country's contribution to climate change by reducing greenhouse gas emissions. In other words, while half of people think that climate change is a serious issue for governments, just over a third believe that countries will actually meet the targets (Figure 4.3).

Figure 4.3. Half of OECD Trust Survey respondents think their government should prioritise actions to reduce climate change, but only about one-third have confidence in their country's ability to reduce greenhouse gas emissions

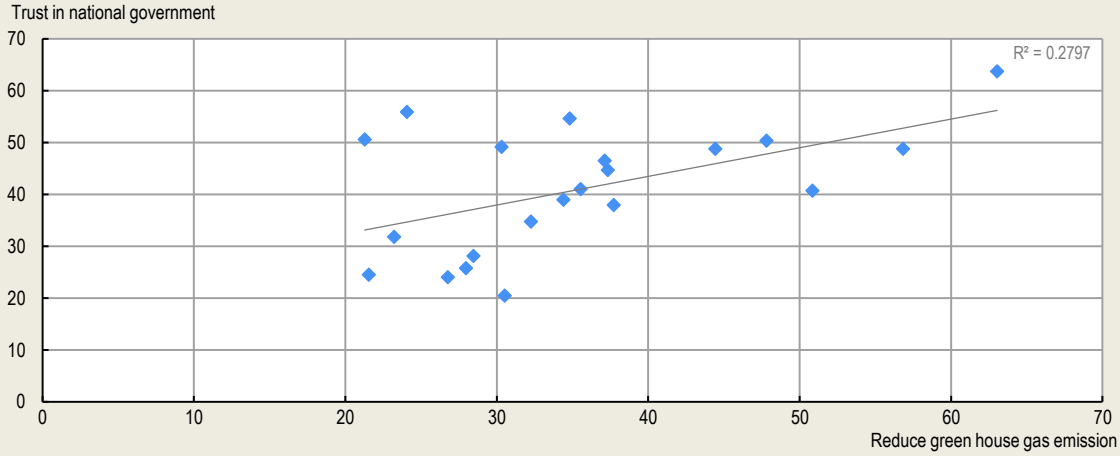


Note: Figure presents the average share of respondents to the questions "On reducing your country contribution to climate change, do you think the government should be prioritising a lot more, more, about the same, less, or a lot less?". The "more" share in the figure is the aggregation of the responses choices "a lot more" and "more". Respondents were asked "How confident are you that your country will succeed in reducing greenhouse gas emissions in the next 10 years?" The "confident" share is the aggregation of response choices "somewhat confident" and "very confident". "OECD" presents the unweighted average of responses across countries. Finland, Mexico, New Zealand and Norway are excluded (or partially excluded) from this figure as comparable data were not available. For more detailed information on the survey questionnaire and processes in specific countries, please find the survey method document at http://oe.cd/trust.
Source: OECD (2022[15]), Building Trust to Reinforce Democracy: Main Findings from the 2021 OECD Survey on Drivers of Trust in Public Institutions, *Building Trust in Public Institutions*, OECD Publishing, Paris, https://doi.org/10.1787/b407f99c-en

Cross-nationally, high levels of confidence in a government's ability to commit to addressing climate change are positively correlated with trust in government. Analysis from the OECD Trust Survey finds that people's confidence that the country will reduce greenhouse gas emissions has a statistically significant, positive relationship with trust in national government and, to a less extent, local government and civil service. In other words, investing in public governance to deliver more effective policies to fight climate change may pay off in securing more credibility and trust in government. This relationship holds within countries, too; those who are confident that their government can credibly commit to reducing greenhouse gas emissions are more likely to trust their government (Figure 4.4).

Figure 4.4. Countries that are seen as more competent in the fight against climate change also benefit from higher levels of trust in government

Share of respondents that are confident that their country will succeed in reducing greenhouse gas emissions over the next 10 years (x-axis) and the share who trust their national government (y-axis), 2021



Note: This scatterplot presents the share of "trust" responses to the question "On a scale of 0 to 10, where 0 is not at all and 10 is completely, how much do you trust each of the following? The national government", equal to the values of responses 6-10 on the response scale, on the y-axis. The x-axis presents the share of "confident" responses to the question "How confident are you that [country] will succeed in reducing greenhouse gas emissions in the next 10 years?". The "confident" response is the aggregation of responses "somewhat confident" and "completely confident". "OECD" presents the unweighted average of responses across countries. Finland is excluded as the results on confidence were not available, and Mexico is excluded due to lack of data on both questions. New Zealand here shows trust in civil service as respondents were not asked about trust in the national government (note that trust in civil service on average tends to be higher than trust in national government). For more detailed information please find the survey method document at http://oe.cd/trust.
Source: OECD (2022[15]), Building Trust to Reinforce Democracy: Main Findings from the 2021 OECD Survey on Drivers of Trust in Public Institutions, *Building Trust in Public Institutions*, OECD Publishing, Paris, https://doi.org/10.1787/b407f99c-en

Some challenges require more than a reliable and responsive national government – they require the involvement of other actors and partners. On average across countries, people are most likely to express interest in global co-operation to address issues like climate change, terrorism, and pandemic preparation. Yet there is still relatively low public support for global co-operation to target these issues; around half of respondents call on governments to work together to address climate change. When asked about how to co-operate globally, the most popular response – "joining forces with other governments internationally" – was selected by 43.4% of respondents, on average cross-nationally. The next three most commonly selected answer choices – engaging citizens on global issues, strengthening co-ordination across government offices, and strengthening the country's role in international institutions – were selected by fewer than one in three respondents.

As the risks associated with climate change become ever more urgent – and as costs increase for diffuse, long-term payoffs – governments must do better in communicating to the public the benefits of co-operation to tackle these challenges. These kinds of issues can only be resolved through global co-operation.

Source: OECD (2022[15]), Building Trust to Reinforce Democracy: Main Findings from the 2021 OECD Survey on Drivers of Trust in Public Institutions, *Building Trust in Public Institutions*, OECD Publishing, Paris, https://doi.org/10.1787/b407f99c-en

4.3.2. Leadership – setting commitments and the path to meeting them

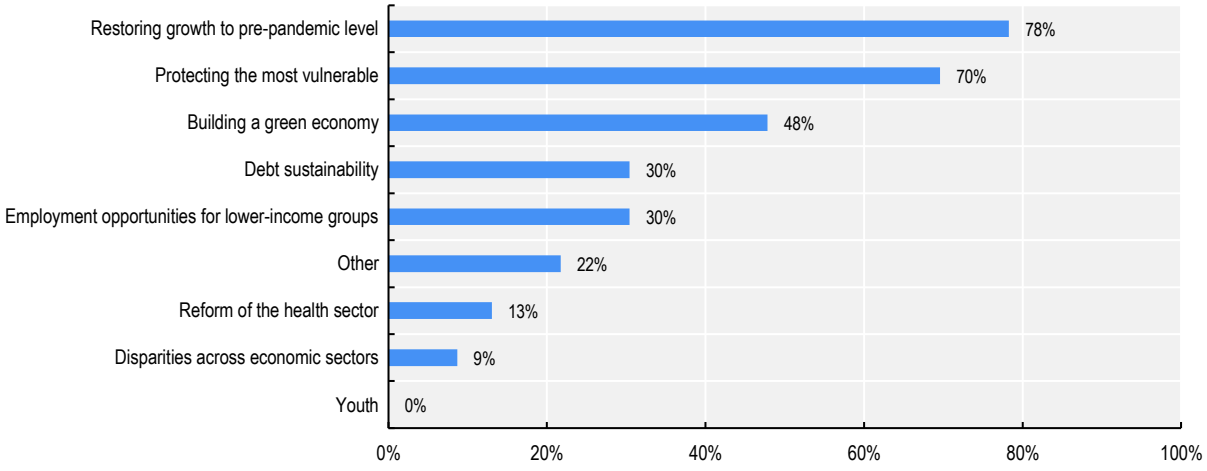
Committed political leadership is vital to building consensus and trust for the success of climate and environmental policies.

Signalling strong political support for green action can be done in various ways. Bold national and international commitments – for example to achieve net zero carbon emissions by a specific date – are perhaps the most evident (Jeudy-Hugo, Lo Re and Falduto, 2021[16]). However, the uncertainty surrounding projections of climate change and its impact, unrelated external shocks, technological changes and societal perspectives and preferences over time all hamper governments' ability to visualise and describe futures on which decisions can be based (OECD, 2021[17]) (Haasnoot et al., 2013[18]) (Butler et al., 2015[19]) In this unique environment, governments sometimes struggle to make climate and the environment a cross-cutting strategic priority that involves the whole of government, especially when resources are limited (IPCC, 2007[20]) (Noble, 2014[21]) (Guillén Bolaños, Manez Costa and Nehren, 2016[22]).

This difficulty is already clear in governments' COVID-19 recovery efforts. While they see the recovery as an opportunity to "build back better", with a focus on long-term climate resilience (Figure 4.5), evidence from the OECD Green Recovery Database (OECD, 2021[23]) highlights that, as of September 2021, "green measures have increased in number and budgetary size, yet still account for a small share of total recovery spending", with USD 667 billion allocated towards environmentally positive measures, which represented only around 21% of recovery spending announced by governments (OECD, 2021[7]).

Figure 4.5. Government priorities in support of COVID-19 recovery efforts

Percentage of governments for which each area is among their top three priorities



Note: Includes data from centres of governments in Belgium, Canada, Chile, Colombia, the Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Iceland, Israel, Italy, Korea, Latvia, Lithuania, Luxembourg, Mexico, Norway, Poland, Portugal, Sweden and Türkiye.
Source: OECD (2021[6]), *Government at a Glance 2021*, OECD Publishing, Paris, https://doi.org/10.1787/1c258f55-en.

Making green policies and climate action a priority therefore not only entails being explicit about the nature and scope of desired goals, but also ensuring they are appropriately funded (Rüdinger et al., 2018[24]) (Jones et al., n.d.[25]) (Andres et al., 2016[26]), both to achieve environmental outcomes and to ensure the credibility of government action and long-term commitment. Achieving green goals will require a massive fiscal effort. The OECD estimates that USD 6.9 trillion a year up to 2030 is required to meet climate objectives (OECD, 2017[27]). The objectives of the Paris Agreement require a radical change to infrastructure, technology and behaviour (OECD/The World Bank/UN Environment, 2018[28]). Spending decisions are therefore central to strong government leadership on these issues and will be central to the

success of climate and environmental commitments going forward. For instance, in New Zealand, climate change is one of only five priorities in the 2021 budget, and ministers are asked to justify their proposals for bills in light of those priorities. Linking priorities to adequate funding requires using all budgeting policy tools (green budgeting, spending reviews, among other) to make progress towards green priorities. This is discussed further under Key Area 2.

Linking major infrastructure decisions and plans to green objectives can demonstrate strong commitment and leadership. The green transformation will depend to a large extent on the ability of governments to promote sustainable infrastructure, especially in the energy and transport sectors. Around 30% of the total greenhouse gas emissions worldwide are produced by the energy sector and 15% by the transport sector (World Resources Institute, 2017[29]). Retrofitting public buildings to make them more energy efficient, smartgrids, and digital infrastructure are examples of government investment decisions that can underpin and enable the broader green transformation (OECD, 2022[30]). Strategic infrastructure planning is not only a tool to achieve green efficiencies (as discussed in Key Area 2), but a decisive element of the transition.

Signalling strong political support for green priorities and climate action can also be achieved through other governance mechanisms, such as:

- placing the climate portfolio at the centre of government (i.e. the White House national climate advisor in the United States or the National Climate change Secretariat in Singapore)
- fostering cross-party adhesion (i.e. the creation of a bi-partisan group of 35 elected representatives for sustainable development in the New-Zealand legislature, or the multi-party consultation of the 2012 General Law on Climate Change in Mexico)
- building the necessary institutional frameworks to engage citizens (in Denmark the Danish Board of Technology was mandated with facilitating the Climate Citizen's assembly; in Spain, public participation is built into climate legislation; and France created the Citizen Convention on Climate as an ad hoc initiative – see Box 4.2).

OECD Member countries have also developed a variety of institutional arrangements to ensure that government decisions are aligned with climate actions. Approaches to steer, formulate and co-ordinate climate change strategy range from highly embedded sectoral approaches to top-down centralised ones (OECD, forthcoming[31]). Furthermore, the legal "bindingness" of climate action can also help enhance the credibility, commitment and continuity of a climate framework over time, ranging from a single policy, to a climate plan, strategy or law (Rüdinger et al., 2018[24]). For instance, the UK's experience with the Climate Change Act of 2008 showed that a comprehensive legislative framework could help advance climate action and steer government policies and programmes (Averchenkova, Fankhauser and Finnegan, 2018[32]). Chile's 2022 Climate Change law provides an additional recent example of climate legislation. In Luxembourg, the Climate Pact – a co-operative agreement through which local governments commit to implement environment- and climate-related measures – has helped improve co-ordination between the central and local governments for action in line with national climate mitigation commitments.[2]

Governance models also need to ensure that policy decisions on climate action enable the leadership of those at most impacted by of climate change, such as indigenous peoples. Integrating the leadership and knowledge of indigenous peoples in green policy making is pivotal to improve legitimacy and sustainability of climate action (Government of Canada, 2021[33]). Governance mechanisms enabling indigenous leadership include: ensuring effective participation in the design and implementation of green programmes, creating collaborative management agreements of protected areas, capacity building and financial support (IUCN, 2019[34]); and guaranteeing effective legal protection of indigenous peoples rights (e.g. free, prior and informed consent; land and cultural heritage) and equal access to justice (including co-ordination between indigenous and non-indigenous justice).

4.3.3. Stakeholder participation for green governance

Given the scale of the transformations required to act on climate change and other environmental issues, governments should promote dialogue with stakeholders and citizen participation in the decision-making process. Such engagement is crucial to building public trust on climate policies. Consulting and partnering with different stakeholders helps ensure that a wide range of expertise and views are channelled into policy measures. A protected civic space that allows a variety of stakeholders to understand and engage on complex policy issues, to peacefully assemble and associate, to express their views in safety and security, and to hold governments to account for their actions, is also essential for the climate transition. Pillar 2 of the OECD Reinforcing Democracy Initiative centres on the main challenges for representation and participation and how they can be addressed to regain citizens trust and reinforce democracy (see Chapter 2).

Working strategically with civil society during the policy cycle will help to fine-tune actions in line with local realities, improve risk analysis, and design and deliver effective and sustainable programmes and policies. Successfully addressing environmental pressures will require collective action from a variety of stakeholders, including public and private sector actors, international organisations, civil society organisations (CSOs) and individuals. Such collaboration can also help to instil trust, build consensus and increase the legitimacy of government decision making on difficult climate transition measures. CSOs are vital for information exchange between citizens and the state because of their ability to reach out to minorities and marginalised groups and to raise awareness in local communities and society as a whole. They can play a central role in giving citizens the opportunity to influence and take part in decisions that affect their lives and futures. To enable them to do so, and help harness local knowledge and identify citizens' needs, governments should take a non-discriminatory stakeholder engagement approach that allows all citizens, especially those directly affected by climate change or related policies – including indigenous populations and those who are most vulnerable – to systematically and transparently engage with government on an equal basis (OECD, 2017[35]). Global CSO networks, such as the Convention on Biological Diversity (CBD) Alliance and the Climate Action Network (CAN), can play an important role in strengthening the capacity of local and national CSOs.

New forms of public participation can give public decision makers the legitimacy to make hard choices and take action. Deliberative processes work well for addressing complex problems that involve long-term consideration of values and weighing trade-offs. They can help policy makers better understand how issues affect certain groups as well as what citizens themselves would propose to address these challenges. These processes (e.g. citizens' assemblies, juries, and panels) bring together groups of citizens that are broadly representative of society to tackle challenging policy issues such as the climate transition (OECD, 2020[36]). They are designed to allow the group to access a wide range of resources, hear from experts and stakeholders, deliberate together, and find common ground to draft collective and informed recommendations for policy issues. In the case of climate, they allow governments at all levels to involve diverse groups of ordinary people more directly in identifying where communities are willing to make trade-offs and hard choices, including how to pay for climate-related transitions. The data shows a notable increase in the number of deliberative processes addressing climate-related issues in the past few years, including the Irish Citizens' Assembly on Climate in 2016-2018, the 2019-2020 *Convention Citoyenne pour le Climat* in France, and the 2021 German Citizens' Assembly on Climate (Box 4.2).

Empowering and engaging with youth to address climate change and including intergenerational considerations in core functions of the government are essential to sustainable long-term policy making. Youth-led mobilisations, including "Fridays for the Future", have been critical in placing climate justice at the top of the political agenda, highlighting that future generations are the primary group concerned by long-term degradation of the environment. Governments across the OECD have started to establish new institutions, structures and processes to involve young people in the process. For instance, a Youth Climate Council was established to advise on how Denmark can most effectively (and cost-effectively) undertake

the transition to a low-carbon economy by 2050 (OECD, 2020[37]). In Ireland, the government set up a Youth Climate Justice Fund, which has made EUR 500 000 available to support youth-led action and innovation on climate justice (Department of Children and Youth Affairs Ireland, 2020[38]).

Last but not least, making key public sector datasets available as open government data can help engage key stakeholders in the re-use of data to design joint actions, understand major trends and build stronger public awareness of the different facets of climate change and its implications.

Box 4.2. Examples of deliberative processes addressing climate-related issues

Citizens' Convention on Climate in France (2019-2020)

The Citizens' Convention on Climate was a deliberative process that brought together 150 citizens representative of the French population, selected via civic lottery, for seven weekends over six months. It was designed to give citizens an opportunity to propose informed policy recommendations for addressing climate change, to define a range of measures that will enable France to reduce its greenhouse gas emissions by at least 40% by 2030 (compared to 1990 levels) in a socially just and equitable way. After extensive deliberation, citizens prepared a list of 149 measures for the French government.

Besaya Citizens' Jury (2021)

The Besaya Citizens' Jury was comprised of a broadly representative group of 35 everyday citizens selected by civic lottery from ten municipalities in the Besaya region in Spain. Citizens met online and in person for six weekends between May and July. They were asked to develop recommendations for the Regional Ministry of Economy on how to make the most of European Green Funds in the Besaya basin to create and / or maintain jobs that respect the criteria of a fair and inclusive ecological transition. Citizens identified three strategic priorities and 26 specific recommendations for action.

The Klima-Biergerrot (Citizens' Assembly on the Climate) in Luxembourg (2022)

Between January and July 2022, the Klima-Biergerrot will bring together a representative sample of 100 people living or working in Luxembourg to discuss the country's current commitments on climate change and develop possible additional measures or proposals. At the end of this process, the outputs will be presented and debated at the Luxembourg Parliament and are then likely to influence the new version of the Integrated National Energy and Climate Plan (NECP).

Source: Besayaeuropa.es. 2021. Besaya delibera en Europa. Available at: https://besayaeuropa.es/; Convention Citoyenne pour le Climat. 2021. Site officiel de la Convention Citoyenne pour le Climat. Available at: https://www.conventioncitoyennepourleclimat.fr/; https://www.klima-biergerrot.lu/en.

4.3.4. Ensuring integrity and transparency in green governance

Better stakeholder engagement also requires stronger integrity policies to prevent undue influence by certain groups, particularly as some environmental and climate change policies would negatively affect interests benefitting from the *status quo*. The public institutions responsible for green governance must be trustworthy and meet integrity and transparency requirements if the policies they design are to be seen as legitimate and acceptable. Failure to address the institutional and governance gaps that enable corruption or undue influence will have particularly dire consequences for communities most affected by climate change and other environmental threats.

Governments should pay particular attention to strengthening integrity standards in public institutions involved in green policies. While the majority of public sector employees have high standards of integrity, evidence shows that climate change policies, in particular those involving climate finance, are vulnerable to integrity violations such as fraud, embezzlement, and bribery. Using a risk-based approach to reviewing and strengthening existing integrity systems in public institutions allows government to identify the public employees involved in the design, implementation or evaluation of climate change policies that may be at higher risk and to take steps to mitigate them. National and international regulatory bodies, such as institutions that govern natural resource management or set pollution standards, for example, should have robust integrity standards including clear and proportionate measures to identify and manage conflicts of interest. In addition, governments should set rules for people from the private sector taking up employment in these bodies (and vice-versa), as well as cooling-off periods tailored to the level of seniority (Williams, 2019[39]; OECD, 2021[40]).

The appointment of climate advisory bodies and environmental expert groups should include transparency and integrity safeguards to ensure the legitimacy of their advice. To meet green and sustainability goals, governments may rely on independent advisory bodies and expert groups, such as the High Council on Climate in France, the Climate Change Advisory Council in Ireland and the Committee on Climate Change in the United Kingdom. Depending on their status and mandate, these bodies may be asked to provide objective analysis to the Parliament and/or the government on climate-related risks, monitor progress on international climate commitments, as well as carry out modelling and scenario planning. The bodies may consist solely of researchers or academics, or also include engineers, economists, think tank directors, public officials, and members of the private sector and civil society organisations with expertise in climate policy (Weaver, Lotjonen and Ollikainen, 2019[41]; Averchenkova, Fankhauser and Finnegan, 2018[32]). Private sector representatives participating in these groups have direct access to policy-making processes without being considered external lobbyists; they may, whether unconsciously or not, favour the interests of their company or industry, increasing the risk of conflicts of interest. As of 2019, only 47% of countries provided information on participants in advisory groups. To allow for public scrutiny, information on a group's structure, mandate, composition and selection criteria must be made available online. Such groups also need rules of procedure, including terms of appointment, standards of conduct, and, most importantly, procedures for preventing and managing conflicts of interest (OECD, 2021[40]).

Green policy design and implementation need to be robust enough to withstand to lobbying and other influence practices that can mislead the public, governments and investors, and hinder effective policy action. This is evident, for instance, in the climate policy where a wide range of economic sectors and industries have stakes in the outcome of debates and negotiations. Engaging with public decision makers is therefore crucial for businesses affected by climate-related regulations. New evidence regularly emerges showing that the abuse of lobbying and other influence practices can block progress on climate change policies. For example, an analysis of a major oil and gas company's internal documents and communications between 1977 and 2014 found that, while its own research had established that climate change was caused by human activity, the company engaged in several practices – notably publishing opinion pieces in newspapers – to raise doubt, influence public opinion and reduce regulatory pressure to curb emissions (Oreskes and Conway, 2010[42]; Supran and Oreskes, 2017[43]). Experience also shows that oil and gas companies have been leading contributors to think tanks and front groups questioning established climate science, and have funded misleading climate-related branding campaigns or social media advertisements (Influence Map, 2019[44]; Graham, Daub and Carroll, 2017[45]).

To ensure greater transparency around green-related issues and lobbying, governments can consider several policy options. First, governments with lobbying registers can strengthen lobbying disclosure requirements to include information on the objective of lobbying activities, its beneficiaries, the targeted decisions and the types of practices used, including the use of social media as a lobbying tool. Second, key public officials involved in climate and environmental decision-making processes (e.g. Minister for the Environment and cabinet members, heads of environmental protection agencies, members of delegations

in climate negotiations) could make their meeting diaries public. Finally, governments could mandate *ex post* disclosure of how legislative or regulatory decisions were made. The information disclosed could include the identity of stakeholders met, public officials involved, the object and outcome of their meetings, as well as an assessment of how the input received were factored into the final decision.

Expanding corporate political spending disclosures would allow greater public scrutiny of corporate involvement in green policy. Companies concentrated in the fossil fuel and energy-intensive sectors (energy, transport) have faced increasing criticism from investors, shareholders and consumers for using climate commitments or sustainability policies to display a public image of climate responsibility while lobbying to delay or block binding climate policies or donating to candidates against stronger climate-related regulation. In recent years, pressure from investors and leading asset managers to consider corporate lobbying and political financing as risks to the environmental, social and governance (ESG) performance of companies has had a major influence on companies' business strategies. In the climate policy area, the number of shareholder proposals concerning corporate political engagement disclosures has increased significantly over the last decade, to become one of the most popular types of shareholder resolutions put to a vote (InfluenceMap, 2021[46]; Glass Lewis, 2021[47]). More disclosure on lobbying spending and political contributions – along with greater transparency on ESG goals and results – would allow investors and other stakeholders to evaluate how, for example, lobbying and political spending activities and sustainability initiatives might conflict. The Securities and Exchange Commission in the United States is currently exploring the links between political spending disclosures and ESG performance, and discussing the implementation of mandatory disclosure requirements (SEC, 2021[48]).

Countering illicit trade in environmentally dangerous goods is also crucial. While the liberalisation of international trade and reductions in trade barriers have brought significant benefits, they have also increased opportunities for trade in illicit products, not only depriving governments of tax and related revenues, but also posing significant environmental risks. Such illicit trade includes illegal wildlife trafficking, trade in substandard chemicals and pesticides, illicit trade in sand, and waste trafficking (OECD, 2016[49]; OECD, 2018[50]; OECD, 2019[51]). As criminal networks are quick to adapt their operations to avoid detection and circumvent law enforcement, governments need to step up their efforts, including strengthening cross-border information sharing among law enforcement authorities, analysing the policies that may inadvertently create business opportunities for criminals, and finding ways to shrink the market for illicit products by reducing consumer demand for such goods (OECD, 2018[52]).

4.3.5. Effective public communication on climate and environmental action

To achieve the green transition, governments will need to transform how they use public communication to inform and engage with the public, and to prevent and react to the spread of mis- and dis-information. Public communication is the main vehicle for governments to provide accurate, reliable and timely information and data on environmental pressures in a way that can resonate with society. Good public communication promotes awareness, fosters a well-informed public debate, helps prevent damaging narratives from gaining ground, and provides an avenue for listening to and understanding public demands and concerns (OECD, 2021[53]). For climate change in particular, policy design and implementation should be based on a free flow of information and data among governments, businesses, individuals and civil society, including journalists, the scientific community and academia. Pillar 1 of the OECD Reinforcing Democracy Initiative centres on the key challenges for governments in combating misinformation and disinformation (see Chapter 1).

Governments need to be able to communicate complex policy narratives in compelling and meaningful ways. Some countries are taking steps in this direction. Scotland's Turning the Tide campaign highlighted efforts to protect UK marine life and clarified the relevance of the topic to citizens. The EU Council's Taking the Lead on Climate Change campaign provides clear information on the facts, effects, actions taken and next steps regarding climate change.

Public communication needs to help strengthen the link between awareness, intention and action on climate change and other environmental threats. Pro-environmental behaviours may not be always adopted by those professing pro-environmental attitudes and beliefs (Dryzek, Norgaard and Schlosberg, 2011[54]; Eom, Kim and Sherman, 2018[55]). While OECD data shows that raising awareness is the leading objective of the public communication function, a greater focus on using communication strategically to achieve behaviour-specific objectives (such as improving the delivery of public services, engaging stakeholders, or improving the implementation of reforms) may be more effective (OECD, 2021[56]). For example, the UK Government's "Plant for Our Planet" campaign focused on encouraging people, businesses and communities to take specific action, such as planting trees, as part of the government's broader conservation initiatives.

Sharing information on its own is not always enough to lead to behavioural change. Governments should be attentive to how mis- and dis-information on green policies may undermine fact-based engagement and diminish buy-in for reforms. Efforts to build an information environment conducive to constructive policy discussions are complicated by rapid changes in how the public consumes and shares information. These changes affect *who* and *what* sources of information and data citizens trust, while the rise of social media platforms in particular has facilitated the spread of mis- and dis-information (Matasick, Alfonsi and Bellantoni, 2020[57]). When it comes to climate change, dis-information can seek to discredit climate science that sets the basis for policy measures or cast doubt over the urgency of crisis, eroding support for much-needed reforms. Further, commercially and politically motivated actors, both domestic and foreign, can use platforms to skew public debate. Research suggests that highlighting the scientific consensus can be one way to counter misinformation and increase public acceptance of the need to address climate change (Lewandowsky, 2020[58]).

Communicating effectively about the climate emergency and combatting related misinformation require preparedness and prevention. Lessons learned from the COVID-19 pandemic will be useful in this regard. Indeed, media and public discourse around natural catastrophes are especially vulnerable to false narratives, as has been seen in relation to wildfires, floods and other extreme weather events. Building preparedness to communicate around these increasingly frequent events, especially anticipating and "pre-bunking" harmful messages, will mitigate the impact of false narratives and encourage support and compliance with green policies (Lewandowsky, 2020[58]).

Beyond direct public communication responses, governments should support the timely and effective sharing of information and data and the full range of policy options to address disinformation around environmental pressures, notably climate change. One such option is identifying regulatory and legal responses to disinformation while protecting freedom of speech. Others include building constructive and transparent relationships with online platforms and fact-checkers; expanding media and information literacy efforts; promoting the understanding of the scientific data and trade-offs faced in the climate discussion; supporting public participation and fact-based journalism; and building a common narrative to inform citizens and direct them to trusted information and data sources. Ensuring that messages and messengers are culturally aligned and relevant to the audience is particularly important to climate communication (Lewandowsky, 2020[58]).

Agreeing upon common data standards to monitor climate change, proactively publishing – with unrestricted access – data on climate change for analysis and re-use;[3] and identifying the provenance of both trusted and untrusted data sources are among the actions governments can take to fight dis- and mis-information on climate change. Last but not least, behavioural insights (BI) can be used to reinforce the governance of public communication and to fight misinformation.

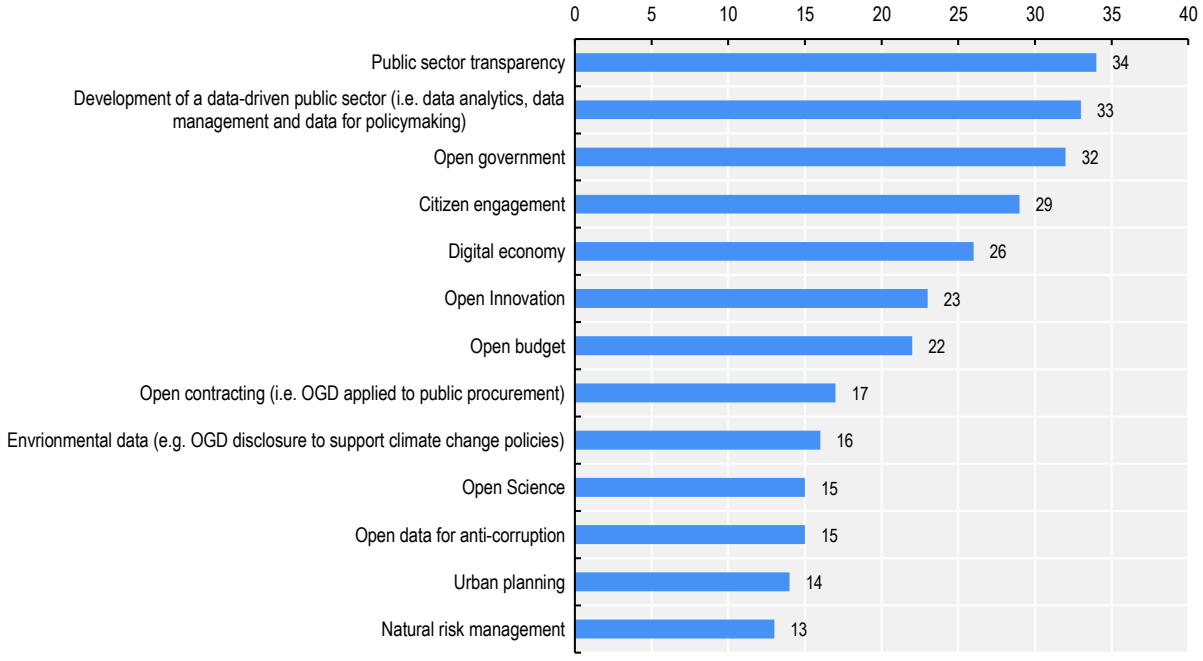
4.3.6. Accountability for governing green

Strengthening public sector accountability mechanisms will be critical for effective climate action and the green transition. However, developing such mechanisms is not always straightforward, particularly as they need to involve a number of different actors and actions, as well as a wide range of data from numerous institutions and sectors.

At the international level, there are a number of accountability mechanisms that make government action more transparent. For example, as part of the Horizontal Project on Climate and Economic Resilience, the OECD has established the International Partnership on Climate Action (IPAC). IPAC's Climate Action Dashboard features key indicators to track progress towards climate objectives and provide a snapshot of country climate action.[4] Ensuring that such mechanisms have the right governance arrangements, tools and data is a major challenge, but is crucial to their credibility and reliability.

Systematic efforts to monitor climate policies and commitments will require access to and sharing of data on environmental issues within the public sector and across sectors at both domestic and international levels. Within the public sector, the generation, sharing of and access to different types of data (administrative, agricultural, water, natural risks) in different formats (geo-referenced, standardised, open) and through different means (e.g. shared data infrastructures, IoT, the cloud) is critical. As of 2018, only 16 out of 34 countries included environmental data to support and monitor climate change policies in their open government data policies (Figure 4.6). The *OECD Framework for a Data-Driven Public Sector* (OECD, 2019[59]) and OECD work on open government data provide guidance on how to enable access to and sharing of data on the green transition.

Figure 4.6. Elements covered in open government data policies/strategies



Note: Based on information provided by 31 OECD countries and 3 OECD partner and other economies (Colombia, Lithuania and Peru) in response to the OECD Survey on Open Government Data 3.0 (2017), Section 2, Question 5. Does the single central/federal OGD policy/strategy or central OGD initiatives cover the following areas?

Source: OECD (2018[60]), *Open Government Data Report: Enhancing Policy Maturity for Sustainable Impact*, OECD Digital Government Studies, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264305847-en.

Better monitoring and reporting on domestic environmental action is also needed. Governments should report to the public on progress towards meeting climate-related and environmental goals – regulator monitoring is critical to gather public feedback and promote awareness of results. An emerging area of work looks at whether and how public sector organisations make climate-related disclosures in financial statements. The majority of OECD countries that conduct green budgeting have adopted transparency and accountability measures to guide public institutions in achieving green goals. For instance, France and Italy prepare green budget statements as part of each government's budget to show how the budget aligns with green objectives. Green budget statement can be used by parliament and stakeholders to assess how a budget contributes to climate or environmental objectives. In this way, transparency supports accountability. Green budgeting helps provide parliaments with additional resources when scrutinising budget proposals. It also provides resources for oversight by independent institutions such as fiscal councils and environmental commissions. For example, in Ireland, the Irish Climate Council provides recommendations to the government, including on the methodology used, with a 'comply and explain' principle binding the government.

Internal audit and oversight functions within government play a critical role in ensuring that public integrity is not compromised in climate policies and investments and that these, in turn, produce the intended results. Supreme Audit Institutions (SAIs) can play an important role in assessing national governments' preparedness for the impacts of climate change and conducting performance audits of government programmes that contribute to climate change mitigation and adaptation. The challenge for governments is to ensure that SAIs and internal audit functions have the capacities and resources they need to protect public funds intended for climate change mitigation and adaptation against fraud and other integrity risks.

Justice systems also have a role in improving accountability in environmental action. Environmental claims are increasingly common and environmental justice has gone from a niche law discipline to a major policy concern. The fundamental right to a healthy environment can now be found in the constitutions of over 100 countries, and thousands of environmental treaties (multilateral and bilateral) exist among countries (International Environmental Agreements Database, 2021[61]). To deal with the growing demand stemming from these legal provisions, many countries have established specialised environmental courts. For example, the New Zealand Environmental court, is staffed with judges and environment commissioners trained in a variety of scientific-technical, business, and agricultural fields as well as mediation. This has allowed to create consistent environmental jurisprudence for all citizens, including for indigenous peoples. In the OECD, other examples include the New South Wales, Australia, Land and Environment Court; and Chilean environmental courts. UNEP deems this "explosion" of environmental courts to be the most remarkable change to environmental justice in the 21st century (UNEP, 2016[62]).

The growing number of environmental commitments adopted through international treaties and national legislation requires strong justice systems to ensure their enforcement. The increasing public call for environmental justice can only be answered by a responsive judiciary that is able to hold governments and companies accountable for respecting environmental regulations and protect fundamental rights to a quality environment. These cases are already reaching countries' highest courts. A number of landmark cases have recently awarded victories for climate litigation (Box 4.3). There is also an increasing global recognition of intergenerational concerns posed by climate change in legal judgements (OECD, 2020[37]). Countries including Australia, the Netherlands, Norway, the United Kingdom and the United States provide examples of legal judgements that can set the scene for future policy making on intergenerational justice. The Supreme Constitutional Court in Germany, for instance, asked the government for more ambitious climate protection measures to protect future generations (German Federal Constitutional Court, 2021[63]).

Balancing the different interests in these cases, which are likely to multiply, and providing effective and timely remedies for citizens and businesses seeking to protect their right to a quality environment, require increasingly efficient and effective justice systems. Steps countries can take to achieve this include:

- **Promote specialisation and training in environmental matters for judges.** Judicial specialisation has shown to be beneficial to efficiency and to coherence in rulings in many areas (Council of Europe, 2012[64]). However, the majority of judges currently have not been trained in international and national environmental laws.
- **Invest in the overall efficiency and effectiveness of the justice system.** The growing demand for effective case resolution in the area of environmental litigation makes it pressing to invest in the capacity of the system to respond adequately.
- **Enhance accessibility and people-centricity of the justice system.** Maintaining citizen trust in public institutions to deal with the climate emergency will also depend on preserving access justice concerning environmental law (OECD, 2019[65]).

Box 4.3. Landmark cases on environmental justice

Australia

The Federal Court of Australia recently found that the Federal Minister for the Environment had a duty of care to protect young people from the potentially catastrophic events of climate change. In a decision considered the first of its kind, the Court ruled that the Minister had an obligation to consider the effects of harmful CO^2 emissions resulting from the extraction of coal in the Vickery Extension Project before approving it. The claim was brought on behalf of eight Australian children, as representative of “all children who ordinarily reside in Australia”. The judgment has been appealed by the Minister.

France

In July 2021, the highest administrative court in France (*Conseil d’État*) rendered its first decision related to environmental commitments of the Government under the Paris Agreement. Prompted by the commune of Grande-Synthe (Nord), a coastal town that could be severely affected by rising sea levels, and several climate action organisations (Oxfam France, Greenpeace France, Notre Affaire A Tous, Fondation Nicolas Hulot), the Council ordered the Government "to take all necessary measures to curb the curve of greenhouse gas emissions (...) in order to ensure its compatibility with the objectives" of France by March 31, 2022. Given the current levels, this would require reducing gas emissions by 40% in the following 9 months.

The Netherlands

The *Urgenda Foundation v. the Netherlands* (2019) case became a landmark environmental case when the Dutch Supreme Court ruled that by failing to reduce greenhouse gas emissions by at least 25% by 2020, the Dutch government would be acting unlawfully under Articles 2 and 8 of the European Charter of Human Rights. In response, the Dutch government vowed to reduce the capacity of its remaining coal-fired power stations by 75% and implement a EUR 3 billion package of measures to reduce Dutch emissions by 2020. This case has provided a growing impetus to legal arguments based on human rights in climate litigation procedures.

Note: These highlights are by no means exhaustive of the existing cases of relevance in the field of environmental law. For further information, see for instance: Grantham Research Institute on Climate Change and the Environment and Centre for Climate Change Economics and Policy, London School of Economics and Political Science. (2020) *Global trends in climate change litigation: 2020 snapshot*. Sources: *Sharma by her litigation representative Sister Marie Brigid Arthur v Minister for the Environment* [2021] FCA 560, available at fedcourt.gov.au; *Urgenda Foundation v. the Netherlands* (2019) ECLI:NL:HR:2019:2006 (available here); *Le Conseil d'Etat statuant au contentieux (Section du contentieux, 6ème et 5ème chambres réunies)* N° 427301 (judgment available at: https://www.conseil-etat.fr/en/news/greenhouse-gas-emissions-the-government-must-justify-within-3-months-that-the-reduction-path-to-2030-can-be-achieved.

4.3.7. The gender-environment nexus

There is increasing recognition of the interlinkages between gender equality and environmental sustainability. Environmental degradation affects men and women differently often as a result of gender-differentiated roles and behaviours in society, as well as women's increased representation among the world's poor (OECD, 2021[66]). Understanding how gender and the environment are interconnected can help to uncover underlying inequalities in multiple areas, especially related to ownership and control of natural resources, energy, transport, water, housing, and land-use. Very often, women and girls have limited access to or control over the above elements and are therefore more likely to be exposed to disaster-related risks, and less able to adapt to environmental degradation (OECD, 2021[66]).

In addition, women can play a key role in promoting sustainable development, production and consumption and the achievement of environmental goals. They often play an active environmentalist role at the community and grassroots level in countries around the world, and tend to be overrepresented among the leading global campaigners against climate change (OECD, 2021[66]).

4.3.8. Enabling governments to 'go global' on environmental challenges

Climate change and biodiversity loss are global in nature. Yet, national governments can essentially act only within national boundaries, making international co-operation and co-ordination essential. Despite increasing efforts – and some results – governments still struggle to act in a concerted manner. This lack of collective action may create a sense that domestic governments do not have the tools or capacity to address the issues that are of critical and growing importance to citizens' lives.

Outside of the global institutional governance of environmental issues taking place, for instance, under the UN Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity (CBD), which is beyond the scope of this chapter, governments have to step up their capacity both to act globally and to handle the domestic consequences of cross-border issues. This requires a reimagining of traditional public governance and rule-making processes that are still very much designed following "siloed" approaches.

Strengthening governments' ability to act at a global level is crucial not only for tackling climate change, but also an increasing number of challenges that cannot be successfully addressed by governments acting alone, such as international tax, migration, trade and illicit trade, and international corruption. It involves boosting capacities in the civil service, establishing frameworks and processes to feed up and down the hierarchical ladders on global issues, and embedding a stronger international perspective in regulation. Pillar 3 of the OECD Reinforcing Democracy Initiative (see Chapter 3) takes a broader look at how governments can embrace the global nature of the challenges facing public institutions.

Nationally based approaches to climate change and sustainable development often provide only limited insights into transboundary policy effects or the impact of countries' actions on global sustainability**.** Nevertheless, there is a wide range of indicators, regularly produced by the OECD and others, of the economic (e.g. linked to official development assistance, tariff rates and agricultural support measures); social (e.g. linked to data on migration and remittances); and environmental (e.g. linked to carbon and water footprints) effects of domestic policies that are felt beyond national borders. Governments could make better use of these to design and implement coherent climate-related policies that benefit more people in more countries.

A number of countries have gained experience with anticipating, assessing and monitoring transboundary impacts as part of their efforts to improve policy coherence for sustainable development. This experience could be applied to the green transition, complemented and reinforced by international co-operation, agreements and commitments that foster sustainable development globally. For example, in the field of cross-border air pollution, the Canada-United States Air Quality Agreement and UNECE's Convention on Long-Range Transboundary Air Pollution show how countries can put in place agreements to advance co-operation on transboundary challenges (Kauffmann and Saffirio, 2021[67]).

One way to take into account transboundary impacts is through international regulatory co-operation (IRC). Yet, less than one-fifth of OECD members systematically reflect international dimensions in their domestic rule-making activities (OECD, 2021[68]). By adopting IRC strategies with clearly defined roles and responsibilities, and systematically applying an international lens in rulemaking, governments will be better able to both contribute to and benefit from global co-operation in addressing climate change. Governments can learn from each other and, when needed, develop co-ordinated and consistent regulatory responses while preserving their national prerogatives (Box 4.4).

International co-operation will also be crucial in helping developing countries manage short-term trade-offs associated with a green transition. Creating the right conditions for mobilising domestic, international and private investment will be critical. These include strengthening international and domestic green finance and investment by better targeting all types of development finance; promoting green technology and co-operation; building capacity for domestic green innovation and adoption; developing intellectual property rights regimes; and facilitating trade in green goods and services by removing tariff and non-tariff barriers.

Innovative public sector structures that allow for collaborative approaches may yield lessons for international co-operation on climate issues. Existing public institutions and approaches may not be sufficient for managing complex and transboundary policy problems. Governments need to find new ways of working together, including exploring new types of governance arrangements, experimenting with novel cross-border policy approaches, engaging the global public through democratic processes, developing interoperable systems for the free flow of information and data, and collectively designing and delivering new types of cross-border policies and services.

Box 4.4. Transforming rulemaking procedures for an interconnected world

1. **Establish an international regulatory co-operation (IRC) strategy and its governance**:
   - Develop a whole-of-government IRC policy / strategy
   - Establish a co-ordination mechanism in government on IRC activities to centralise relevant information on IRC practices and activities and to build a consensus and common language
   - Enable an IRC conducive framework – i.e. raise awareness of IRC, build on existing platforms for co-operation, reduce anti-IRC biases and build in incentives for policy makers and regulators
2. **Embed IRC throughout domestic rulemaking:**
   - Gather and rely on international knowledge and expertise
   - Consider existing international instruments when developing regulation and document the rationale for departing from them
   - Assess impacts beyond borders
   - Engage actively with foreign stakeholders
   - Embed consistency with international instruments as a key principle driving the review process in *ex post* evaluation and stock reviews
   - Assess *ex ante* the co-operation needs to ensure appropriate enforcement and streamline "recognisable" procedures
3. **Co-operate internationally – across levels:**
   - Co-operate with other countries to promote the development and diffusion of good practices and innovations in regulatory policy and governance
   - Contribute to international fora which support regulatory co-operation
   - Use mutual recognition in combination with international instruments
   - Align IRC expectations across various policy instruments, including in trade agreements

Source: (OECD, 2021[69]) and (OECD, 2022[70])

Finally, momentum for climate and environmental action at the global level is building outside of international organisations. Intergovernmental fora, such as the G20, have become more prevalent and often provide political momentum for wider international negotiations. More and more standards are being developed and adopted at a global level in the private sector, and civil society, through NGOs and even individuals galvanise public support and influencing international outcomes. Governments need to adapt their role in orchestrating international action on climate and the environment accordingly. They also need to consolidate the messages of these multiple fora in order to bring a clear message on international climate- and environment-related action back to their citizens.

4.4. Key area 2: Using the right tools for climate and environmental action

Governments need to make the best use of available governance tools to achieve the structural changes needed for the green transition. Green budgeting, regulations, infrastructure planning procedures and public procurement should be unlocked to align government policies, public investment, consumption and taxation with green objectives. The systematic use of these governance tools would also help reinforce trust in climate action by strengthening the climate governance framework and demonstrating commitment. To do so, governments will also need to improve planning, make sure that civil servants have the needed skills and approaches and tap into innovative governance approaches.

4.4.1. Key transformation tools

Improving infrastructure governance for greener infrastructure

Infrastructure plays a unique role in emissions levels. International studies attribute 50% to 70% of greenhouse gas emissions to infrastructure (G20 Infrastructure Working Group (forthcoming), 2021[71]). Of this, only around 20% is related to the construction of physical infrastructure; the other 80% is due to the operations and use of infrastructure (Saha, 2018[72]). Infrastructure decision making determines use patterns, from commute distances to incentives for the installation of solar panels. Influencing the behaviour of infrastructure developers, users and the economy can thus help reduce emissions. Infrastructure's share of carbon emissions is growing, making it an essential area for climate action. Most existing energy and transport infrastructure was designed and built for a world of cheap and abundant fossil fuels, contributing to economic growth in many regions but also to greenhouse gas (GHG) emissions. In Europe, the energy sector represented 27% the EU's greenhouse gas emissions in 2019, with transport (including international shipping and aviation) emissions at 32%, up from 24% in 2000.[5]

Given the long life of infrastructure assets, investment decisions made today on the type of infrastructure (high- or low-carbon) will determine whether the goal of reaching net zero emissions will be achievable – in particular given the rapid rolling-out of recovery investments. In the shorter term, choices made on infrastructure systems and public expenditures will have immediate consequences in terms of halting the dramatic loss in biodiversity and making infrastructure more resilient (European Commission, 2021[73]).

Climate change has increased the frequency of climate-related shocks (floods, extreme temperatures, geological hazards, security threats or other risks) that, in turn, are testing the limits of infrastructure resilience. For example, sea level rise will affect building areas, while higher temperatures will require higher heat tolerance for infrastructure such as railway tracks. Infrastructure assets are already subject to value depreciation due to gradual wear or aging, but infrastructure failures due to climate-related disasters have an immediate impact on citizens' lives and well-being and on value chain continuity. Upfront planning and investment is required to ensure that both new and existing infrastructure can withstand external shocks throughout their planned lifespan.

Building resilient, green and inclusive economies and societies requires a new governance approach for infrastructure: a complete transformation of how infrastructure is planned, delivered and used. Infrastructure needs to be climate-proofed against potential disruptions, including impacts of climate change itself, and against changing economic circumstances, such as strained public finances and increased debt. The recently published OECD Building Resilience report, which supports the Italian G20 Quality Infrastructure Agenda, offers a new governance approach for infrastructure based on the *OECD Recommendation on the Governance of Infrastructure.* This approach seeks to get the best out of an asset over its life cycle, across functions and tasks and the entire infrastructure system/network, using new technologies and nature-based solutions (OECD, 2020[74]) (Box 4.5).

Box 4.5. Greening governance of infrastructure investments

Infrastructure governance has a key role to play in shaping a green transition. Future investment decisions will need to avoid further lock-in of carbon emissions and promote environmentally sustainable technologies. Planning and decision-making frameworks that are responsive to these rapidly evolving needs and contexts can allow governments to future-proof investment choices and improve the environmental sustainability of the nation's infrastructure.

The *OECD Recommendation on the Governance of Infrastructure* provides guidance for policy makers and key stakeholders on the institutions, processes, and policy tools needed to effectively deliver climate and environmental policy goals in an integrated manner, accelerate progress towards a sustainable and inclusive recovery, and ensure affordable and equitable access to infrastructure services. The Recommendation lays out ten pillars that can support governments in linking infrastructure decisions and plans to climate objectives in order to unlock a green transition.

Source: OECD (2020[74]), "OECD Recommendation on the Governance of Infrastructure", *OECD Legal Instruments*, OECD-LEGAL-0460, OECD, Paris, https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0460

The major challenges for greening infrastructure include governments' capacity to link infrastructure planning to climate objectives; to put in place criteria for selecting infrastructure projects in line with overall objectives; and to deliver, operate, maintain, upgrade or retire infrastructure assets in ways that accelerate the reduction in its carbon emissions – as well as the broader environmental footprint – while influencing the behaviour of citizens and businesses to make more sustainable choices.

In the planning phase, developing a long-term strategic vision for infrastructure that aligns with long-term policy objectives – including commitments on environmental protection and climate change mitigation – is crucial to help governments identify and address infrastructure service needs in a timely and coherent way. As highlighted by the *OECD Recommendation on the Governance of Infrastructure*, to implement this long-term vision, countries should develop an integrated national infrastructure plan, prioritising all projects according to the highest cost-benefit ratio based on economic, environmental and social factors. This plan should integrate maintenance and resilience (OECD, 2021[75]), including national climate adaptation planning; critical infrastructure protection programmes; and spatial planning. It should also cover all aspects of a sound

asset management system, ranging from asset management policy and strategy to key enablers and opportunities such as natural based solutions and technological innovations (OECD, 2021[76]).

Most OECD countries are aware of the need to align infrastructure plans with broader sustainable development objectives, and 73% of them align their long-term infrastructure plan with environmental and climate action policies (OECD, 2021[6]). In most of these countries, the aim is to invest in important projects that enable the implementation of broader sustainability initiatives (67%), followed by adapting existing infrastructure to improve environmental performance, and identifying cross-sector synergies to reduce negative environmental impacts (57%). Still, fewer countries have adopted resource efficiency targets in the construction and operation of infrastructure (40%) or research and development to promote environmentally friendly infrastructure (33%) (see Key Indicators - Figure 4.2, Panel D).

The prioritisation and selection of infrastructure projects need to integrate climate and environmental considerations. In light of international and national climate targets and new regulations such as the Paris Agreement, the European Green Deal and the EU Taxonomy, it is paramount to introduce these considerations in new investment appraisal tools to quantify investment impacts in order to select and prioritise projects, and to integrate these tools into public investment process. Governments face a substantial task in determining which investment possibilities can best contribute to the achievement of climate policy goals. Only 19 OECD countries report that they have a shortlist of priority projects, with most driven by some combination of cost-benefit analysis results, infrastructure plans, and strong political backing (OECD, 2019[77]). To accelerate the climate transition key prioritisation instruments need to fully incorporate climate considerations, climate proofing infrastructure (Box 4.6).

Box 4.6. Climate-proofing infrastructure and implementing recovery plans

Climate ambitions and recovery plans need to be implemented successfully and on time. Governments must turn their pledges into clear and credible policy actions and strategies today. Infrastructure projects are an essential aspect of climate action and should be designed for a climate-neutral and climate-resilient future. The operation, maintenance and final decommissioning of any project should be carried out in a climate-neutral way, which also implies circular economy considerations, such as the recycling or repurposing of materials. Adaptation measures building on climate risk assessments will help ensure climate-resilient infrastructure projects.

The European Commission (EC) has recently published a methodology on the climate-proofing of infrastructure to help mainstream climate considerations in future investment and infrastructure projects (including buildings, network infrastructure, built systems and assets). This methodology should be followed in the context of InvestEU direct financing in order to be aligned with the Paris Agreement and the EU climate objectives.

The OECD supports countries' efforts to strengthen infrastructure governance frameworks to lead the green transition. In Italy, the collaboration between the OECD, the EC and the Ministry for Sustainable Infrastructure and Mobility through a project to supports reforms by the Italian Government under the Recovery and Resilience Plan and the attached Next EU funds.[1] In Ireland, the OECD with the EC and the Department of Public Expenditure is developing an integrated framework and appropriate methodological tools to prioritise investment and integrate climate considerations in sectors such as transport and coastal protection.

Note: As required by Article 8(6) of the InvestEU Regulation (Technical Guidance on the climate proofing of infrastructure in the period 2021-2027)

1. The OECD team supporting this project includes the Public Governance Directorate, the Environment Directorate and the International Transport Forum.

Source: EU (2021) Technical Guidance on the climate proofing of infrastructure in the period 2021-2027

Infrastructure governance is also required for effective sustainable decision making and public acceptance of green solutions. For example, nature-based solutions (NbS) offer innovative ways to build infrastructure sustainability and resilience. Such systems support both natural and managed ecosystems that provide infrastructure services with fewer negative impacts on the environment than traditional "grey" infrastructure. Without the appropriate infrastructure governance, however, many NbS solutions may end up as one-off interventions and at a relatively modest scale. To fully benefit from these innovative approaches, governments need to understand their uses and limitations and modernise their decision-making systems to allow for more agile and sustainable solutions.

In the operations and maintenance phase, the monitoring of infrastructure assets plays a key role in ensuring infrastructure quality and resilience as well as progress on climate emissions objectives. Efficient monitoring and maintenance of infrastructure assets can help slow asset deterioration, prevent loss of asset value, and reduce costs. Yet, fiscal limitations put increasing pressure on local authorities to cut costs that may translate into a lack of inspections and monitoring of infrastructure assets. At the same time, consumers' service quality expectations are rising, with users of infrastructure expecting better information and management.

The use of "big data" and scenario analysis to improve infrastructure monitoring will help enable greener, more agile interventions that ensure effective, safe and accessible infrastructure services. The OECD's new governance approach for infrastructure promotes the use of new technologies and data, as well as nature-based solutions for infrastructure (OECD, 2021[78]). It shows how new technologies and data science are transforming how infrastructure is planned, operated and maintained. In particular, real-time monitoring improves infrastructure resilience by ensuring the continued operations of critical networks such as utilities, transport and telecommunications during climate-related disasters. Automation and smartphones reduce monitoring costs, offering alternatives to traditional infrastructure design, construction and maintenance, while predictive maintenance can extend the life of the asset while also ensuring efficient budget allocation and avoiding costly – and polluting – project renewals. Furthermore, InfraTech-enabled sensors and monitors can complement administrative input and output data with new, outcome-based data for monitoring and decision making. Still, the take-up of digital technologies requires governments to address a series of challenges, including legal barriers (e.g. quality and adequacy of regulatory frameworks), institutional barriers (e.g. the structures governing the operation of regulators), decision-making processes (e.g. integration of risk management) or technology risks (e.g. privacy, data protection and security).

Given current constraints and the impact of stimulus programmes on public budgets, alternative and diversified financing is needed to reach climate objectives. Budgetary treatment plays a crucial role in planning and securing stable funding for infrastructure, and public interventions should focus on creating incentive schemes to better mobilise private financing. Different delivery models (feed-in-tariffs, premium tariffs, quotas, tenders) and the quality of support schemes define the role of the private sector in providing construction, maintenance and operations services. Moreover, the accounting treatment of assets can create incentives for infrastructure owners to maintain their assets. Taking a life-cycle approach to infrastructure planning will not only allow governments to better attract long-term backing, such as institutional investors but will also help them integrate a longer-term perspective on environmental impacts into their own decision making ultimately driving down the overall costs of projects.

Ensuring that private sector investment in public infrastructure promotes green goals is critical, and requires adaptations by both the public and the private sector. On the one hand, the public sector needs to provide information for infrastructure investors on policy objectives and the required characteristics of assets in terms of environmental, social and governance (ESG) impacts over the long term. On the other hand, investors need to integrate ESG considerations in their investment frameworks to manage ESG-related risks and opportunities (OECD, 2021[79]). The public sector can support this by providing environmental objectives against which investors can align their investment strategies. For example, the EU Taxonomy makes it possible to classify certain economic activities as environmentally sustainable.

From the public sector perspective, several international standards and tools have been developed to integrate sustainability and resilience aspects into infrastructure development. These tools encourage and reward projects that have positive climate, environmental and social impacts, while reducing their negative impacts. Common standards allow governments to: (i) identify a project's impacts; (ii) introduce mitigation measures to address these impacts; and (iii) where possible, recognise opportunities to improve the project's sustainability performance (European Commission, 2021[80]).

Despite broad recognition of the importance of ESG criteria and increasing interest both by governments and institutional investors in incorporating these factors into infrastructure investment decision making, the application of these criteria in asset valuation remains at an early stage. As highlighted in the *G20 Principles for Quality Infrastructure* developed in 2019, both the positive and negative impacts of infrastructure projects on ecosystems, biodiversity, climate, weather and the use of resources should be incorporated into the infrastructure investment process. This can be supported by better public-private dialogue on the convergence of ESG standards. Ultimately, providing more standardised information would allow governments to better understand and respond to investor interest.[6]

Leveraging the public sector's purchasing power: green procurement

Government procurement is one of the ways the public sector has a concrete impact on the environment in which citizens live. Given procurement's economic significance, government's position as the prime client of the private sector in many business areas, and the sheer variety of public purchasing, outcomes-based public procurement strategies can significantly contribute greener societies and economies. Furthermore, all levels of government have a part to play.

Public procurement is an important strategic tool for achieving government's environmental goals. Among 22 OECD-EU countries for which data is available, public procurement spending increased from 13.7% of GDP in 2019 to 14.9% of GDP in 2020 (OECD, 2021[6]). Governments can lead the way in supporting environmental action by taking a greener approach to public buying. Countries have already taken steps to align their procurement spending with strategies to tackle the climate crisis. The United States, for example, directed the federal government, through an Executive Order, to align its management of federal procurement and real property to achieve a 100% clean energy economy by 2035 and reach net zero emissions no later than 2050 (Executive Office of the President, 2021[81]). Similarly, in Slovenia, since the adoption of the Decree on Green Public Procurement in 2011, all contracting authorities must meet the stated environmental criteria when awarding a public procurement procedure for any of the 22 green subject matters specified by the Decree.

Public procurement provides a major incentive to innovative companies by allowing them to invest in the necessary R&D without incurring demand uncertainty. When public administrations aggregate public needs in tenders, they provide suppliers with increased certainty regarding the demand for green innovative products. The public sector can thus create, escalate or consolidate innovative green markets. Beyond greening government's own operations, public administrations also act as a lead consumer; these practices then diffuse to markets and private consumers.

Leveraging governments' purchasing power to achieve environmental benefits requires a whole-of-government approach considering that procurement spending is largely decentralised in OECD countries: sub-national governments account on average for 63% of total procurement expenditure. Designing a strategy or framework to support environmental objectives in public procurement is important to ensure policy coherence and consistency among procurement practices across levels of governments. All OECD countries have such a strategy or regulatory framework to promote environmental objectives in public procurement.

Embedding rules and standards in tender processes can help promote innovation and sustainability in public procurement. This is the case in the Netherlands, where only sustainable cement is allowed in building projects and where "Most Economically Advantageous Tender methodology (MEAT)" is used to

reward tenders that include reductions in emissions and a lower overall environmental impact. Similarly, as of 2021, bidders in the UK for large public procurement contracts (those exceeding GBP 5 million per annum) are required to produce carbon reduction plans setting out how the organisation intends to achieve 'net zero' carbon emissions by the year 2050.

In sectors where the public sector is the largest consumer, the high sustainability standards set in the procurement process will also benefit other categories of consumers. This might happen in sectors such as health and education, where the allocation of resources can be improved (OECD, 2006[82]) (Sandra Black, 2021[83]). Economies of scale can also create a market that makes more responsible products, such as low-emission products, more accessible to consumers (OECD, 2019[84]). Acknowledging this, Canada's Green Public Procurement strategy (Government of Canada, 2018[85]) highlights that, where decisions are made to realise specific environmental outcomes through procurement, it is expected this will: i) demonstrate environmental leadership and influence industry and citizens to use environmentally preferable and climate-resilient goods, services and processes; and ii) stimulate innovation and market development of, and demand for, environmentally preferred goods and services, making these available and mainstream for other sectors of society (OECD, forthcoming[86]).

The procurement of digital infrastructure can contribute to green digital government by prioritising suppliers that reduce their climate footprint and making them accountable as part of contracting processes. Governments can create incentives for achieving net zero digital emissions, for example by selecting and endorsing environmentally responsible suppliers and by promoting public-private collaboration to identify and endorse environment-friendly digital technologies that help achieve the green transition. Public sector demand can be influential in driving higher standards, especially where common environmental criteria are adopted by many public buyers. Experience points to the importance of market engagement to ensure suppliers are able to meet requirements and that the impact on lifecycle costs for ICT are understood within the purchasing organisation. For example, the Irish green public procurement criteria for data centres address a number of aspects of design, operational lifetime and end-of-life management that can reduce lifecycle costs and the environmental impact. This is particularly important as the growing demand for data centre services also has major environmental impacts, including electricity consumption of ICT in data centres, direct and indirect GHG emissions linked to data centre operations, or the use of high global warming potential (GWP) gases in cooling systems.

Mainstreaming green objectives in government's procurement practices still faces several challenges, however:

- Effective implementation of these strategies and frameworks relies on a public procurement workforce that has the skills and competences to navigate increasingly complex purchases, from defining criteria involving the assessment of environmental externalities to collaborating with the market to identify greener solutions to public needs. Several countries are making progress in this area. The European Commission supports its member states by developing a scalable competency framework for public buyers that can be tailored to specific objectives promoted by countries.
- Public tenders need to better capture the lifecycle costs and environmental impacts of goods and services procured to incentivise the private sector to compete on the green dimensions of their offerings. Asymmetries of information on detailed environmental impacts of goods, services and works procured, and lack of unified pricing instruments in the area of climate change, often leave public administrations unable to award public contracts based on life-cycle costs (LCC) and externalities. Early market engagement can help governments gather data to inform the design of LCC tools, comparing the various environmental impacts of solutions proposed by suppliers, and to award public contracts by taking into account green benefits. For instance, the Procura+ European Sustainable Procurement Network developed a tool to calculate LLC and CO^2 emissions, identifying information the private sector should provide before government designs the evaluation frameworks for awarding public contracts. Early market engagement can also support

public buyers in building more sustainable supply chains respecting environmental standards, especially when enforced by comprehensive contract management strategies and practices.

- Public procurement operations should ensure that all participants involved in the supply chain play by the same rules so that public procurement acts as a positive signal, promoting a "race to the top" business environment. A recent OECD report highlights that subcontractors and other supply chain actors are often not subject to the same strict obligations on environmental criteria as the main suppliers (OECD, 2020[87]). In particular, recognising businesses' efforts to incorporate responsible business conduct (RBC) standards, including environmental ones, in their business models when they are applying for public contracts can help encourage greener public purchases (OECD, forthcoming[86]).
- Governments willing to expand the use of green public procurement should close the data gap currently hampering a holistic measurement of the impacts of green procurement strategies, not only to understand the environmental benefits reaped by greener government operations but also to develop more sustainable economies. Currently, Korea stands out as one of the few OECD countries able to measure the impact of procurement practices across public institutions, evaluate green jobs creation through public procurement and report them against historical records (Box 4.7).

Box 4.7. Monitoring the impact of green public procurement (GPP) in Korea

The Republic of Korea is a frontrunner in using and linking electronic procurement systems and platforms for GPP implementation and monitoring. The early implementation of the Korean Online E-Procurement System (KONEPS), KONEPS e-shopping malls, and the Korea Environmental Industry and Technology Institute (KEITI)'s Green Procurement Information System, combined with the most recent developments of the public procurement data system, enable the automatic collection and reporting of GPP data for all government levels

An important GPP feature in the Republic of Korea is the evaluation of procuring entities against GPP records. The Republic of Korea also promotes supplier engagement and green procurement in the private sector, through voluntary agreements, Eco-Expo Korea, and so on, as the expansion of Korean green markets and companies to the global market is a green industry policy goal.

The Republic of Korea is, together with Japan, one of the few countries to annually measure environmental outcomes of GPP.

Source: Adapted from (UNEP, 2019[88])

Moving decisively to "green budgeting"

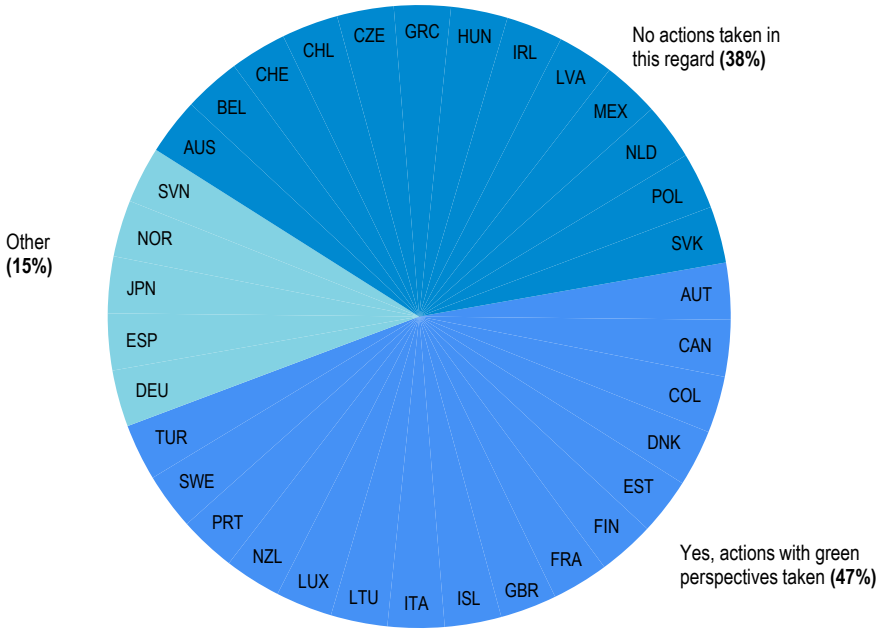
Budgets can be a powerful instrument for aligning policies with climate and environmental commitments at national and global levels. "Green budgeting" refers to the use of budgetary policy making tools to give policy makers a clearer understanding of the environmental and climate impacts of budgeting choices and help them achieve climate and environmental goals (OECD, 2021[89]).

Green budgeting practices are becoming more common across OECD countries. The OECD composite indicator on green budgeting practices notes that, in 2021, 14 out of 38 OECD countries (37%) reported practising green budgeting (see Key Indicators - Figure 4.2, Panel A). Among these 14 countries, practices vary in terms of institutional arrangements, tools, accountability mechanism and the enabling environment: there is no one-size-fits-all approach to green budgeting. While the methods for implementing green budgeting are specific to each country, the results in each element of the above-mentioned composite

indicator are reasonably similar (Blazey, A. and Lelong, M., 2022[90]). The number of countries practicing green budgeting continues to grow.

A number of governments used green budgeting in their COVID-19 recovery efforts, prioritising green policy choices to promote environmental objectives and speed up structural change towards the low-carbon transition (Figure 4.7).

Figure 4.7. Actions taken to integrate green perspectives into COVID-19 recovery measures, as of end June 2020



Note: Data for Israel and the United States are not available. Korea did not reply to the survey question. Romania (other major economy) had not taken actions to integrate green perspectives into COVID-19 measures.
Note on "Other": In Germany, the recovery included measures to facilitate structural transformation of the automotive industry and future-proof value chains; in Japan, recovery efforts included environmentally-responsive measures such as solar power generation facilities and high-performance ventilation equipment at public places; in Norway relevant government actions undergo considerations for environmental consequences; in Slovenia, the government has prepared the recovery plan to include green transition into its growth strategy; in Spain, the Ministry of Ecological Transition has promoted a series of measures directly related to COVID-19 (e.g. sanitary waste management).
Source: OECD and EC (2020), Joint Survey on Emerging Green Budgeting Practices.

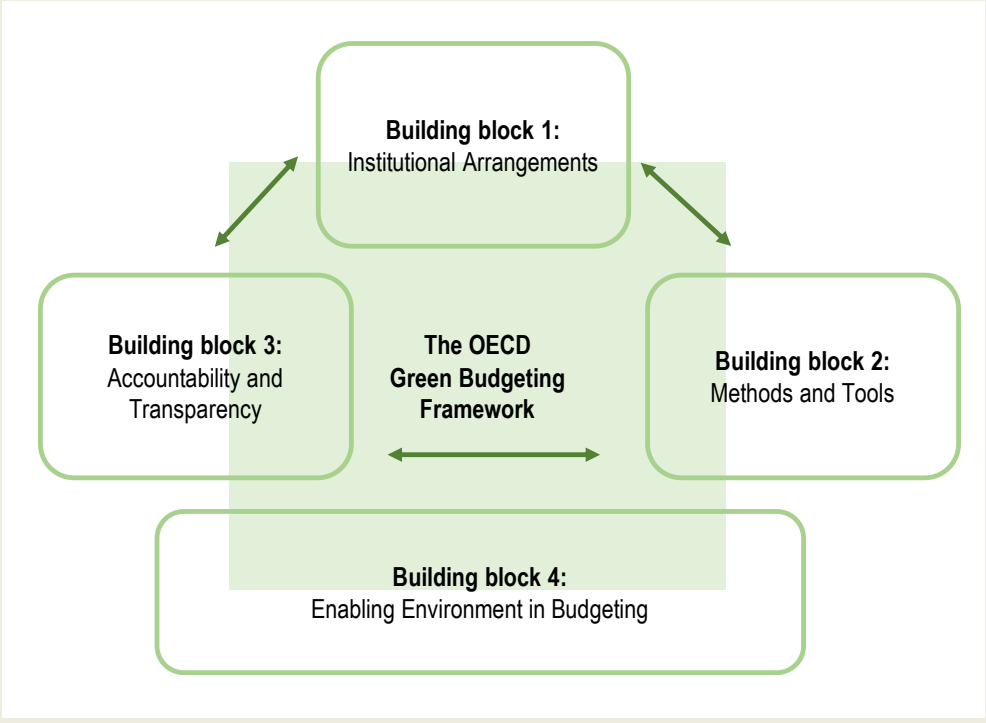
Governments have various ways to bring climate and environmental considerations into budgetary policy making (Box 4.8). These include: (i) the 'greening' of medium-term fiscal frameworks, highlighting linkages among the economy, fiscal policy and the environment; (ii) including climate change in fiscal-risk assessments and management; (iii) tagging budgetary items that contribute – positively or negatively – to the environment; (iv) policy evaluations and environmental impact assessments; (v) green spending reviews; and (vi) and green accounting statements (OECD, 2021[89]) (Table 4.1). To help countries in their expansion of green budgeting practices, the European Commission (EC), the International Monetary Fund (IMF) and the OECD worked jointly to define the main elements and features of green budgeting practices (European Commission/IMF/OECD, 2021[91]). The OECD has also worked with the EC on a stocktaking of existing subnational green budgeting practices in OECD and EU countries to help subnational governments adopt green budgeting practices and improve existing ones (OECD, 2022[92]).

Box 4.8. OECD Green budgeting Framework

The OECD green budgeting framework comprises four building blocks (Figure 4.8). Each building block helps ensure green budgeting is integrated into a government's budget process.

- **Institutional arrangements**: A country's national climate and environmental objectives. Green budgeting helps meet these objectives and is demonstrated through legislative instruments and institutional responsibilities that are integrated into the budget process.
- **Methods and tools**: The means which countries can analyse, assess, forecast, model and evaluate policies and proposals relative to the climate and environmental objectives in the strategic framework.
- **Accountability and transparency** help to embed green budgeting and assure its credibility, through, for example, the scrutiny provided by parliament and oversight bodies such as independent fiscal institutions.
- **Enabling environment in budgeting**: the budgetary governance arrangements within the ministry of finance and other ministries help ensure that green budgeting can deliver results.

Figure 4.8. The four building blocks of the OECD green budgeting framework



Source: OECD (2020[93]), *OECD Green Budgeting Framework*, OECD, Paris, http://www.oecd.org/environment/green-budgeting/OECD-Green-Budgeting-Framework-Highlights.pdf.

Table 4.1. Commonly used tools by countries practising Green Budgeting, 2021

		Austria	Canada	Colombia	Denmark	France	Ireland	Italy	Luxembourg	Mexico	Netherlands	Norway	Portugal	Sweden	United Kingdom
Environmental impact assessments	*Ex ante*	•	•		•	•	•	•	•		•			•	•
	Ex post	•		•	•		•	•	•		•			•	
Green budget tagging	*Ex ante*					•	•	•	•	•		•			
	Ex post			•		•	•	•							
Environmental cost benefit analysis	For some individual budget measures		•	•	•	•	•	•			•	•		•	•
	For all individual budget measures														
Carbon assessment	For some individual budget measures	•		•	•	•	•				•	•		•	•
	For all individual budget measures							•							
	Whole budget				•						•	•			
Other tools	Biodiversity/Ecosystem service pricing														
	Carbon pricing instruments including fuel and carbon taxation, emissions trading systems		•	•	•	•	•		•	•	•	•	•	•	•
	Using a shadow price of carbon to evaluate public policies and investment				•	•	•			•		•		•	•
	Environmental tax reform				•		•				•	•	•	•	•
	Regular review of environmentally harmful tax expenditures and subsidies		•			•					•				•
	Inclusion of climate considerations in long-term fiscal sustainability analysis			•						•	•				•
	Green balance sheet														
	Environmental audit or validation of the budget													•	
	Green perspective in performance setting or performance budgeting					•	•								•
	Green perspective in spending review	•			•		•								•

Source: (OECD, forthcoming[94])

Despite its growing use, OECD countries still face a range of challenges when implementing green budgeting. The most common relate to the lack of methodologies to assess environmental effects, the absence of a modern multi-annual budgetary framework linked to strategic planning, shortfalls in political will to implement green budgeting, and time and staffing deficits, including lack of relevant knowledge and technical expertise (European Commission/IMF/OECD, 2021[91]). The OECD is working with Members on this topic through the **OECD Paris Collaborative on Green Budgeting**, a platform for countries to share best practices and to build resources on how green budgeting can inform public expenditure decisions (OECD, 2021[89]) (Box 4.9).

Box 4.9. OECD Paris Collaborative on Green Budgeting

The Paris Collaborative on Green Budgeting was launched by the OECD at the One Planet Summit in Paris on 12 December 2017. It aims to design new, innovative tools to assess and drive improvements in the alignment of national expenditure and revenue processes with climate and other environmental goals. This serves as a crucial step in achieving a central objective of the Paris Agreement on climate change as well as of the Aichi Biodiversity Targets and the United Nations' Sustainable Development Goals – aligning national policy frameworks and financial flows on a pathway towards low greenhouse gas emissions and environmentally sustainable development.

Source: (OECD, 2021[95])

Climate change involves environmental, biodiversity, and climate risks for countries, which, in turn, have budgetary and debt implications. Budget policy responses tend to increase government deficits and debts. For the medium-term budget framework to be credible, governments need to strengthen budget governance and to break down and manage these risks. Integrating disaster and climate risk in fiscal planning and budgeting frameworks in advance helps make countries more financially resilient (OECD/The World Bank, 2019[96]).

In the short term, environmental taxation creates new revenues for countries. This new income can then be used in several ways, such as to decrease other taxes, such as labour tax, or to extend compensatory budget measures for households. It also makes it possible to increase spending on investments in green sectors, innovations, or the financing of the Sustainable Development Goals (SDGs). In France, for example, such revenue was used to expand funding of renewable energies via a special allocation account.

The "greening" of medium-term frameworks provides an opportunity to integrate climate and environmental forecasts with macro-fiscal forecasts. The government's capacity to estimate the quantity and impact of climate-related spending over the medium term and then link these estimates with a baseline of sound macroeconomic and fiscal forecasts is crucial to green budgeting. However, with a few notable exceptions, many macro-fiscal forecasting models are not designed to account for the looming economic, budgetary, and financial costs resulting from climate change. Developing forecasting tools that capture the linkages among fiscal policy, the economy, and the environment may be prioritised as climate and environmental objectives gain prominence in the budget.

OECD countries are just starting to look at monitoring green accounting. Despite the multiplication of environmental and climate projects and actions implemented, some countries find it difficult to measure them in accounting terms and to estimate their value. General, analytical and budgetary accounting processes are complementary and help ensure the credibility of the budget and its execution. Although international accounting standards include methodologies for tracking environmental assets and liabilities (either through traditional accounting or the creation of new classes of accounts), few countries have specific green accounting systems in place.

Taking the environment into account in public financial information should help improve the budget and financial governance of countries. Moreover, the adaptation of accounting to environmental issues must also be done in tandem with more global accounting reforms such as accrual accounting. Green accounting could be a powerful tool for encouraging governments and administrations to take up green budgeting.

To ensure that the fiscal framework remains credible and reduces negative contingencies, governments need to analyse and manage the risks related to climate change and environmental degradation. Climate change and related policies affect public debt sustainability risks. As extreme weather events become more frequent and intense worldwide, their economic costs to both the public and private sectors are increasing. Governments have several ways to assess and manage these types of fiscal risks (OECD,

2021[89]). Medium-term budget analysis, macro-fiscal scenarios and stress tests can be useful tools. Long-term sustainability analysis that takes into account environmental and climate issues can help identify the governance reforms needed within the administration. The results of these analyses should inform and be integrated into countries' medium-term strategies and budget frameworks.

Rebooting regulatory policy for the green transition

Regulation is a crucial government lever for climate action and the green transition. Yet, to adapt to the evolving priorities of governments, regulatory policy needs to evolve, adjusting traditional regulatory management tools and using new approaches to achieve environmental goals.

Regulatory policy provides a set of powerful tools that, when applied at all stages of the regulatory policy cycle, should help governments put the economy and society on a carbon-neutral, resilient and sustainable path. These tools include good regulatory practices – such as regulatory impact assessment (RIA), stakeholder consultation and *ex post* evaluation of existing regulations – which need to be adapted to the challenges and the opportunities brought by transformative change and better focussed on climate goals. More recent practices, such as international regulatory co-operation (IRC), can improve the effectiveness of regulations that aim to tackle a cross-border challenge such as climate change (see Key Area 1). Finally, a greater emphasis on the benefits of regulations, better analysis of distributional effects and equality, and providing evidence to promote the values agreed on by society can all improve the use of regulatory policy for green goals.

RIA can help ensure policy coherence and the integration of environmental concerns in different policy areas. Embedding climate considerations at the *ex ante* impact assessment stage is crucial for the development of new legislation to help achieve climate goals. A range of issues need to be considered in these assessments, including the analysis of climate and other environmental impacts, the development of appropriate baselines (i.e. the costs of inaction), the sustainability and natural capital, ecosystems and biodiversity protection, health valuation and the social cost of carbon. In addition, the assessment of distributional impacts – i.e. identifying which communities or geographical areas will bear the costs or enjoy the benefits of a regulation – is growing in importance in light of the climate crisis. In recent years, OECD member countries and the European Union have required greater consideration of potential environmental impacts when designing rules (see Key Indicators - Figure 4.2, Panel C). In general, policy makers have been provided with methodological information about *how* and *what* to include when assessing potential environmental impacts. Engaging all relevant stakeholders through public consultation can help ensure that regulations are appropriate, effective and efficient. It will also contribute to better acceptance of and compliance with sometimes painful regulatory measures among all stakeholders. A number of environmentally related policy proposals have been improved as a result of RIA (Box 4.10), and some countries are making progress in using this tool to identify potential gender-specific effects of environmental policies (OECD, 2021[66]) (Box 4.11).

Governments also need to ensure that the innovation that can help solve the world's most pressing environmental and social challenges is not held back by regulations designed for the past. Agile, flexible and better co-ordinated governance and regulatory practices are needed to unlock the potential of innovation while safeguarding interrelated societal goals such as environmental sustainability, health and safety, and social justice. The new *OECD Recommendation for Agile Regulatory Governance to Harness Innovation* provides guidance on this. It aims to help governments adjust regulatory management tools to ensure regulations are fit for the future; set the institutional foundations to enable co-operation and joined-up approaches within and across jurisdictions; develop governance frameworks to enable the development of agile and adaptive regulation; and ensure that regulatory enforcement meets new needs.

Risk-proportionate rules and processes are essential to facilitate the transition to low-carbon energy sources and reduce energy consumption. Regulations that promote energy efficiency and require lower emissions need to be properly enforced. Risk-averse and rigid regulations can block the deployment of

carbon-reducing technologies and infrastructure: it is essential to streamline technical rules and permit requirements so that they are effective at preventing and managing risks, but in the most agile and innovation-friendly way possible. This means imposing permitting requirements only when risks are sufficiently high to justify it, and ensuring that they are not more onerous than those applied to CO2-intensive technologies for a comparable risk. It also means making processes as streamlined as possible and issuing clear and simple guidance to both frontline regulators and business operators. In addition, inadequate rules and delivery procedures (permits, certification, inspections and enforcement) can jeopardise the effectiveness of energy efficiency regulations (of vehicles, buildings, appliances), and this is also true of rules that seek to curb damaging environmental practices, for instance in extractive industries. Building outcomes-focused, flexible, data-driven, technology-enabled regulatory delivery systems is essential. This includes better detection of environmental problems through remote monitoring of emissions, reallocation of inspections and enforcement resources to the more "climate-damaging" risk areas, testing and certification requirements that are based on "real life" scenarios, and better market surveillance to ensure third-party certification remains trustworthy.

Systematically conducting *ex post* implementation evaluation and review is key to ensuring that the existing stock of legislation is in line with nationally and globally agreed climate and environmental goals. The stock of laws and regulations has grown rapidly in most countries. However, not all regulations will have been rigorously assessed *ex ante*, and even where they have, not all effects can be known in advance. Regulations should be periodically reviewed, both to acknowledge that the original environment justifying the regulation may have changed and to see how regulations have actually worked in practice. Evaluations of existing regulations can also produce important lessons on how to improve the design and administration of new regulations (OECD, 2020[97]).

Box 4.10. How RIA has helped improve environmentally related regulatory proposals

The **New Zealand** Government proposed a Healthy Waterways policy package aimed at restoring and protecting the health of the country's waterways by strengthening *Te Mana* o *Te Wai* as the framework for freshwater management;[1] improving the health of the ecosystem; strengthening the protection of wetlands and estuaries; protecting sources of drinking water; improving water and farm management practices; controlling high-risk farming activities and limiting agricultural intensification. The proposed policies changed significantly in light of the consultation comments on the interim RIA, recommendations from the Independent Advisory Panel, and in response to the new implementation challenges of COVID-19 pandemic. The updated proposal sought to protect freshwater bodies through more environmentally conservative objectives and limits in plans, halt further degradation of freshwater bodies, and increase restoration efforts where communities and regional councils identified that water would not be able to sustain current demands.

The Ministry of the Environment in **Denmark** amended the Environmental Protection Act by an executive order on waste management. The implementing regulation on waste management was initially drafted in a way that imposed DKK 24 M in administrative burdens on businesses. Based on the results of an RIA on administrative burdens for businesses, the regulation was rewritten to put the burden on fewer businesses, thereby lowering the burden to less than DKK 4 M.

1. Te Mana o te Wai relates to the essential value of water as a precious resource. This concept highlights the importance of sustaining the integrity and health of the water before providing for human use, through a three-tiered hierarchy of obligations: firstly, the obligation is to the water itself, to protect its health and its mauri; secondly, the obligation is providing for essential human needs, such as drinking water; thirdly, for other uses.

Source: Indicators of Regulatory Policy and Governance survey 2021, http://www.gazette.gc.ca/rp-pr/p1/2017/2017-05-27/html/reg1-eng.php, https://www.mfe.govt.nz/action-for-healthy-waterways, https://www.retsinformation.dk/eli/lta/2019/224

Box 4.11. Germany's climate gender impact assessment tool

RIAs which include a gender perspective have the potential to allow law makers to assess gender-effects of climate policies and help to ensure that gender equality goals are considered in the development and implementation of climate policies.

The German Environment Agency developed a climate gender impact assessment tool that follows the common two-step methodology of impact assessments (relevance test and main assessment), but builds upon six gender-related dimensions that reflect diverse areas of life where gender inequality is (re)produced, such as care work, labour economy and public resources.

Rooted in "empirical findings from gender-reflective research on climate change", the gender dimensions help identify and analyse gender-unequal effects in climate policies. The tool also incorporates an intersectional approach to take into account the interplay between gender or sex and other factors of inequality and marginalisation.

Source: (Sauer, 2018[98]; OECD, 2021[66])

4.4.2. Enablers for decision making

The public sector makes decisions that affect climate objectives on a regular basis at many different levels, from laws adopted by parliaments and long-term strategies announced by governments to decisions for new bicycle lanes or tendering for school meals in individual municipalities. Controlling or even tracking all of these is not realistic, but governments set the overall objectives and incentives to move in the desired direction.

Planning and decision making

Medium-term policy planning can help align short-term and long-term priorities and ensure that future environmental developments and targets shape present-day actions. OECD countries have different approaches to medium-term policy planning, often including many sector-specific strategies driven by the objectives and interests of individual policy areas, such as transport, education or energy. Few governments have cross-cutting strategies on competitiveness or sustainable development for varying timeframes. Only in recent years have climate objectives become prominent in such planning documents and countries put in place procedures that allow for a dedicated climate check on new policy plans. Austria, for instance, has developed a Strategy 2050, through which "legal projects at the federal and provincial level are to be subject to a mandatory climate review in order to prevent undesired adverse effects on the climate". While there is no "one-size-fits-all" approach to strategic planning, several strategies can be useful to consider and embed as part of a government's overall governing approach. Strategic planning needs to be complemented by other practices to ensure an effective decision-making process during the design and implementation phase.

Governments' climate and environmental strategic objectives can inform budgetary and fiscal planning. For instance, as a first step for credible green budgeting, a country should set out its national plans and strategies relating to climate change and the environment. These can help orient fiscal planning, guide public policy development, investment and other decisions on revenue and expenditure to support of green priorities (see section on Moving decisively to "green budgeting").

Longer-term perspectives need to guide medium-term planning and short-term policy development. For instance, choices made on infrastructure systems and public expenditures in the next decade will be critical for achieving global and national climate goals such as net zero carbon emissions or halting the dramatic

loss in biodiversity. Around 70% of GHG emissions are due to existing infrastructure such as power plants, buildings, and transport.

The magnitude and urgency of the climate change challenge require a more holistic and systemic public governance approach to medium-term planning. Incorporating *ex ante* climate impact assessments in strategic planning initiatives, or sustainability and resilience considerations in infrastructures planning and delivery, enables governments to better take into account climate change and exposure to shocks.

Mobilising the whole of government

Setting the overall direction and priorities, ensuring coherent decisions on trade-offs, and establishing co-ordinated and coherent approaches across sectors and multiple levels of government on a challenge that involves everyone is not straightforward. Indeed, effective cross-government co-ordination on climate change has been elusive to most governments for a number of years. Complex challenges such as climate change and the current COVID-19 pandemic are pushing governments to pull public institutions out of their silos to ensure a coherent and co-ordinated approach.

Existing governance processes and institutional arrangements in most countries are not ideally suited to address climate change. The issues governments need to manage have become more complex and transversal over time. Today, governments are increasingly organising the machinery of government to achieve climate-related objectives. Preliminary OECD evidence sheds light on the trends and patterns surrounding decision making to address climate change. It also provides an overview of the mechanisms in place to steer the overall strategy for climate change action; co-ordinate those actions horizontally across central institutions; and fulfil international commitments with respect to monitoring, reporting and verification (MRV) (OECD, forthcoming[31]). When it comes to co-ordination of climate action and climate policy, four broad types of institutional arrangements can be distinguished:

- A lead unit situated at the centre of government as the primary body tasked with co-ordination;
- Appointment of special advisors to co-ordinate climate action across government. For instance, Kenya's Climate Change Act 2016 appoints a senior official to co-ordinate the mainstreaming of climate change into sectoral strategies (Government of Kenya, 2016[99]);
- Permanent intergovernmental committees or commissions. For instance, in the United States a National Climate Task Force bringing together 21 public bodies facilitates the deployment of a "government-wide approach to combat the climate crisis" (Government of the United States, 2021[100]); and
- Climate "focal points" within line ministries and government agencies to address gaps in interagency co-ordination for climate change.

Government co-ordinating bodies – and those situated at the centre of government in particular – have a number of tools at their disposal to ensure both greater coherence across policy development and the mainstreaming of environmental issues in sectoral policies:

- They can lead the development and monitoring of overarching national strategies and plans to meeting climate and environment commitments, as outlined in Key Area 2 section on Strategic Planning.
- They can facilitate dialogue among key stakeholders, for instance by organising cross-government policy co-ordination groups or committees at the ministerial, state secretary or director level (OECD, 2018[101]). For instance, the National Climate Change Secretariat in Singapore established within the Prime Minister's Office (PMO) to develop and implement Singapore's climate change policies also acts as the secretariat for the Interministerial Committee on Climate change.[7] Likewise, in France, the *Secrétariat Général du Gouvernement* within the PMO supports the organisation and preparation of the Conseil de Défense Écologique (Ecological Defence Council) chaired by the President and bringing together relevant ministries and public bodies involved in the green transition.[8]

- They can provide a clear framework for the *ex ante* evaluation of climate-related bills. In France, the *Haut Conseil pour le Climat* recommended a series of steps prior to a bill's presentation to parliament: first, a public consultation of stakeholders to determine whether the bill requires further assessment; second, a detailed impact study relating to the low-carbon national strategy (*stratégie nationale bas-carbone*) when provisions may have a significant impact on climate objectives; and, third, an opinion on the quality of this study, issued by an independent authority.
- They can host a suitable knowledge management infrastructure to level the playing field across sectors and provide a common source of evidence. In Germany, for example, the Advisory Council on Global Change provides guidance to decision makers (despite existing uncertainties), assessing risks, identifying precautionary options and raising awareness to push for action.

Policy makers and regulators should also proactively consider how to strategically increase interactions among public sector institutions in order to co-ordinate and harmonise climate-relevant actions across sectors and borders. Some policy makers and economic regulators have already identified synergies among sectors that can be captured through sector coupling, as well as co-benefits to decarbonisation that extend beyond the sector in question (such as the improvement in air quality that accompanies climate mitigation efforts). Some regulators have also looked beyond national borders to benefit from cross-border co-operation. This is the case in Europe, for example, through the Body of European Regulators for Electronic Communications (BEREC) working groups focusing on promoting sustainability among European e-communications regulators. Further examples of this kind of cross-sectoral co-ordination and collaboration may be helpful in further strengthening such practices.

Tackling climate change also requires local actions and policies that align with national and global objectives and policy frameworks (OECD, 2021[102]). Subnational governments have responsibilities in several areas that have an impact on economic development and are relevant for climate policy (Matsumoto et al., 2019[103]). In particular, subnational governments play an important role in the three pillars of climate mitigation action – energy, land use, urban policy. Indeed, these pillars lie at the heart of regional development. Subnational governments are responsible for sectors crucial for climate action, including buildings and parts of transportation, other local infrastructure and waste management. In 2019, subnational governments accounted for 63% of public climate-significant expenditure, and 69% of public climate-significant investment, in 33 OECD and EU countries, on average (OECD, 2022[104]). Many decisions taken by local authorities have effects on GHG emissions, including local regulation on transport, building construction mandates, spatial planning and economic policies. Local and regional governments also play an essential role in supporting the most vulnerable populations, as they understand local issues. They facilitate co-ordination between the national and local levels, as well as co-operation among local authorities. Furthermore, cities and regions can often be role models that can set examples in emission reduction, in that they can act as laboratories where climate actions are tested out before being scaled up on a national level. The OECD Principles on Urban Policies and its accompanying Implementation Toolkit includes the principle of environmental sustainability and seeks to support national and subnational governments in making cities fit to face current and future climate shocks (OECD, 2022[105]).

The net zero transition requires integrating subnational governments into climate policy governance and addressing co-ordinating and financing challenges to achieve this. Meeting net zero targets requires an integrated approach that promotes horizontal and vertical policy co-ordination (OECD, 2021[102]). Countries are taking steps in this direction, for instance, setting up platforms to co-ordinate national, regional and local transport and land development policies to achieve climate-neutral transport, and to enable knowledge-sharing among different levels of government. While subnational governments already have some green budgeting tools at their disposal to prioritise their low-carbon investments, additional financial resources are needed to allow subnational governments to effectively redirect expenditure towards climate-neutral assets and scale up investment. The 2014 *OECD Recommendation on Effective Public Investment Across Levels of Government* sets out principles to help governments assess the strengths

and weaknesses of their public investment capacity and set priorities for improvement, including on climate and environmental goals.

Given the scale of the challenge, greater analysis of how more effective cross-government co-ordination for climate change can be delivered may be required.

Enabling institutions to promote environmental action and mainstreaming "green ethos" in the public service

Network regulators – in areas such as energy, transport, water and e-communications – are central to countries' efforts to reduce emissions. Ensuring that these institutions have the right mandates, funding, tools and governance arrangements will be critical to the achievement of environmental goals. More broadly, the public sector also needs to ensure that its workforce is appropriately equipped to address the climate challenge.

Economic regulators of network sectors affect a vast swath of the world's population – virtually everyone uses services regulated by economic regulators. Network sectors also tend to be highly resource intensive. Economic regulation is one lever for promoting the greening of these sectors, within the policy framework governing economic regulators. This means ensuring these regulators have the right legal framework (remit, mandate, powers and levers). There are a number of challenges in this area that governments could seek to address:

- **Mandate** – The traditional mandate of many economic regulators includes ensuring markets run efficiently, ensuring consumers have access to good-quality services, upholding competition and creating a level playing field for market actors. However, many regulators lack a sustainability mandate, adequate frameworks to encourage innovation, or other aspects of the policy framework that would enable them to address climate change. For example, a 2020 analysis of the efforts of regulators (including economic regulators) to anticipate and react to emerging technologies noted that regulators' mandates and functions were often misaligned with the demands of regulating innovation (OECD, 2020[106]). Consideration of such mandates should also apply to regulators not traditionally associated with climate efforts, such as e-communications – emissions are not just an "energy problem".
- **Investment** – Economic regulators carry out a range of functions that influence investment (OECD, 2017[107]), including setting rules and incentives to finance infrastructure investment in line with climate goals. However, the regulatory framework does not always allow regulators to take account of externalities such as emissions when making decisions on infrastructure. At the same time, it is important that the regulatory framework continues to encourage efficiency and distribute costs fairly. For example, the electricity and gas regulator in the United Kingdom, Ofgem, makes special funding available for investments that support the UK's net zero target (Université Paris Dauphine-PSL, 2021[108]). Similarly, the Water Industry Commission for Scotland maintains a separate pool of finance for investments that are higher in cost but also higher in value on a lifecycle basis, taking into account externalities such as emissions (WICS, 2020[109]) (Box 4.12). The OECD Recommendation on the Governance of Infrastructure recognises the need to "promote a coherent, predictable and efficient regulatory framework" as a prerequisite for delivering quality and sustainable infrastructure (OECD, 2020[74]).
- **Tariffs –** Tariff setting is a tool available to many economic regulators. When considering how to regulate tariffs, regulators take into account a range of considerations, which may include social and environmental objectives. Principles of intergenerational equity suggest that current and future customers should shoulder a "fair share" of long-term investment needs. Where tariffs fund infrastructure investment, this raises questions about the design of price regulation. "Optimising" investment may involve investing in more expensive infrastructure today to benefit the customers of tomorrow – and adjusting tariffs accordingly – while still incentivising capital efficiency. In the

Scottish water sector, where tariffs in large part fund infrastructure investment in the sector, this issue was central during the regulator's last pricing review (Box 4.12).

- **Innovation** – The regulatory framework for economic regulators should encourage innovative technology and business models that can support policy goals such as reducing emissions. Some regulators have already enabled experimentation by supporting or implementing trials, regulatory "sandboxes", pilot projects, and pilot regulations. For example, Ofgem has allocated special funding for trials on hydrogen gas networks in line with emission reduction goals (Université Paris Dauphine-PSL, 2021[108]).
- **Targeting operators and consumer behaviour** – Economic regulators can also be empowered to set targets or requirements for businesses to assess and act upon sustainability or resilience, including through licensing, codes and standards. For example, the Brazilian electricity regulator requires an annual social and environmental responsibility report from concessionaires, permit holders and authorisation holders operating in generation, transmission and distribution (OECD, 2021[110]). In addition, economic regulators may play a role in incentivising consumer behaviour in line with policy goals. The Colombian communications regulator, for example, now requires providers to make information available to consumers on their past consumption (OECD, 2017[111]), a behavioural intervention that is commonly included in the suite of actions in the energy sector to optimise energy consumption (IEA, 2021[112]).

Box 4.12. Strategic Review of Charges 21-27 by the Water Industry Commission of Scotland (WICS), United Kingdom

The Water Industry Commission for Scotland (WICS) engages in a price-setting process every six years within overarching principles and objectives set by the Scottish government. The Strategic Review of Charges for 2021-27 (SRC21) began in 2017 and sought to base SRC21 on a transparent and collaborative price review, taking into account the long-term challenges faced by the industry with respect to the need to transition to net zero emissions by 2040 and replace ageing infrastructure in a financially sustainable way. The final determination set the maximum charges allowing the state-owned service provider to deliver sufficient investment to meet several of these goals while maintaining expectations for service levels. SRC21 introduced a new regulatory framework designed to address these challenges, promoting open dialogue and seeking to establish an evidence base that underpinned the requirements. The previous focus on establishing a hard budget constraint as a way of ensuring efficient resource use over a defined regulatory period – while effective in the shorter term – had not created sufficient focus on the asset needs over the long term, including issues of intergenerational equity, and investment decision making on the basis of lowest immediate cash use.

SRC21 resulted in shifts to the regulatory framework that encourage a long-term perspective and allows for rolling investment decisions based on evidence-based priorities and value . Including a long-term strategic plan, the new regulatory framework represents a shift away from the previous rigid approach, which entailed the company and regulators agreeing *ex ante* on a list of necessary investment requirements. The new process supports decision making based on highest priority and highest value, rather than setting defined outputs and then seeking to deliver these at lowest short-term cost.

As part of the new regulatory framework for SRC21, the regulator worked jointly with water industry stakeholders throughout the process to ensure joint ownership of the approach, which focused on establishing the best outcomes for customers, communities and the environment.

Source: WICS (2020[109]), 2021-27 Final Determination Strategic Review of Charges, Water Industry Commission for Scotland, https://wics.scot/system/files/publications/2021-27%20Final%20Determination.pdf (accessed on 28 September 2021)

More broadly, designing and implementing policies for government to lead and facilitate climate action will call upon the collective ideas and co-ordinated efforts of a skilled, knowledgeable and resilient public service workforce. The ambitious carbon-neutral targets of OECD countries require employees with a range of skills and competencies, working with leaders who set systematic goals and instil enabling attitudes, all within a system that fosters and encourages action and innovation.

Putting policies in place that have a direct impact on climate goals is one important way that the public service contributes to the green transition. The "value chain" of researching, designing and implementing sustainability policy requires a complex range of skills, competencies and expertise, such as subject-matter knowledge, data collection and analysis, communications and collaboration with outside groups, and change management. Building a green public service will require combining skillsets in new ways. For example, budgeting experts may need to develop literacy in environmental impact assessment, clerks will likely need digital skills to go paperless or work remotely, and procurement officers may strengthen their capacities to choose suppliers based not only on quality, reliability and price, but also on their sustainability practices.

Another, perhaps equally important, set of competencies to build into the public service revolves around awareness and consideration of the environmental impacts of all government policies and actions, not just those that target green initiatives. Mainstreaming "systematic thinking" and "transformative literacy" (Jacob et al., 2021[113]) into all levels of the organisation is a long-term but highly effective strategy for tackling such broad challenges. If public employees consider themselves to be environmental stewards, they will consider the climate repercussions of not only their own actions, but of every policy and programme they help implement and of the organisations they are a part of.

Needed skillsets may be developed inside public service career paths, but many may also be found in job candidates outside of the public sector – especially for needs having to do with scientific or technical specialisation. This places a renewed onus not only on skill development and training, but on recruitment and partnership methods. Gaps or deficits in specialised knowledge can limit intuitive decision making based on expertise (Hanif, Ahsan and Wise, 2020[114]); there is thus a need to meaningfully incorporate subject experts into the public service in both policy and leadership roles. Governments may need to draw on new recruitment sources and hire at different levels of seniority along career paths, to ensure that the public service has the necessary green capacity. They may also consider creating opportunities in the public service for collaborative partnerships with outside experts. Whether through recruitment and in-house specialisation, or partnerships and outsourcing, it is essential that governments find ways to access necessary expertise.

Leadership at the organisational and team level is also critical for achieving sustainability and green thinking at the organisational and employee level. "Green leaders" can demonstrate the prioritisation of climate policy, set concrete environmental objectives and expectations, build organisational capacity inside the workforce and encourage widespread adoption of sustainable practices and thinking. They can also involve and collaborate with outside stakeholders and communities. "Mapping the system" to identify ways to co-operate with other relevant bodies is an especially important leadership capability in this regard (Gerson, 2020[115]). The senior level public service is therefore an essential player in the green transition, successfully implementing climate policies and playing a key role not only in policy design, but also in planning and organising collective extra-governmental efforts. Public service leaders can also guide their departments through periods of change, and create training and development systems that maintain the skills of the workforce as well as reward the type of innovative thinking required to solve complex climate issues.

There are several areas of action for governments to consider in creating a more green public service:

- In order to embed sustainability as a core competency for all public servants in policy and service design roles, **environmental assessments** can be built into the approval process for every new policy or programme (even those that are not directly related to sustainability).
- Conduct **green skills analysis** to identify existing gaps as well as skills that will be needed in the future. Put in place training, development and recruitment programmes to address these needs.
- Consider leadership through a sustainability lens. **Green leadership** is an essential component of building environmental stewardship into an organisation.
- Take action where possible to implement **new ways of working** that reduce the footprint of the public service itself. Flexibility to telework and conducting more long-distance meetings virtually reduces the use of resources and the need to commute.

Systematising innovative governance approaches

Mission-oriented innovation has become one of the most significant vehicles for tackling the "wicked" challenges facing governments today, including achieving ambitious climate goals in the coming decades. Mission-oriented innovation tackles complex challenges such as the global green transition by taking a purpose-oriented, market-shaping approach: the public sector takes an active role in convening and co-ordinating actors and resources around the complex, cross-sectoral, and cross-national issues that cannot be solved by individual actors alone. These measures may span different stages of the innovation cycle, from research to market deployment, mix supply and demand instruments, and cut across various policy fields, sectors and disciplines" (Larrue, 2021[116]). While there are examples of mission-oriented innovation in fields as varied as health and digitalisation, it is gaining particular traction as an approach for addressing climate change challenges. The European Commission has adopted the mission-oriented innovation framework, with four of the five declared mission areas connected to climate-related issues (namely: Adaptation to Climate Change including Societal Transformation; Healthy Oceans, Seas, Coastal and inland Waters; Climate-Neutral and Smart Cities; Soil health and Food). The Innovation Fund Denmark has launched a funding call for mission-driven green research and innovation to co-ordinate and govern the diversity of policy measures, partnerships, and solutions required to tackle climate change issues.

One approach of growing interest in support of climate policy is the adoption of more forward-looking governance mechanisms. Governments need to be constantly perceiving, understanding, and acting upon the future as it emerges in the present; this practice is known as **strategic foresight** (Tõnurist and Hanson, 2020[117]; OPSI, 2021[118]). This can enable discussions in public sectors about how to make alternative "greener" futures actionable today. It helps governments make more robust decisions by considering a range of developments, keeping an eye on signals of change, and improving their awareness and understanding of the future. By doing so, governments can build in contingency and preparedness planning across environmental systems and improve its overall resilience to unexpected developments. Integrating these broader and more systemic perspectives into strategic planning and decision making is referred to as anticipatory governance, and it can allow for more effective policy planning without creating rigidity and path dependency (Box 4.13).

Box 4.13. Examples of anticipatory governance approaches to inform climate and environmental policies

Governments worldwide are using foresight and anticipatory approaches to inform discussion and development of policies in response to numerous issues, including climate change and biodiversity loss.

Through its new function in inter-institutional relations and foresight, the European Commission is building awareness of the significance of environmental megatrends in every domain of public governance. Uses of strategic foresight in environmental policy are underway in the European Environment Agency, Germany (Federal Ministry for the Environment) Ireland (Department of the Environment, Climate and Communications), the Netherlands (Environmental Assessment Agency), and the UK (Department for Environment, Food, and Rural Affairs), among others. Yet, an important impact gap remains between foresight and action. Too often, the outcomes of foresight work are too intangible, indirect or separated from decision making to have an impact. As part of its Horizontal Project on Climate and Economic Resilience, the OECD is developing a toolkit to support countries in developing more future-ready net-zero transition plans. OECD's work on anticipatory governance is working to close this gap by considering the structures and processes that need to shift across governance functions in order to embrace anticipation and foresight. For example, through pioneering approaches in anticipatory prototyping in the public sector in Slovenia, the OECD is catalysing the development of concrete initiatives (OPSI, 2021[119]).

The use of **behavioural insights** (BI) can also help governments ensure the effectiveness of green policies through "human-oriented" approaches that consider behavioural barriers and biases in all the stages of policy making. To meet the climate change challenge, governments should encourage the adoption of more sustainable behaviours among individuals, communities, corporations and policy makers themselves. Some of the most successful BI interventions changed contexts to encourage green routines [see OECD (2017[120]); (2017[121]) and (2019[122])]. BI can help policy makers take a behaviourally informed approach to promoting sustainable and green policies (Box 4.14).

Box 4.14. Using behavioural insights to better design and implement green policies

BI can be used together with traditional policy-making tools to improve outcomes for all types of policies seeking to promote green outcomes by:

- taking into account how people are likely to respond to specific policy measures and green reforms;
- providing a more comprehensive evidence base for green policy proposals;
- using BI models when assessing the impact of green policy; and
- anticipating implementation and evaluation issues of green reforms.

There is scope for enhancing reliance on BI to make green policies more effective and efficient. For this, policy makers could:

- Consider behaviours early in the policy process while policies are being designed, laws and regulations are being drafted, and stakeholders are being consulted. Taking BI into consideration in policy and programme design means, for example, considering how timing, presentation, labelling and incentives – financial or non-financial – affect the success of policy measures.

- Incorporate behaviourally informed policy solutions that go beyond simple "nudges" to encourage sustainable outcomes. This includes encouraging compliance through regulatory delivery and improving the evaluation of past policy decisions by including an evaluation of potential undiagnosed or unintended behavioural barriers and biases in *ex post* reviews.
- Deploy BI strategically to improve the acceptability of green reforms. Behavioural economics shows that we tend to prefer immediate rewards over future gains. The time lapse between the benefits of environmental policies (e.g. reduced CO2 emissions) and more immediate behaviours (e.g. reducing meat consumption) leads us to what is known as temporal discounting. Understanding these psychological underpinnings can help policy makers better evaluate the extent to which citizens will accept, engage with, and comply with green reforms. Canada provides a good example of how governments can use BI experimentation to promote the acceptability and uptake of green policies (Box 4.15).
- Apply lessons learned from BI to policy makers. Government is created and run by humans who can experience the same barriers and biases as individuals in society, including availability bias, friction costs, present bias, scarcity, risk aversion and action-intention gaps. The OECD has begun mapping the possible behavioural challenges faced by regulatory policy makers from a regulatory governance perspective, which includes an evaluation of challenges and opportunities for the institutions, processes and tools used to make regulatory policy decisions (see (Drummond, Shephard and Trnka, 2021[123])).

Box 4.15. Behavioural insights and citizens' engagement with green policies – the experience from Canada's PARCA Survey

BI experimentation is enabling governments to broaden policy makers' knowledge of citizens' acceptance and engagement with green policies, equip decision makers to evaluate and assess the effectiveness of active or proposed green policies, and provide empirical evidence to better anticipate and prepare for future challenges surrounding climate change.

Recognising the impact that BI has in contributing to policy design and implementation, the Canadian Privy Council's Impact and Innovation Unit (IIU) launched a longitudinal survey that uses BI to measure and promote acceptability and uptake in climate action and green policies among Canadians.

The survey draws insights from a nationally representative sample of Canadians to test:

- Canadians' knowledge, attidudes, and perception of climate change;
- Canadians' self-reported intentions and willingness to enage in green or environmentally sustainable behaviours;
- Predictors for support of green or sustainable policies; and
- Behavioural segmentation towards climate change within the population.

The survey is part of the Program of Applied Research on Climate Change in Canada (PARCA Canada) and carried out in partnership with Environment and Climate Change Canada (ECCC) and Natural Resources Canada (NRCan).

The results of will contribute knowledge on the behavioural barriers and enablers that affect green action and policies targeting climate change.

Source: Program of Applied Research on Climate Action in Canada (PARCA) | Impact Canada

Risk governance: building capacities to anticipate and prioritise climate-related risks and co-ordinate whole-of-society preparedness

The impacts of climate change are already apparent in more frequent and intense weather-related disasters, and the risk of extreme events is set to increase. High temperatures and low precipitation were key factors behind extreme forest fire seasons across North America, Europe and Australia in 2019-2020. In Europe, the occurrence of forest fires is not only a risk in summer. In 2020, winter forest fires burned from the Pyrenees in France to the Danube Delta in Romania, and together, with spring fires, are increasing the total burnt area in Europe to above regional average in the previous decade (San-Miguel-Ayanz et al., 2021[124]). In 2021, severe floods affected Japan, Belgium, Luxembourg, the Netherlands and, in some cases resulting in a record number of lives lost and damages to critical infrastructure (Copernicus Emergency Management Service, 2021[125]; Government of Japan - Cabinet Office, 2022[126]).

Incorporating climate change into national risk assessments (NRA) can foster shared risk ownership across the whole of government and wider society. Most OECD countries have not integrated longer-term climate change risk assessments into their NRA (OECD, 2018[127]). The use of such risk governance tools is an opportunity to capitalise on the heightened awareness of critical risks that the COVID-19 pandemic has produced. The *OECD Recommendation on the Governance of Critical Risks* calls on countries to use national risk assessments to achieve a common understanding of risks and risk ownership across government ministries, local and regional authorities, and the wider society in the short, medium and longer term. Improved risk communication on longer-term climate change risk assessments can also help encourage communities and the private sector to invest in resilience measures, prepare for future shocks, and identify opportunities that changes in climate may provide.

The COVID-19 pandemic and other recent crises revealed gaps in preparedness for critical risks that can be addressed as part of a green recovery that builds a resilient society. The *OECD Recommendation on the Governance of Critical Risks* provides a standard for addressing important lessons from the COVID-19 experience, with well-developed plans, capabilities and flexible crisis management structures that can adapt and respond to the unexpected:

- Principle 2 of the Recommendation calls on countries to build preparedness through foresight-informed risk assessments to better anticipate complex and wide-ranging impacts. By improving their understanding of climate change-related risks as part of a holistic risk governance approach, governments will be able to drive positive change to mitigate emerging risks (both within and across national boundaries), as well as how to prioritise them vis-à-vis other critical risks. Assessing the cascading effects of climate change on other major risks to society will improve the understanding of the wide range of impacts governments should prepare for. An example of this is the most recent National Disaster Risk Assessment for Switzerland (Federal Office for Civil Protection FOCP, 2020[128]).
- Principle 3 of the Recommendation encourages Members to raise awareness of critical risks to mobilise households, businesses and international stakeholders and foster investment in risk prevention and mitigation. By framing the actions citizens and businesses can take to improve their own resilience, governments can encourage those activities that enhance society's resilience to climate-related risks while transitioning to a carbon neutral economy.
- Principle 3 also encourages Members to develop their strategic planning in a way that strengthens the mix of structural protection and non-structural measures to reduce risks. By working with line ministries responsible for critical infrastructure, sector regulators, and infrastructure operators on how to exploit the synergies between decarbonisation and resilience to extreme weather events, governments can boost the resilience of both communities and critical infrastructure networks. For example, the resilience of the electricity supply could be improved by supporting community-level microgeneration using renewables.

The COVID-19 recovery provides an important opportunity for governments to invest in resilience, develop national resilience strategies and better prepare for future climate-related disasters. The *OECD Recommendation on the Governance of Critical Risks* highlights the importance of transparency and accountability in risk-related decisions, recommending continuous learning from shock events and applying this experience to policy reform. As many governments undertake evaluations, audits or reviews of their risk management strategies following the COVID-19 pandemic, a priority for governments should be more explicitly integrating adaptation to climate change and into the wider resilience narrative. Using COVID-19 recovery funding to incentivise climate resilience is another opportunity that should not be missed. Initiatives such as *NextGenerationEU* of the European Union or the *Build Back Better Framework* of the United States provide examples of forward-looking policy that place resilience at the centre of a green recovery.

4.5. Key area 3: Leading by example – A greener and more resilient public sector

Governments should demonstrate organisational leadership on promoting green change, taking assertive measures that convey how green action and climate adaptation is a shared responsibility – and one where government can play a major role. The public sector is a significant actor in every national economy, leaving behind an environmental footprint that needs to be understood and reduced over time. This section discusses how the public sector can demonstrate action to respond to environmental pressures and transform itself to face environmental challenges.

Leading by example requires governments to incorporate environmental considerations in their organisational arrangements around public employment, public services, and public real estate and assets. This forces governments to explore how they can harness their power as employer to create greener work arrangements and their role as service provider to promote green government operations and expand markets for green goods and services. Environmental pressures also push governments to rethink their role in supporting greater sustainability through improved infrastructure resilience, innovative uses of technology and data, dematerialised services, and more sustainable service models. To effectively act on these issues, governments will need to have detailed information on the environmental impacts of their work across agencies, levels of government and types of operations.

Climate change and other environmental pressures also force a transformation of the way the public sector goes about their day-to-day operations and activities. For public administrations, this means ensuring a more resilient public workforce and public services that can secure continuity of operations throughout the changes brought about by climate and other environmental and non-environmental threats. It also focuses additional attention on public real estate and assets, in particular the type of operations and maintenance needed to ensure green performance and climate resiliency of infrastructure.

Governments can also lead by example by imposing responsible supply chain requirements on their suppliers and encouraging supply chains to implement RBC standards if they want to conduct business with the public sector (see Key Area 2 section on Leveraging the public sector's purchasing power: green procurement). As a major buyer of goods, the public sector is well placed to influence practices across international supply chains, by requiring suppliers to comply with RBC considerations and recommendations. In this context, countries are gradually developing responsible public procurement frameworks that account for environmental considerations, also including for global supply chains (see Key Indicators - Figure 4.2, Panel E) (OECD, forthcoming[86]).

Mindful of these considerations, some countries have already put in place whole-of-government strategies to make their operations greener and support the achievement of their domestic and international commitments on climate and environmental targets. For instance, Canada has put in place the Greening Government Strategy to support the governments' commitment for net zero emissions by 2050, including an interim target of a 40% emissions reduction by 2025 for federal facilities and conventional fleet

(Box 4.16). In the United States, the Federal Government is directed to align its management of federal procurement and real property with achieving a 100% clean energy economy by 2035 and net zero emissions no later than 2050 (Executive Office of the President, 2021[129]).

Box 4.16. Canada's Greening Government Strategy

Canada's "Greening Government Strategy" calls on government to reduce greenhouse gas (GHG) emissions to the atmosphere, and increase the resilience of government assets, services and operations by adapting to the changing climate. The Canadian government plans to transition to net-zero carbon and climate-resilient operations, while also reducing environmental impacts beyond carbon, including on waste, water and biodiversity. The Centre for Greening Government (of the Treasury Board of Canada Secretariat) provides leadership toward net-zero, climate-resilient and green government operations.

To bring about these objectives, the Canadian government has committed to act on the following areas:

- **Mobility and fleets:** Adopting low-carbon mobility solutions, deploying supporting infrastructure in its facilities and modernising its fleets. For example, the government will facilitate opportunities for flexible work arrangements by enabling remote computing telecommunications and by supporting IT solutions.
- **Real property:** Maintaining a net-zero climate-resilient real property portfolio plan to determine the most cost-effective pathway to achieve net-zero, climate-resilient real property operations by 2050 (i.e. sharing facilities; maximising energy efficiency, and switching to lower carbon fuels, etc.). In addition, government will reduce its water consumption and its load on municipal systems, and reduce the environmental impact of waste. Finally, it will manage its property holdings to retain and restore biodiversity, mitigate and adapt to climate change by maintaining and restoring wild or near-wild areas that conserve healthy populations of native species.
- **Climate-resilient services and operations:** Minimising disruptions and damage to its assets, services and operations related to the impacts of climate change. Canada is set to increase training and support for public service employees on assessing climate change impacts, undertaking climate change risk assessments, and developing adaptation actions, and facilitating sharing of best practices and lessons learned.
- **Procurement of goods and services:** Supporting the transition to a net-zero, circular economy through green procurement that includes lifecycle assessment principles and the adoption of clean technologies alongside green products and services.
- **Policies:** Aligning relevant government operations policies to further incorporate greening and climate resilience, and including greening priorities into the responsibilities of senior officials who will ensure that climate issues are addressed comprehensively in planning and operations.

Oversight and performance measurement tools are in place to ensure accountability for the government's environmental performance following the principles of transparency and open data.

Source: https://www.canada.ca/en/treasury-board-secretariat/services/innovation/greening-government/strategy.html

Being the largest employer (and spender) in many OECD countries, "greening" public sector work practices can make an impact towards environmental goals and steer individual behaviours for green action. The public service can lead by example in implementing climate-friendly work arrangements and systems. A more permanent shift to teleworking, for example, can reduce emissions from commuting and travel, including to geographically centralised government hubs in capital cities with large emission footprints. As discussed earlier in this chapter, the same applies for equipment needs, including office furniture, supplies

and IT tools to perform public service mission see Key Area 2 section on Leveraging the public sector's purchasing power: green procurement). Digital service delivery can have a similar effect, enabling citizens to access public services or be involved in government programmes without the need for travel or for using paper.

At the same time, the potential of climate change and other environmental threats to affect and disrupt government services and operations requires strengthening the resilience of the public sector workforce. Lessons from governments' management of public servants in response to the COVID-19 pandemic can help identify opportunities for handling and harnessing change toward a more sustainable public workforce (OECD, 2020[130]).

One additional way governments may lead by example is by acknowledging and integrating the gender-environment nexus into environmental action. This can involve making an effort to increase gender balance among staff in decision-making bodies in the public sector, helping bring to the forefront diverse experiences with the environment, and potentially advancing positive environmental outcomes. For example, evidence has shown that the presence of women in political decision making translates into more ambitious climate goals and policies (OECD, 2022[131]; Mavisakalyan and Tarverdi, 2019[132]). Similarly, a study examining European Parliament legislators found that while male and female legislators conveyed similar concern for environmental issues, female legislators were significantly more likely to support environmental legislation, even after controlling for nationality and political ideology (Ramstetter and Habersack, 2019[133]).

4.5.1. Designing greener public services in the digital age

As governments rethink the design and delivery of public services in the digital age, they should consider environmental impacts and wider climate implications. OECD member countries increasingly recognise the use of digital technologies and data to fully transform citizens' experience with public services, rather than simply transferring analogue information and processes online (OECD, 2014[134]; OECD, 2020[135]).

Governments should balance the benefits of their digital transformation for citizens and businesses with preserving the environment by investing in sustainable and greener digital infrastructure. This requires a proper understanding of the environmental implications of public service design and delivery in the digital age**,** carefully looking at the types of digital technologies and the use of common infrastructure across government (e.g. data centres vs cloud services, computers and electronic devices), key technical specifications that may have an impact on countries' environmental footprint (e.g. electricity consumption, electronic waste, and manufacturing materials) as well as IT lifecycles. For example, with the growing attention and use of blockchain, governments should carefully assess the environmental footprint of such technologies against their promised benefits, and look at possible alternative solutions that do not compromise ongoing environmental policies (Lindman et al., 2020[136]). Governments should also be mindful of rebound effects in their digitalisation efforts, where the potential improvements in resource efficiency can, in some cases, paradoxically lead to an overall net increase in resource use.

Governments have already started to pay attention to the impact of digital and data public infrastructure on the environment, however, these efforts need to be mainstreamed and scaled up. The OECD Good Practice Principles for Data Ethics in the Public Sector stress how "governments should take action to address the potential environmental impact of digital and data infrastructure. This includes, for instance, reducing their carbon footprint (e.g. avoiding the proliferation of unnecessary, redundant or overlapping data infrastructure such as data centres) and investing in clean and renewable energy infrastructure" (OECD, 2021[137]). Also, the EU Berlin Declaration on Digital Government[9] includes a principle on digital sustainability and calls for concrete actions to mitigate the climate impact of digital government. Similarly, Canada's Greening Government Strategy (Box 4.16) includes promoting sustainable procurement, greening IT strategies, and initiatives for an eco-friendly digitalisation of the public sector. In France, a dedicated inter-ministerial mission (Ministry of Ecological Transition and the Inter-ministerial Directorate

for Digital Affairs, DINUM) are implementing the cross-government initiative Green Tech to foster an eco-friendly digital transformation of the public sector (Box 4.17).

OECD countries are increasingly focusing on understanding digital and data infrastructure from a green perspective. This requires adopting a strategic approach to governing digital infrastructure in line with broader environmental policies and establishing the governance mechanisms to align digital government and climate change actions. For this, further policy alignment and co-ordination between digital government and environmental authorities is needed to identify synergies and mobilise resources, as well as other policy areas with a significant impact in allocating resources and acquiring digital infrastructure, such as public budgeting and procurement organisations.

Under such a strategic approach and given the cost and lifespan of digital technologies, reducing digital government footprint requires planning, selecting and prioritising investments in eco-friendly digital technologies. From a public governance perspective, this entails incorporating environmental variables when planning digital government projects and establishing their value proposition (business cases) in order to prioritise sustainable digital infrastructure, promote circular economy and refurbished technology, as well as to reduce IT waste across the public sector.

There is also scope to improve how governments reflect on understanding the environmental implications of public service design and delivery in the digital age. For instance, governments could ensure that 'Service Standards', the principles against which the quality of public services is judged, include a green element. This is already the case for a number of public policy priorities (e.g. inclusiveness, openness, security, privacy and reliability); adding a green dimension to these quality standards would enable governments to identify where to focus their efforts for a greener digital transition.

Box 4.17. France's Green Tech Initiative

Acknowledging the growing impact of information and digital technologies on carbon emissions, in May 2020, France established the ***Green Tech*** initiative, which seeks to increase the awareness of and reduce the environmental footprint of digital technologies when delivering public sector operations and services. Created under the responsibility of the Inter-ministerial mission to reduce digital environmental impact, which includes the Ministry of Ecological Transition and the Inter-ministerial Directorate for Digital Affairs (DINUM), the initiative looks at achieving eco-responsible public services in the digital age through 20 actions to adapt government operations to the environmental needs of the future, as well as specific provisions on the environmental consequences of digital technologies in the public sector.

The initiative includes a strategic roadmap with specific goals and activities around three areas:

- **Develop awareness of the digital environmental footprint in the public sector**, including measurement frameworks and data collection;
- **Reduce the environmental footprint of digital technology in the public sector**, for example through responsible digital procurement, eco-design of digital services; and increased awareness, support, training in responsible digital actions and uses;
- **Use digital technology to help achieve ecological and solidarity goals**, promoting electrical and electronic equipment waste management and circular economy

Currently, *Green Tech* is piloting the environmental impact of initiatives within the TECH.GOUV Digital Strategy. Complementary resources are being developed to support its implementation, including:

- Framework and guidance to support eco-design of digital services
- Digital toolkit to help civil servants identify green consideration in digital government

- Practical guide to implement sustainable digital procurement
- Streamlining the MAREVA2 project evaluation method with a "responsible digital" component in progress).
- Dissemination and adaptation of the methodology for calculating the environmental footprint of digital technology (in progress)

Source: https://ecoresponsable.numerique.gouv.fr/

4.5.2. Keeping track of the environmental footprint of government operations

Governments are only starting to collect data about the environmental implications of their ecological footprint. Individual public agencies have targets for the use of energy, water, paper, etc., but the ability to track overall carbon emissions or other environmental hazards is not widely established. Publicly available data on key indicators, such as carbon emissions, to compare regional authorities, municipalities and government agencies (both with each other and over time) will help focus the attention of decision makers and the wider public. The greater use of cloud computing or technology could help public sector organisations combine resources, reduce duplication and better collaborate to tackle the cost and environmental impact of providing public services (for instance from energy consumption or electrical waste). This could include, for example, reusing back-end systems rather than buying or developing new ones, consolidating hosting through shared platform solutions to achieve economies of scale, or creating shared services to ensure an optimal use of public sector assets.

Delivering greener public services also entails checking that public services actually help achieve climate and environmental objectives. Performance indicators and incentives to do so include monitoring emissions or solid waste management (e.g. recycling), as well as other forms of pollution or environmental degradation relevant to national and international environmental commitments. Countries looking at reducing their environmental footprint need to measure and understand the impact of public sector operations on the environment from education to defence, and have incentives in place for greening public services across levels of government. Governments have well-established systems to produce the annual financial statements and financial reports; they may want to consider publishing annual reports and balance sheets that disclose environmental footprints of public sector operations.

4.6. Conclusions

The evidence examined in this chapter demonstrates that the futures of democratic governance and effective environmental action are intertwined. Democratic governments are increasingly expected to show that they are the best placed to handle environmental pressures, especially the existential climate threat, while the success of climate and environmental policies simultaneously depend on effective and efficient public governance. Greater efforts are needed in governments' capacities to steer and build consensus and trust on the green agenda, transform public governance tools for climate and environmental action, and lead by example through a greener and more resilient public sector. Building on existing good practices, an OECD Action Plan has been developed, with concrete actions countries can take to address the issues outlined in this chapter with reforms that are ambitious and impactful: www.oecd.org/governance/reinforcing-democracy/.

References

Andres, L. et al. (2016), "A Methodological Framework for Prioritising Infrastructure Investment", *Journal of Infrastructure Development*, Vol. 8/2, pp. 111-127. [26]

Averchenkova, A., S. Fankhauser and J. Finnegan (2018), "The role of independent bodies in climate governance: The UK's Committee on Climate Change", *Grantham Research Institute on Climat Change and the Environment, Centre for Climate Change Economics and Policy*, http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2018/10/The-role-of-independent-bodies-in-climate-governance-the-UKs-Committee-on-Climate-Change_Averchenkova-et-al.pdf. [32]

Blazey, A. and Lelong, M. (2022), "Green Budgeting: A way forward", *OECD Journal on Budgeting*, Vol. 22/2, https://doi.org/10.1787/dc7ac5a7-en. [90]

Brezzi, M. et al. (2021), "An updated OECD framework on drivers of trust in public institutions to meet current and future challenges", *OECD Working Papers on Public Governance*, No. 48, OECD Publishing, Paris, https://doi.org/10.1787/b6c5478c-en. [14]

Butler, C. et al. (2015), "Public values for energy futures: Framing, indeterminacy and policy making", *Energy Policy*, Vol. 87, pp. 665-672, https://doi.org/10.1016/J.ENPOL.2015.01.035. [19]

Copernicus Emergency Management Service (2021), *Widespread European flooding, July 2021*, Copernicus EMS - European Flood Awareness System, https://www.efas.eu/en/news/widespread-european-flooding-july-2021 (accessed on 8 February 2022). [125]

Council of Europe (2012), "OPINION (2012) NO. 15 on the specialisation of judges, by the consultative council of european judges", https://rm.coe.int/16807477d9. [64]

Department of Children and Youth Affairs Ireland (2020), *Minister Katherine Zappone opens Youth Climate Justice Fund*, https://www.gov.ie/en/news/bfe6bc-minister-katherine-zapponelaunches-. [38]

Drummond, J., D. Shephard and D. Trnka (2021), *Behavioural insights and regulatory governance: Opportunities and challenges*, OECD Publishing, Paris, https://doi.org/10.1787/ee46b4af-en. [123]

Dryzek, J., R. Norgaard and D. Schlosberg (eds.) (2011), *The Oxford Handbook of Climate Change and Society*, Oxford University Press, https://doi.org/10.1093/oxfordhb/9780199566600.001.0001. [54]

Eom, K., H. Kim and D. Sherman (2018), "Social class, control, and action: Socioeconomic status differences in antecedents of support for pro-environmental action", *Journal of Experimental Social Psychology*, Vol. 77, pp. 60-75, https://doi.org/10.1016/j.jesp.2018.03.009. [55]

European Commission (2021), "Commission Notice — Technical guidance on the climate proofing of infrastructure in the period 2021-2027", *Official Journal of the European Union* C 373, pp. 1-92, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021XC0916(03). [73]

European Commission (2021), *Commission Notice on Technical guidance on sustainability proofing for the InvestEU Fund*, European Commission, Brussels, https://europa.eu/investeu/investeu-fund/about-investeu-fund_en (accessed on 21 September 2021). [80]

European Commission/IMF/OECD (2021), *Green Budgeting: Towards Common Principles*, http://ec.europa.eu/info/sites/default/files/economy-finance/cop26_en.pdf. [91]

European Union (2021), *Climate Change, Special Eurobarometer*, https://doi.org/10.2834/437. [8]

Executive Office of the President (2021), *Executive Order 14008 Tackling the Climate Crisis at Home and Abroad*. [81]

Executive Office of the President (2021), *Executive Order 14008 Tackling the Climate Crisis at Home and Abroad*. [129]

Fairbrother, M. et al. (2021), "Governing for Future Generations: How Political Trust Shapes Attitudes Towards Climate and Debt Policies", *Frontiers in Political Science*, https://doi.org/10.3389/fpos.2021.656053. [13]

Federal Office for Civil Protection FOCP (2020), *National risk analysis report. Disasters and Emergencies in Switzerland 2020*, FOCP, Bern. [128]

Figueres, C. and T. Rivett-Carnac (2020), *The Future We Choose*, Manilla Press. [3]

G20 Infrastructure Working Group (forthcoming) (2021), *GIH Roadmap: Infrastructure's Transition to a Circular Economy (discussion draft)*. [71]

German Federal Constitutional Court (2021), , https://www.bundesverfassungsgericht.de/SharedDocs/Pressemitteilungen/EN/2021/bvg21-031.html. [63]

Gerson, D. (2020), "Leadership for a high performing civil service: Towards senior civil service systems in OECD countries", *OECD Working Papers on Public Governance*, No. 40, OECD Publishing, Paris, https://doi.org/10.1787/ed8235c8-en. [115]

Giddens, A. (2009), *The Politics of Climate Change*, Polity, Cambridge. [4]

Glass Lewis (2021), *2021 Proxy Season Review - Shareholder Proposals*, https://glasslewis.com/wpcontent/uploads/2021/09/Shareholder-Proposals-2021-Proxy-Season-Review.pdf. [47]

Government of Canada (2021), *Indigenous leadership and initiatives*, https://www.canada.ca/en/environment-climate-change/services/nature-legacy/indigenous-leadership-funding.html. [33]

Government of Canada (2018), *Policy on Green Procurement*, https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573&section=html (accessed on 24 June 2021). [85]

Government of Japan - Cabinet Office (2022), *Study group on evacuation based on a series of heavy rain disasters from July 3rd yeat Reiwa*, Cabinet Office, Tokyo, http://www.bousai.go.jp/fusuigai/r3hinanworking/pdf/hokoku_honbun.pdf (accessed on 8 February 2022). [126]

Government of Kenya (2016), *Climate Change Act*, http://www.environment.go.ke/wp-content/uploads/2018/08/The_Kenya_Climate_Change_Act_2016.pdf (accessed on 8 October 2021). [99]

Government of the United States (2021), *Executive Order on Tackling the Climate Crisis at Home and Abroad | The White House*, https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/ (accessed on 8 October 2021). [100]

Graham, N., S. Daub and B. Carroll (2017), "Mapping Political Influence. Political donations and lobbying by the fossil fuel industry in British Columbia", *Canadian Centre for Policy Altenatives*, https://www.policyalternatives.ca/sites/default/files/uploads/publications/BC%20Office/2017/03/ccpa-bc_mapping_influence_final.pdf. [45]

Guillén Bolaños, T., M. Manez Costa and U. Nehren (2016), *Development of a prioritization tool for climate change adaptation measures in the forestry sector: A Nicaraguan case study*, https://www.researchgate.net/publication/321228905_Development_of_a_prioritization_tool_for_climate_change_adaptation_measures_in_the_forestry_sector_A_Nicaraguan_case_study/citation/download (accessed on 29 September 2021). [22]

Haasnoot, M. et al. (2013), "Dynamic adaptive policy pathways: A method for crafting robust decisions for a deeply uncertain world", *Global Environmental Change*, Vol. 23/2, pp. 485-498, https://doi.org/10.1016/J.GLOENVCHA.2012.12.006. [18]

Hammar, H. and S. Jagers (2006), "Can trust in politicians explain individuals' support for climate policy? The case of CO2 tax", *Climate Policy*, Vol. 5/6, https://doi.org/10.1080/14693062.2006.9685582. [9]

Hanif, S., A. Ahsan and G. Wise (2020), "Icebergs of Expertise-Based Leadership: The Role of Expert Leaders in Public Administration", *Sustainability*, Vol. 12/11, p. 4544, https://doi.org/10.3390/su12114544. [114]

Harring, N. and S. Jagers (2013), "Should we trust in values? Explaining public support for pro-environmental taxes", *Sustainability (Switzerland)*, Vol. 5/1, https://doi.org/10.3390/su5010210. [10]

IEA (2021), *The Potential of Behavioural Interventions for Optimising Energy Use at Home*, International Energy Agency, Paris, https://www.iea.org/articles/the-potential-of-behavioural-interventions-for-optimising-energy-use-at-home. [112]

Influence Map (2019), *Big Oil's Real Agenda on Climate Change: How the oil majors have spent $1B since Paris on narrative capture and lobbying on climate*, https://influencemap.org/report/How-Big-Oil-Continues-to-Oppose-the-Paris-Agreement-38212275958aa21196dae3b76220bddc (accessed on 16 July 2019). [44]

InfluenceMap (2021), *2021 Shareholder Resolutions on Corporate Climate Policy Engagement*, https://influencemap.org/landing/Shareholder-Resolutions-773735dc958a2f2f2f44b972cc0c6e6613103#1. [46]

International Environmental Agreements Database (2021), "International Environmental Agreements Database Website", https://iea.uoregon.edu/. [61]

IPBES (2019), *Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*, IPBES Secretariat, Bonn, Germany. [2]

IPCC (2021), *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, IPCC. [1]

IPCC (2007), *AR4 Climate Change 2007: Impacts, Adaptation, and Vulnerability — IPCC*, https://www.ipcc.ch/report/ar4/wg2/ (accessed on 29 September 2021). [20]

IUCN (2019), *Recognising and supporting indigenous leadership in conservation*, https://www.iucn.org/news/commission-environmental-economic-and-social-policy/201908/recognising-and-supporting-indigenous-leadership-conservation. [34]

Jacob, K. et al. (2021), "Change from Within: Exploring Transformative Literacy in Public Administrations to Foster Sustainability Transitions", *Sustainability*, Vol. 13/9, p. 4698, https://doi.org/10.3390/su13094698. [113]

Jeudy-Hugo, S., L. Lo Re and C. Falduto (2021), "Understanding countries' net-zero emissions targets"*, OECD/IEA Climate Change Expert Group Papers*, No. 2021/03, OECD Publishing, Paris, https://doi.org/10.1787/8d25a20c-en. [16]

Jones, R. et al. (n.d.), "2 Foundations for Decision Making Coordinating Lead Authors: Lead Authors: Contributing Authors: Review Editors". [25]

Kauffmann, C. and C. Saffirio (2021), "Good regulatory practices and co-operation in trade agreements A historical perspective and stocktaking"*, OECD Regulatory Policy Working Papers*, No. 14, OECD, Paris. [67]

Larrue, P. (2021), "The design and implementation of mission-oriented innovation policies: A new systemic policy approach to address societal challenges"*, OECD Science, Technology and Industry Policy Papers*, No. 100, OECD Publishing, Paris, https://doi.org/10.1787/3f6c76a4-en. [116]

Lewandowsky, S. (2020), *Climate Change Disinformation and How to Combat It*, The Annual Review of Public Health, https://doi.org/10.1146/annurev-pulhealth-09419-102409. [58]

Lindman, J. et al. (2020), *The uncertain promise of blockchain for government*, OECD Publishing, Paris, https://doi.org/10.1787/d031cd67-en. [136]

Linz, J. (1998), "Democracy's Time Constraints", *International Political Science Review*, Vol. 19/1, https://doi.org/10.1177/019251298019001002. [5]

Matasick, C., C. Alfonsi and A. Bellantoni (2020), "Governance responses to disinformation : How open government principles can inform policy options"*, OECD Working Papers on Public Governance*, No. 39, OECD Publishing, Paris, https://doi.org/10.1787/d6237c85-en. [57]

Matsumoto, T. et al. (2019), "An integrated approach to the Paris climate Agreement: The role of regions and cities"*, OECD Regional Development Working Papers*, OECD, Paris. [103]

Mavisakalyan, A. and Y. Tarverdi (2019), "Gender and climate change: Do female parliamentarians make difference?", *European Journal of Political Economy*, Vol. 56, pp. 151-164, https://doi.org/10.1016/j.ejpoleco.2018.08.001. [132]

Noble, I. (2014), *Adaptation Needs and Options*, Cambridge University press, https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap14_FINAL.pdf (accessed on 29 September 2021). [21]

OECD (2022), *Aligning Regional and Local Budgets with Green Objectives: Subnational Green Budgeting Practices and Guidelines*, OECD Multi-level Governance Studies, OECD Publishing, Paris, https://doi.org/10.1787/93b4036f-en. [92]

OECD (2022), *Building Trust to Reinforce Democracy: Main Findings from the 2021 OECD Survey on Drivers of Trust in Public Institutions*, Building Trust in Public Institutions, OECD Publishing, Paris, https://doi.org/10.1787/b407f99c-en. [15]

OECD (2022), *Decarbonising Buildings in Cities and Regions*, OECD Urban Studies, OECD Publishing, Paris, https://doi.org/10.1787/a48ce566-en. [30]

OECD (2022), "Implementation toolkit of the OECD Principles on urban policy", *OECD Regional Development Papers*, No. 31, OECD Publishing, Paris, https://doi.org/10.1787/630e0341-en. [105]

OECD (2022), *OECD Survey on Drivers of Trust in Institutions: Main Findings Report*, OECD, Paris. [12]

OECD (2022), "Recommendation of the Council on International Regulatory Co-operation to Tackle Global Challenges", *OECD Legal Instruments*, OECD-LEGAL-0475, OECD, Paris, https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0475. [70]

OECD (2022), *Report on the Implementation of the OECD Gender Recommendation*, OECD, Paris, https://www.oecd.org/mcm/Implementation-OECD-Gender-Recommendations.pdf (accessed on 30 June 2022). [131]

OECD (2022), "Subnational government climate expenditure and revenue tracking in OECD and EU Countries", *OECD Regional Development Papers*, No. 32, OECD Publishing, Paris, https://doi.org/10.1787/1e8016d4-en. [104]

OECD (2021), "Building resilience: New strategies for strengthening infrastructure resilience and maintenance", *OECD Public Governance Policy Papers*, No. 05, OECD Publishing, Paris, https://doi.org/10.1787/354aa2aa-en (accessed on 21 September 2021). [78]

OECD (2021), *Driving Performance of Brazil's Electricity Regulatory Agency*, The Governance of Regulators, OECD Publishing, Paris, https://doi.org/10.1787/11824ef6-en. [110]

OECD (2021), *Gender and the Environment: Building Evidence and Policies to Achieve the SDGs*, OECD Publishing, Paris, https://doi.org/10.1787/3d32ca39-en. [66]

OECD (2021), *Good Practice Principles for Data Ethics in the Public Sector*, OECD, Paris, https://www.oecd.org/digital/digital-government/good-practice-principles-for-data-ethics-in-the-public-sector.htm (accessed on 7 April 2021). [137]

OECD (2021), *Government at a Glance 2021*, OECD publishing, Paris, https://doi.org/10.1787/1c258f55-en. [6]

OECD (2021), *Green Budgeting in OECD Countries*, OECD Publishing, Paris, https://doi.org/10.1787/acf5d047-en. [89]

OECD (2021), *International Regulatory Co-operation*, OECD Best Practice Principles for Regulatory Policy, OECD Publishing, Paris, https://doi.org/10.1787/5b28b589-en. [69]

OECD (2021), *Key findings from the update of the OECD Green Recovery Database*, OECD, Paris, https://read.oecd-ilibrary.org/view/?ref=1109_1109272-nuk0ptos4l&title=Key-findings-from-the-update-of-the-OECD-Green-Recovery-Database (accessed on 29 March 2022). [7]

OECD (2021), *Lobbying in the 21st Century: Transparency, Integrity and Access*, OECD Publishing, Paris, https://doi.org/10.1787/c6d8eff8-en. [40]

OECD (2021), *OECD Business and Finance Outlook 2021: AI in Business and Finance*, OECD Publishing, Paris, https://doi.org/10.1787/ba682899-en. [79]

OECD (2021), *OECD Implementation Handbook for Quality Infrastructure Investment: Supporting a Sustainable Recovery from the COVID-19 Crisis*, OECD, Paris, https://www.oecd.org/finance/OECD-Implementation-Handbook-for-Quality-Infrastructure-Investment-EN.pdf (accessed on 30 June 2022). [75]

OECD (2021), *OECD Regional Outlook 2021: Addressing COVID-19 and Moving to Net Zero Greenhouse Gas Emissions*, OECD Publishing, Paris, https://doi.org/10.1787/17017efe-en. [102]

OECD (2021), *OECD Regulatory Policy Outlook 2021*, OECD Publishing, Paris, https://doi.org/10.1787/38b0fdb1-en. [68]

OECD (2021), *OECD Report on Public Communication*, OECD, https://doi.org/10.1787/22f8031c-en. [53]

OECD (2021), *OECD Report on Public Communication: The Global Context and the Way Forward*, OECD Publishing, Paris, https://doi.org/10.1787/22f8031c-en. [56]

OECD (2021), *Paris Collaborative on Green Budgeting*, OECD, Paris, http://dx.doi.org/www.oecd.org/environment/green-budgeting/. [95]

OECD (2021), *Scaling up Nature-based Solutions to Tackle Water-related Climate Risks: Insights from Mexico and the United Kingdom*, OECD Publishing, Paris, https://doi.org/10.1787/736638c8-en. [76]

OECD (2021), *Strengthening Climate Resilience: Guidance for Governments and Development Co-operation*, OECD Publishing, Paris, https://doi.org/10.1787/4b08b7be-en. [17]

OECD (2021), "The OECD Green Recovery Database: Examining the environmental implications of COVID-19 recovery policies", *OECD Policy Responses to Coronavirus (COVID-19)*, OECD Publishing, Paris, https://doi.org/10.1787/47ae0f0d-en. [23]

OECD (2020), *Governance for Youth, Trust and Intergenerational Justice: Fit for All Generations?*, OECD Public Governance Reviews, OECD Publishing, Paris, https://doi.org/10.1787/c3e5cb8a-en. [37]

OECD (2020), *Innovative Citizen Participation and New Democratic Institutions: Catching the Deliberative Wave*, OECD Publishing, Paris, https://doi.org/10.1787/339306da-en. [36]

OECD (2020), *Integrating Responsible Business Conduct in Public Procurement*, OECD Publishing, Paris, https://doi.org/10.1787/02682b01-en. [87]

OECD (2020), *OECD Green Budgeting Framework*, OECD, Paris, http://www.oecd.org/environment/green-budgeting/OECD-Green-Budgeting-Framework-Highlights.pdf. [93]

OECD (2020), "Public servants and the Coronavirus (Covid-19) pandemic: Emerging responses and initial recommendations", *OECD Policy Responses to Coronavirus (COVID-19)*, OECD Publishing, Paris, https://doi.org/10.1787/253b1277-en. [130]

OECD (2020), "Recommendation of the Council on the Governance of Infrastructure", *OECD Legal Instruments*, OECD-LEGAL-0460, OECD, Paris, https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0460. [74]

OECD (2020), *Reviewing the Stock of Regulation*, OECD Best Practice Principles for Regulatory Policy, OECD Publishing, Paris, https://doi.org/10.1787/1a8f33bc-en. [97]

OECD (2020), *Shaping the Future of Regulators: The Impact of Emerging Technologies on Economic Regulators*, The Governance of Regulators, OECD Publishing, Paris, https://doi.org/10.1787/db481aa3-en. [106]

OECD (2020), "The OECD Digital Government Policy Framework: Six dimensions of a Digital Government", *OECD Public Governance Policy Papers*, No. 02, OECD Publishing, Paris, https://doi.org/10.1787/f64fed2a-en. [135]

OECD (2019), *Delivering Better Policies Through Behavioural Insights: New Approaches*, OECD Publishing, Paris, https://doi.org/10.1787/6c9291e2-en. [122]

OECD (2019), *Equal Access to Justice for Inclusive Growth: Putting People at the Centre*, OECD Publishing, Paris, https://doi.org/10.1787/597f5b7f-en. [65]

OECD (2019), *Government at a Glance 2019*, OECD Publishing, Paris, https://doi.org/10.1787/8ccf5c38-en. [77]

OECD (2019), *Productivity in Public Procurement A Case Study of Finland: Measuring the Efficiency and Effectiveness of Public Procurement*, OECD, Paris, https://www.oecd.org/gov/public-procurement/publications/productivity-public-procurement.pdf. [84]

OECD (2019), *The Illegal Wildlife Trade in Southeast Asia: Institutional Capacities in Indonesia, Singapore, Thailand and Viet Nam*, Illicit Trade, OECD Publishing, Paris, https://doi.org/10.1787/14fe3297-en. [51]

OECD (2019), *The Path to Becoming a Data-Driven Public Sector*, OECD Digital Government Studies, OECD Publishing, Paris, https://doi.org/10.1787/059814a7-en. [59]

OECD (2018), *Centre Stage 2*, OECD Centres of Government. [101]

OECD (2018), *Governance Frameworks to Counter Illicit Trade*, Illicit Trade, OECD Publishing, Paris, https://doi.org/10.1787/9789264291652-en. [52]

OECD (2018), *National Risk Assessments: A Cross Country Perspective*, OECD Publishing, Paris, https://doi.org/10.1787/9789264287532-en. [127]

OECD (2018), *Open Government Data Report: Enhancing Policy Maturity for Sustainable Impact*, OECD Digital Government Studies, OECD Publishing, Paris, https://doi.org/10.1787/9789264305847-en. [60]

OECD (2018), *Strengthening Governance and Reducing Corruption Risks to Tackle Illegal Wildlife Trade: Lessons from East and Southern Africa*, Illicit Trade, OECD Publishing, Paris, https://doi.org/10.1787/9789264306509-en. [50]

OECD (2017), *Behavioural Insights and Public Policy: Lessons from Around the World*, OECD Publishing, Paris, https://doi.org/10.1787/9789264270480-en. [121]

OECD (2017), *Impact Update: What Happened Next? Protecting Consumers Through Behavioural Insights: Regulating the Communications Market in Colombia*, OECD, Paris, https://www.oecd.org/gov/regulatory-policy/Colombia-Update-What-Happened-Next.pdf. [111]

OECD (2017), *Investing in Climate, Investing in Growth*, OECD Publishing, Paris, https://doi.org/10.1787/9789264273528-en. [27]

OECD (2017), "Recommendation of the Council on Open Government", *OECD Legal Instruments*, OECD/LEGAL/0438, OECD, Paris, https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0438. [35]

OECD (2017), *Tackling Environmental Problems with the Help of Behavioural Insights*, OECD Publishing, Paris, https://doi.org/10.1787/9789264273887-en. [120]

OECD (2017), *The Roleof Economic Regulators in the Governance of Infrastructure*, OECD Publishing, https://doi.org/10.1787/11824ef6-en. [107]

OECD (2016), *Illicit Trade: Converging Criminal Networks*, OECD Reviews of Risk Management Policies, OECD Publishing, Paris, https://doi.org/10.1787/9789264251847-en. [49]

OECD (2014), "Recommendation of the Council on Digital Government Strategies", *OECD Legal Instruments*, OECD/LEGAL/0406, OECD, Paris, https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0406. [134]

OECD (2006), *Statistics Portal*, http://www.oecd.org/dataoecd/8/61/2376087.pdf. [82]

OECD (forthcoming), *Composite Indicator*. [94]

OECD (forthcoming), *Policy brief: Economic benefits for governments to ensure the integration of RBC standards throughout supply chains in public procurement activities*. [86]

OECD (forthcoming), *Strenghtening decision-making processes to deliver on climate commitments: Review of current government practices*. [31]

OECD/The World Bank (2019), *Fiscal Resilience to Natural Disasters: Lessons from Country Experiences*, OECD Publishing, Paris, https://doi.org/10.1787/27a4198a-en. [96]

OECD/The World Bank/UN Environment (2018), *Financing Climate Futures: Rethinking Infrastructure*, OECD Publishing, Paris, https://doi.org/10.1787/9789264308114-en. [28]

OPSI (2021), *Futures of public administration: Scenarios for talent management in Slovenia*, OECD, Paris, https://oecd-opsi.org/wp-content/uploads/2021/10/Slovenia_Talent_Management_Scenarios_Final.pdf. [119]

OPSI (2021), *Towards a strategic foresight system in Ireland*, OECD, Paris, https://www.ops.gov.ie/app/uploads/2021/05/Towards-a-Strategic-Foresight-System-in-Ireland.pdf (accessed on 29 September 2021). [118]

Oreskes, N. and E. Conway (2010), *Merchants of Doubt. How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*, Bloomsbury Press, https://www.bloomsbury.com/uk/merchants-of-doubt-9781596916104/. [42]

Ramstetter, L. and F. Habersack (2019), "Do women make a difference? Analysing environmental attitudes and actions of Members of the European Parliament", *Environmental Politics*, Vol. 29/6, pp. 1063-1084, https://doi.org/10.1080/09644016.2019.1609156. [133]

Rhodes, E., J. Axsen and M. Jaccard (2017), "Exploring Citizen Support for Different Types of Climate Policy", *Ecological Economics*, Vol. 137, https://doi.org/10.1016/j.ecolecon.2017.02.027. [11]

Rüdinger, A. et al. (2018), "Institut du développement durable et des relations internationales Towards Paris-compatible climate governance frameworks An overview of findings from recent research into 2050 climate laws and strategies GOVERNMENTS BENEFIT FROM STRONG CLIMATE GOVERNANCE FRAMEWORKS IN MULTIPLE WAYS", http://www.iddri.org (accessed on 29 September 2021). [24]

Saha, D. (2018), *Low-carbon infrastructure: an essential solution to climate change?*, World Bank Blogs, https://blogs.worldbank.org/ppps/low-carbon-infrastructure-essential-solution-climate-change (accessed on 29 September 2021). [72]

Sandra Black, J. (2021), *Washington Center for Equitable Gowth - Evidence for a stronger economy*, https://equitablegrowth.org/public-investments-in-social-insurance-education-and-child-care-can-overcome-market-failures-to-promote-family-and-economic-well-being/. [83]

San-Miguel-Ayanz, J. et al. (2021), *Advance EFFIS Report on Forest Fires in Europe, Middle East and North Africa 2020*, Publications Office of the European Union, Luxembourg, http://doi:10.2760/344684 (accessed on 22 September 2021). [124]

Sauer, A. (2018), *Equality Governance via Policy Analysis?*, transcript Verlag, https://doi.org/10.14361/9783839443767. [98]

SEC (2021), "Public Input Welcomed on Climate Change Disclosures", Securities and Exchange Commission, https://www.sec.gov/news/public-statement/lee-climate-change-disclosures (accessed on 13 September 2022). [48]

Supran, G. and N. Oreskes (2017), "Assessing ExxonMobil's climate change communications (1977-2014)", *Environ. Res.*, Vol. Letter 12, https://doi.org/10.1088/1748-9326/aa815f. [43]

Tõnurist, P. and A. Hanson (2020), "Anticipatory innovation governance: Shaping the future through proactive policy making", *OECD Working Papers on Public Governance*, No. 44, OECD Publishing, Paris, https://doi.org/10.1787/cce14d80-en. [117]

UNEP (2019), *Green Public Procurement in the Republic of Korea: A Decade of Progress and Lessons Learned*, United Nations Environment Programme, https://wedocs.unep.org/20.500.11822/32535 (accessed on 23 August 2022). [88]

UNEP (2016), "Environmental Courts and Tribunals: A Guide for Policy-makers", United Nations Environment Programme, https://wedocs.unep.org/bitstream/handle/20.500.11822/10001/environmental-courts-tribunals.pdf. [62]

Université Paris Dauphine-PSL (2021), *Regulatory approaches and tools to meet the decarbonization challenge*, Université Paris Dauphine-PSL, Paris, https://chairgovreg.fondation-dauphine.fr/sites/chairgovreg.fondation-dauphine.fr/files/attachments/Synthe%CC%80se%20confe%CC%81rence%2016042021%20.pdf (accessed on 28 September 2021). [108]

Weaver, S., S. Lotjonen and M. Ollikainen (2019), "Overview of National Climate Change Advisory Councils", *The Finnish Climate Change Panel*, https://www.ilmastopaneeli.fi/wp-content/uploads/2019/05/Overview-of-national-CCCs.pdf. [41]

WICS (2020), *2021-27 Final Determination Strategic Review of Charges*, Water Industry Commission for Scotland, https://wics.scot/system/files/publications/2021-27%20Final%20Determination.pdf (accessed on 28 September 2021). [109]

Williams, D. (2019), "Building accountable resource governance institutions", *U4 Anti-Corruption Resource Centre, Chr. Michelsen Institute*, https://www.u4.no/publications/building-accountable-resource-governance-institutions.pdf. [39]

World Resources Institute (2017), *Climate Analysis Indicator*. [29]

Notes

[1] This value varies across population groups; 41% of world young people aged between 15 and 39 years old think climate change is the top most concerning global issue compared to 16% for those 55 or over.

[2] https://www.pacteclimat.lu/fr/acteur-engage

[3] See for instance the Open Data Charter's Open Up Climate Data guide: Using Open Data to Advance Climate Action at: https://open-data-charter.gitbook.io/open-up-guide-using-open-data-to-advance-climate-a/

[4] https://www.oecd.org/climate-action/ipac/dashboard

[5] See EEA greenhouse gases - data viewer — European Environment Agency (europa.eu)

[6] The Blue Dot Network initiative, building on the G20 Principles for Quality Infrastructure Investment, proposes a common standard of project excellence to attract private capital to infrastructure projects in developing and emerging economies.

[7] See https://www.nccs.gov.sg/who-we-are/inter-ministerial-committee-on-climate-change/#:~:text=The%20Inter%2DMinisterial%20Committee%20on,the%20impacts%20of%20climate%20change

[8] Décret n° 2019-449 of 15 May 2019 on the Ecological Defence Council (legifrance.gouv.fr)

[9] https://digital-strategy.ec.europa.eu/en/news/berlin-declaration-digital-society-and-value-based-digital-government