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Towards the Green Transition

Stimulating investment and accelerating permits for low emissions infrastructure

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Table of contents

FIGURES

Acknowledgements

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Abbreviations and acronyms

Distribution System Operator	DSO
Environmental Impact Assessment	EIA
Environmental Protection Agency	EPA
European Union	EU
International Energy Agency	IEA
Green Public Procurement	GPP
Organisation for Economic Co-operation and Development	OECD
Pre-Commercial Procurement	PCP
Public Procurement of Innovation	PPI
Transmission System Operator	TSO

1 Policy insights

Investment in low emissions infrastructure is essential for reaching net zero by 2050

- To accelerate the energy transition and comply with international climate commitments, countries have to significantly accelerate the deployment of low-emissions infrastructure, such as renewable energy networks and public transport.
- Countries can use many governance tools to help them achieve this, including an agile, efficient permitting system, enhanced stakeholder engagement and green public procurement.

An effective permitting system to deliver the green transition

- Navigating the permitting system is one of the main obstacles to speeding up the energy transition. Developers face long delays and spend costly resources to site, build and operate low emissions infrastructure. This has been highlighted by the International Energy Agency.
- When dealing with low-carbon-emission infrastructure, risks should be assessed in the context of the climate crisis. The permitting system for low emissions infrastructure includes many rules and regulations covering environmental protection, health and safety, infrastructure reliability and other aspects. Governments should prioritise risks to these objectives based on their expected impacts and with a long-term lens. Taking a risk-based approach in environmental licensing of low emissions infrastructure would balance impacts of deploying the infrastructure against climate risks.
- Governments can make permitting more efficient by improving co-ordination among authorities, such as by setting up one-stop-shops for all procedures and enhancing risk-based assessment to streamline burdensome procedures.
- An agile regulatory framework is needed to effectively deploy innovative energy technologies aimed at mitigating climate change. Scientific and technical innovation, and long-term investment decisions, can only thrive when stable governance structures for climate action exist. Adaptive and flexible regulatory assessment cycles and greater reliance on technology for improving the quality of evidence on the risks can help ensure that regulations are sufficiently agile.

The role of stakeholders in achieving net zero

- Countries are facing a fundamental tension between gaining citizen's acceptance of low-emissions infrastructure and accelerating the pace of low emissions infrastructure deployment.
- Stakeholder engagement is a way to ensure that low-emissions infrastructure faces less resistance, greater predictability, and fewer costly delays. It can also ensure that the green

transition takes place in an equitable way that considers the interests of citizens and communities that may suffer economic or other losses.

- Governments need to ensure that they maintain trust while engaging with citizens. This entails improving early-stage participation in the policy cycle when key decisions can still be influenced. At the same time, participation needs to be designed in a way that is meaningful to citizens, allowing them to express their values and preferences.
- Providing financial incentives and sharing the benefits of low-emissions infrastructure is critical, considering that benefits, costs and risks are not shared equitably between those living in proximity to the infrastructure and those living farther away.

Government procurement to catalyse low emissions infrastructure

- Governments can leverage the size of the public procurement market to send investment signals – for example through green public procurement strategies -- to provide the private sector with sufficient certainty to invest in the goods, supplies, labour and skills needed for low-emissions infrastructure.
- Governments can also stimulate markets in new technologies that will be needed for countries to meet their climate goals. Sectors that produce high amounts of emissions and where government is a big spender, such as the construction sector and its use of building materials, offer particular opportunities for market stimulation.

2 Investment in low emissions infrastructure is essential for reaching net zero by 2050

In December 2015, 196 parties, including 174 states and the European Union, signed the Paris Agreement, a legally binding international treaty on climate change. The Agreement's goal is to hold "the increase in the global average temperature to well below 2°C above pre-industrial levels" and pursue efforts "to limit the temperature increase to 1.5°C above pre-industrial levels." To limit global warming to 1.5°C, greenhouse gas emissions must peak before 2025 at the latest and decline 43% by 2030 compared to 2019 levels (IPPC, 2023[1]).

Keeping global temperatures within these limits and mitigating the risks of climate change require countries to accelerate their energy transition and become more energy-efficient. Low emissions infrastructure is also important for strengthening domestic energy production. Russia's war of aggression against Ukraine has raised questions around the political volatility of fossil fuels. By increasing domestic production of low-carbon energy, countries can reduce their energy dependency on fossil fuel producers.

For the purposes of this paper low emissions infrastructure is understood as follows:

> *Low emissions infrastructure incudes assets that either deliver lower emissions, such as electricity production from renewable sources, or that enable lower emissions, such as transmission and distribution networks that connect electricity to consumers, or transport networks, such as rail, metro systems and walking and cycling facilities.*

To illustrate the scale of the transformation required, meeting the Paris Agreement in a way that supports the Sustainable Development Goals requires an estimated EUR 6.7 trillion of infrastructure investment per year until 2030. The international community is currently falling short of meeting this goal (OECD, 2022[2]), making it critically important that countries direct funding towards investments that will most effectively and efficiently reduce emissions and catalyse investment from the private sector. Effective governance tools are essential to realise the required private and public investment.

As part of this targeted investment, many countries will require significant new investment in low-emissions infrastructure. In what the International Energy Agency describes as its most "technically feasible, cost-effective and socially acceptable" pathway to net zero, it discusses how significant new investment in solar, wind, nuclear and bioenergy are needed to reach the net zero goal. To reach net zero by 2050, the IEA identifies that energy supply from solar needs to increase from 5 exajoules (EJ) in 2020 to 109 EJ by 2050; in wind, 6 EJ in 2020 to 89 EJ by 2050; in modern biomass, 38 EJ in 2020 to 102 EJ in 2050; and in nuclear, 30 EJ in 2020 to 61 EJ in 2050.[1]

[1] Fig 2.6. Total energy supply of unabated fossil fuels and low emissions energy sources in the NZE, International Energy Agency (2021), Net Zero by 2050, IEA, Paris.

New energy generation will require major upgrades to existing electricity transmission and distribution networks, as well as utility-scale batteries for storing energy for periods of low supply.

Reaching net zero by 2050 also requires more energy efficiency and less carbon intensity, which can be achieved in part through public transport and active modes of transport, such as walking and cycling. Stimulating public transport and active mode needs a reconfiguration of road space and related investment in infrastructure (OECD, 2021[3]). The IEA's 2050 scenario describes passenger rail nearly doubling its share of total transport activity to 20 percent in 2050 (International Energy Agency, 2021[4]), particularly through mass rapid transit and high-speed rail, reducing reliance on carbon-intensive travel, such as aviation and combustion engine vehicles.

This paper looks at various regulatory and governance tools that countries can use to accelerate low-emissions infrastructure deployment. Chapter 3 discusses the role of effective permitting, in particular considering the role of risks management. Chapter 4 analyses the role of stakeholders in the green transition. Well-designed participation mechanisms for citizens and stakeholders can promote support for low emissions infrastructure; conversely, poor participation mechanisms may undermine trust or even halt climate action. Finally, Chapter 5 addresses the role of public procurement in catalysing low-emissions infrastructure.

3 Effective permitting to deliver the green transition

The green transition requires the fast deployment of low emissions infrastructure. One of the main constraints to delivering more low emissions infrastructure is the long time and costly resources it takes infrastructure providers to navigate the permitting system. Most permitting systems of OECD Members countries (and non-members) have many shortcomings, hindering the ability of those countries to meet their climate objectives. Precisely by noting the need to speed up the green transition, the International Energy Agency (IEA) has highlighted the need for simpler, faster permitting (IEA, n.d.[5]).

The United States is making significant efforts to accelerate environmental permitting, including the establishment of a Federal Permitting Improvement Steering Council and an Infrastructure Permitting Improvement Center (The White House, 2023[6]) (The White House, 2023[6]). The European Commission has recognised that permitting processes are an obstacle for renewable energy projects and has revised its Renewable Energy Directive to simplify them (European Commission, n.d.[7]). The EU Directive requires member states to reduce permitting timeframes for solar facilities from a current average of 4 years down to 3 months, and wind farms from 6-9 years down to 1 year (European Commission, n.d.[8]). The United Kingdom's National Infrastructure Commission has provided recommendations to its government for speeding up the permitting of nationally significant infrastructure (UK National Infrastructure Commission, 2023[9]). New Zealand is developing a new fast-track environmental permitting process for priority infrastructure (New Zealand Government, 2024[10]).

This chapter covers some of the challenges faced by governments in designing and managing a permitting system for low emissions infrastructure. It provides a brief overview of the main regulations, discusses taking a risk approach to permitting, the challenges in streamlining and increasing efficiency and finally highlights the need for regulatory agility to enhance innovation for the green transition.

The permitting system for low emissions infrastructure includes a series of general regulations, technical regulations (and/or standards), documentation, and procedures that project developers must follow to site, construct, and operate the infrastructure. These rules and regulations are designed and managed by different authorities to protect the public interest by mitigating risks. The regulatory framework varies country-by-country and by the specific infrastructure. Yet, the most common permits include environmental, land use, and construction regulation:

- **Land use regulation** defines whether the infrastructure can be developed in a specific land plot. It seeks to make the low emissions infrastructure compatible with the spatial planning either at national, regional, or municipal level. If the type of infrastructure is not compatible with the spatial planning developers must apply for a change in the land plot use. Land use regulations allows governments to deploy infrastructure orderly while considering concerns in urban planning, national security, environmental risks, and to maximise the potential use of the infrastructure.
- **Environmental Impact Assessment (EIA)** is a procedure that evaluates, ex ante, the potential impacts on various environmental sectors, such biodiversity, soil, water bodies, pollution, etc. As part of the EIA process the low emissions infrastructure plan is usually subjected to consultation

with local communities. The aim is to consider their comments early enough in the procedure (this is discussed at length in Chapter 3).

- **Construction regulation** sets the rules and standards to ensure the safety, quality, and reliability of the infrastructure, including its design, construction, and maintenance. Construction regulation can also cover environmental concerns such as energy efficiency of buildings and infrastructure.

Additional permits apply depending on the type of low emissions infrastructure. For instance, to develop industrial wind farms in Lithuania[2], developers must comply with 22 procedures managed by twelve different authorities. Moreover, some of these permits require multiple procedures or "in-between permits". For instance, the EIA, managed by an Environmental Protection Agency, involves, among others, the assessment of the Fire Department, the State Service for Protected Areas. Developers of low carbon emission also face bottlenecks from procedures that are not necessarily permits themselves. Depending on the institutional arrangement of the energy sector, the connection to the electric grid can be managed by public authorities or private system operators (Transmission System Operators or Distribution System Operators). The system operators request a series of documents and details of the projects to study the feasibility of granting certain capacity to the proposed projects and require the testing of the infrastructure.

Governments need to balance public risks from low emissions infrastructure with climate change commitments

As abovementioned, regulations governing the deployment and use of infrastructure cover specific public concerns. Even though all public concerns are legitimate, risks should be assessed in a wider context and not individually. In the case of low emissions infrastructure, regulators should assess the risks of deploying infrastructure against climate change risks resulting from slowing down the energy transition. A recent paper by the OECD discusses the need for countries to consider risk vs risk trade-offs, system risks, and cumulative risks. This contrasts with an approach of looking at risks individually.

> *The objective of breaking down silos should drive this adaptation. In line with existing OECD recommendations, steps should be taken to strengthen co-operation across policy-making departments and regulatory agencies, as well as between national and sub-national levels of government. It may also be valuable to explore how regulatory oversight bodies can help to ensure that precautionary approaches are holistic and well-balanced.*

Source: (OECD, 2023[11])

Comparing risks posed by green infrastructure deployment compared to their "non-green" equivalent in the short and long term could be more relevant than individual risk analysis (for example comparing a hydrogen refuelling station and a fossil fuel station) (OECD, 2023[12]). Regulations should adequately balance the potential hazards of the infrastructure against climate risks. What this means in practice is that governments can prioritise low carbon emissions infrastructure by placing special considerations in their regulatory frameworks. Risks to long-term climate change objectives can be further reduced through strategic planning, i.e. before permitting through spatial planning/zoning based on environmental values.

A risk-based approach for the permitting system can allow governments to streamline regulation for low-risk scenarios. The focus of regulators should be on those areas where the outcomes and probabilities are most problematic. By including different specific scenarios in legislation, regulators can enhance or relax the regulatory requirements according to the level of risk. For instance, low-risk and generally small-scale installations can be simplified processes as the safety issues (both to environment and the public) are not

[2] For project with over 50MW capacity, 7 or more wind turbines and turbines higher than 100 meters.

severe (however, it is important to consider cumulative impacts of multiple small-scale installations). This is already taken into account in European countries where the EIA is not required for small scale projects.

Improving efficiency and transparency can lead to a better sector development

Navigating the permitting system can be complex. In many countries it is unclear where to start the process and what path to follow. Governments do not just tend to regulate risks individually, they also manage the permits in siloes. This leads to duplications in documentation requested, and in some cases to multiple authorities taking the same decision (with potentially different conclusions). Duplications invariably lead to delays in permitting and an increased economic burden to both government and industry. Excessive bureaucracy can also lead to psychological hurdles such as decision-making fatigue, cognitive overload, and decision paralysis.

Flaws in the low carbon emission licensing process can create also risks for corruption or undue influence. Public office holders working in licensing processes are at risk of undue influence when some companies are responding to increased demand by seeking preferential treatment or access to speed up licensing processes or to conceal or compensate for misleading or inadequate applications. These risks in the licensing process are especially acute when there is greater discretionary decision making (without accountability measures), unclear assessment criteria, or limited opportunities for public scrutiny and participation (Transparency International Australia, 2022[13]). OECD countries must ensure that public office holders working in licensing and regulation are subject to adequate conflicts of interest processes and that, where appropriate, licensing decisions are subject to strong transparency requirements and open government policies.

To increase the efficiency of the permitting system, governments can start by improving co-ordination within government. This can include a joint assessment of the rules and regulations, interoperability of databases, or establishing a one-stop-shop. While ultimately leading to a smooth digitalised process, countries face the challenge of streamlining the process as a whole and avoiding “digitalising bureaucracy”. By improving the organisational, technical and legal culture governments can avoid requesting information multiple times (e.g., licences, certificates). As part of these efforts to reduce inefficiencies, governments can incorporate a "sludge audit" methodology. This methodology is specifically designed to identify unnecessary frictions in processes and discover opportunities for addressing them (OECD, 2023[14]).

Implementing a notifications system can help simplify permitting processes. This is particularly useful when project poses a low risk. Notifications are used when regulators want to collect data related to an operator, their activities, or characteristics. This information is collected to define the need of a regulatory oversight activity such as risk assessment or inspections. Therefore, notifications are more of an information collection process and do not relate to approval processes. Notifications can be linked to other existing procedures. Once data is collected from other procedures regulators would be able to access the data without the imposing additional burden to the industry. Through digitisation and proper storage of data, operators can be freed from the obligation of supplying the same information multiple times.

Prior assessments for certain large scale projects involving wind and solar farms, or geothermal energy, in certain designated areas can lower permitting related delays (OECD, 2024[15]). To select designed renewable energy areas, permitting authorities can perform ex ante early public consultations, strategic environmental assessments (including cumulative assessments) and environment impact assessments and safe approach plans. Integrating environmental and cultural heritage considerations while planning the introduction of low carbon energy can balance different societal interests. This preparation can significantly reduce the potential barriers an operator may face during the authorisation phase. It can also improve investment in low carbon energy once it is known that an early assessment has already been performed. Further, knowledge from such pre-assessments can serve as useful guidance while preparing for future energy projects in other locations (see Box 1 for an example of EU “Go-to areas”. This follows

on making spatial planning more efficient especially when land for both offshore and onshore low carbon energy projects is limited. Mainstreaming biodiversity and other values into spatial planning is critical for minimising potential trade-offs across policy objectives and can be facilitated by decision support tool such as environmental (wildlife) sensitivity mapping (OECD, 2024[15]).

Box 1. "Go-to areas" for renewable energy infrastructure in the EU

A "go-to area" is a "specific location, whether on land or sea, particularly suitable for the installation of plants for the production of energy from renewable sources (…) where the deployment of a specific type of renewable energy is not expected to have significant environmental impacts" (European Commission, n.d.[16]). According to the proposal for a directive of the European Commission (European Commission, 2022[17]), Member States are advised to identify "go-to areas" based on the following criteria:

- Priority to artificial and built surfaces (rooftops, transport infrastructure areas, industrial sites…)
- Exclusion of Natura 2000 sites, nature parks, reserves and bird migratory routes.
- Use of all appropriate tools and datasets to identify the areas where the renewable energy plants would not have a significant environmental impact.

States can use the EU one single platform mapping tool developed by the Energy and Industry Geography Lab to identify renewables "go-to areas", thanks to visual representation of consolidated information on different energy and environmental factors.

Source: Acceleration areas for renewables - European Commission (europa.eu) and Commission proposal for a « Directive of the European Parliament and of the Council amending Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources, Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency Acceleration areas for renewables - European Commission (europa.eu)

To fully benefit from permitting beyond a "one-time" activity for new facilities, it could also be understood as a clear and predictable framework aimed at continuously minimising environmental impacts. In this sense, it should be aimed at outlining a binding transformation pathway at plant level with interim milestones, end-goal and indicators compatible with climate, zero pollution and circular economy targets. This would provide clear signals to markets and investors, certainty and adjustment time for industry as well as high confidence in meeting environmental targets.

Digital tools can enhance clarity and transparency in the permitting process

The lack of a digital one-stop-shop raises inefficiencies and delays in the permit applications of low emissions infrastructure. As project developers apply to permits individually, they can face a lack of clarity in the sequence required to obtain all the different permits. In absence of a digitalised process, the interaction between industry and government is slower, and potentially less transparent. In some cases, government can receive applications in PDF versions, through digital inboxes. Yet, this doesn't allow government to untap the benefits of a digitalised system as data in pdf format is not open data.

Setting up a digital one-stop-shop is challenging, not only on a technical level, but also in terms of institutional coordination. Depending on the level of digital maturity, countries might have a complete absence of an IT system capable of storing information from procedure applications, or in some cases IT systems hosted by different line Ministries which are not interoperable with other systems.

To address this issue, the EU recently adopted its *Net Zero Industry Act* (European Commission, n.d.[18]), which requires its Member States to develop a one-stop-shop for green infrastructure and to have a single point of reference when they want to apply for a permit. This can lead to a full integration of the procedure in one single platform, improving clarity and easiness of the process for the industry. The delegated authority to the one-stop-shop will be responsible to liaise with the relevant authorities to follow up on the next steps of the permitting process.

Artificial intelligence (AI) can raise efficiencies and improvements in administrative systems and reduce corruption. It can improve the efficiency of public services and administrative processes through reducing costs, enhancing productivity, and improving the quality of services and products offered to the public. But it can also reduce opportunities for corruption or undue influence among public office holders. Complex and unclear rules, red tape and inefficiency, and public office holders feeling disempowered by the system are among the main drivers of corruption in the public sector.

AI can address these issues by simplifying administrative procedures or reducing public office holders' use of discretionary powers. For example, rules and regulations can be encoded as computer code and integrated into automated systems. These systems can then ensure that rules are applied consistently and fairly, reducing the risk of human error or the abuse of discretion, and improving the efficiency of the process (U4, n.d.[19]).

More efficient and effective regulation can attract investment

New investment in low emission infrastructure will require participation from the private sector across many stages of the lifecycle, including legal, planning, design, engineering, funding, financing, construction and maintenance. For the private sector to make this commitment, it typically requires a steady, predictable and reliable pipeline of projects to have the confidence to invest the capital as well as in the necessary people, plant and equipment. In turn, countries will benefit from having access to high quality skills and capabilities to draw upon at different stages of the investment lifecycle when implementing new, low emission infrastructure at scale and pace.

However, a complex, uncertain regulatory environment can undermine the private sector's confidence to invest. A 2021 European Investment Bank (EIB) Survey of EU firms in the manufacturing, construction, services, and infrastructure sectors found that 65% of respondents described business regulations as the main barrier to investment, alongside the availability of skilled staff (79%), uncertainty about the future (73%) and energy costs (65%) (European Investment Bank, 2021[20]). The survey also found that, in North America, 71% of infrastructure firms described business regulations (71%) and labour market regulations (70%) as main barriers to investment, alongside the availability of skilled staff (92%) and uncertainty about the future (77%) (European Investment Bank, 2021[21]).

The EIB Municipalities Survey 2020, which surveyed municipal governments receiving financing across the EU, found that two of the most important barriers to investment related to regulations, including the length of regulatory processes (85%) and regulatory uncertainty (83%). It is also worth noting that 88% of larger municipalities generally reported that a lack of agreement among stakeholders represented an important barrier (European Investment Bank, 2021[22]).

Agile regulatory governance can foster innovation for the green transition

An agile regulatory framework is needed to effectively deploy energy technologies aimed at mitigating climate change effects. Scientific and technical innovation can only thrive when stable governance structures for climate action exist. In addition to agile governance, competent governments should foster

innovation domestically and also enable collaboration between different stakeholders. One type of collaboration is needed in the public sphere between governments at various levels i.e., municipal, regional, national, and international. The second is to foster co-operation between the private sector, the public at large and the government.

Low carbon energy technology, much like conventional fuel have several stages (production, transportation, storage, and usage) that each need regulatory oversight through documentary checks, inspections, risk assessments, compliance, and enforcement. Each of these stages have unique design specifications, occupational and environmental safety requirements and therefore need financial investment, scientific research on safe use, and public acceptance. At the core of it is the need for a regulatory system that must allow and support these innovations, investments, rollouts, and acceptance.

Regulations have to be sufficiently agile through adaptive and flexible regulatory assessment cycles and through greater reliance on technology and big data for improving quality of evidence on the risks. As described above, regulatory responses must be risk proportionate and should manage the risk trade-offs i.e. the trade-offs between the harms of climate change and the safety risks from producing, transporting, storing and using low carbon energy. Regulatory action should be *seen* to protect the public against the actual harms that may arise from using low carbon energy technologies. The goal should be to improve trust in the public against the perceived harms of low carbon technologies.

The OECD Council Recommendation for Agile Regulatory Governance to Harness Innovation (OECD, 2021[23]) provides an adequate framework to review and revise regulatory systems in this perspective. In addition to this, given the challenges specific to the low carbon energy sector, governments need specific knowledge and guidance to support the efforts related to smooth energy transition.

4 Stakeholders will play a vital role in meeting net zero

The quality of engagement with stakeholders will affect the pace of uptake

For many individuals, new infrastructure developments impose risk and uncertainty. People living close to new developments, such as wind farms, are often exposed to noise and visual impacts as well as disruption during the construction phase. Individuals may be financially impacted if their property values are negatively impacted by their proximity to infrastructure. New infrastructure can have an impact on sites of archaeological, cultural or religious significance to local communities.

To limit such potential negative consequences for citizens and communities, regulatory frameworks across OECD countries recommend the participation of stakeholders for major infrastructure developments. The Recommendation on the Governance of Infrastructure underscores the critical role of stakeholder participation and meaningful engagement with impacted communities (Box 2). Other multilateral instruments, such as the United Nations Aarhus Convention (United Nations, n.d.[24]) constitute a legal framework, which mandates access to information and allows citizens to participate in decision making on environmental issues.

Box 2. 2020 OECD Recommendation on the Governance of Infrastructure

Ensure transparent, systematic and effective **stakeholder participation** through:

a) providing and taking proactive measures to disseminate information on infrastructure projects, including their potential short and long-term effects, and allow for continuous, inclusive, social and open dialogues that are broad-based, involving relevant stakeholders in planning, decision-making and oversight.

b) integrating consultation processes that are proportionate to the characteristics of the project (e.g. size, political sensitivity, environmental aspects, impacted population) and that take account of the overall public interest and of the views of the relevant stakeholders through a disciplined, upfront stakeholder mapping and analysis, which can ensure engagement efforts cost-effectively to include relevant groups in decision making.

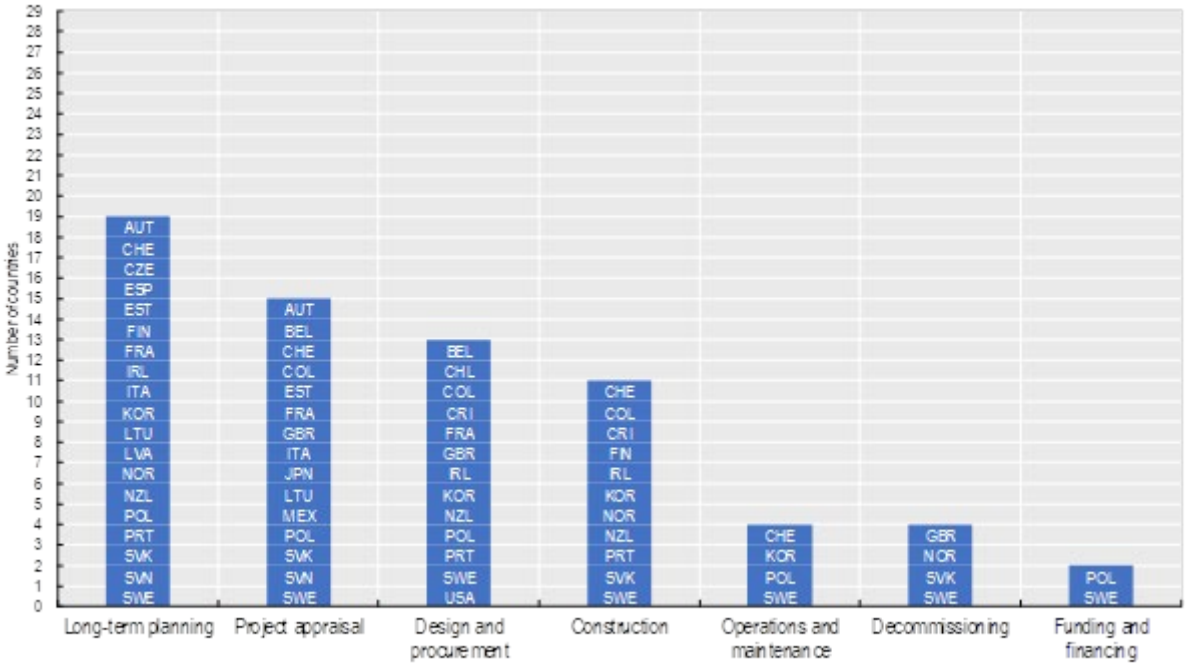
c) ensuring meaningful stakeholder engagement with users and impacted communities to collaborate during the relevant phases of the project life cycle, ensuring debate and oversight on the main economic, fiscal, environmental and social impacts of the project.

Source: (OECD, 2020[25])

Inclusive stakeholder consultations also can improve socio-economic outcomes, such as by protecting marginalised communities from negative impacts. Experience shows that a lack of inclusive approaches in major infrastructure projects may have dire consequences for the most vulnerable groups, leading in most extreme cases to displacements and associated human rights abuses (OECD/IOC, 2023[26]). In OECD countries regulatory frameworks and practices to ensure citizen participation are well established. As shown in Figure 1, mandatory consultations are foreseen in particular for long-term infrastructure planning (19 countries), but also at various stages throughout the infrastructure life cycle.

Figure 1. Mandatory consultation in the infrastructure life cycle

At which points in the infrastructure life cycle* is it mandatory to consult with stakeholders* on the environmental or climate related impacts of infrastructure investments?



Note: The terms followed by * were defined in the glossary of the survey
Source: OECD (2022), Survey on the Governance of Infrastructure

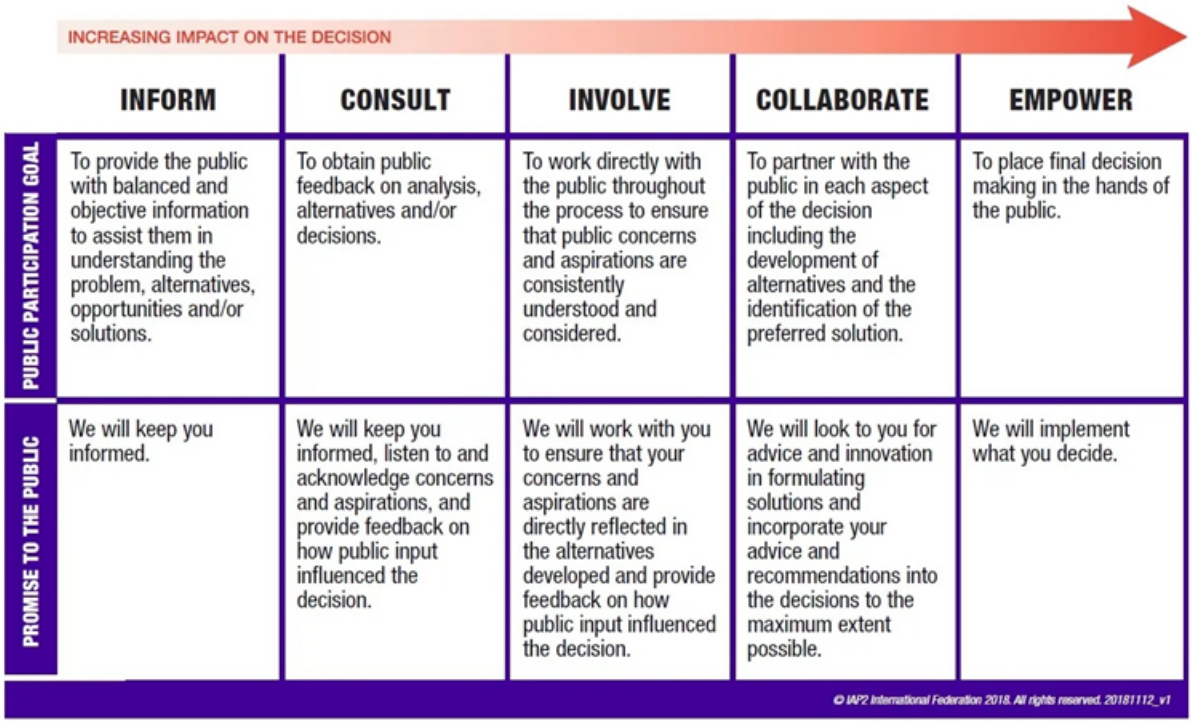
While citizen participation is beneficial to secure acceptance of new infrastructure developments, in the context of the green transition countries are facing a fundamental tension between ensuring citizen participation and acceptance of low emissions infrastructure, but at the same time accelerating the pace of infrastructure deployment.

The imperative of trust in citizen and community participation

Given the transformational nature of the green transition, it is vital to engage with citizens and ensure public acceptance with the overhaul of the current energy system. This is not only a moral and, in many instances, a legal obligation for countries towards their citizens, but also a way to ensure that low emissions infrastructure faces less resistance and fewer costly delays. At the same time, the green transition needs to happen equitably and in a way that considers the interests of citizens and communities that stand to lose from it. Figure 2 shows the different levels of engagement – from sharing information to empowering

citizens with decision-making – that countries can consider when adequately involving stakeholders in the decision-making process.

Figure 2. Public Participation Spectrum



Source: International Association for Public Participation (2018)

- **Stakeholders**: any interested and/or affected party, including institutions and organisations, whether governmental or non-governmental, from civil society, academia, the media or the private sector.
- **Citizens**: individuals, meant in the larger sense of 'an inhabitant of a particular place', which can be in reference to a city, region, state, or country, and is not meant in the more restrictive sense of 'a legally recognised national.

In many cases, public administration dealing with infrastructure development may have mechanisms in place to deal with organised 'stakeholders', but may be less organised to conduct engagements with regular citizens, or marginalised communities. In fact, only 27% of OECD countries mandate outreach to under-represented groups (OECD, 2023[27]). The types of engagement needed may also differ depending on the type of project. Public transport construction may require different engagement practices compared to solar, wind or geothermal energy projects deployment. Moreover, it is important to know the communities well in advance of launching a participation exercise. Communities that may already be distrustful of government may react poorly if the engagement exercise is perceived as one-off, and meant to push towards acceptance of a certain outcome.

Similarly, authorities need to openly tackle discussions about the risks introducing certain technologies, such as hydrogen and nuclear. Refraining from these conversations exacerbates the risk of misinformation and disinformation being spread, which is important given the acceleration of misinformation and disinformation in recent years and its ability to cast doubt on factual evidence, aggravate existing societal

divisions and create difficulties building societal consensus essential to address complex policy challenges (OECD, 2024[28]).

Most importantly, governments need to ensure that they maintain trust while engaging with citizens. It is vital that citizens perspectives and views are actually being dealt with in a meaningful way. To this end, citizens need to feel heard and understand how their input contributes to final decision-making. The majority of OECD countries (84%) report informing stakeholders about how and why their input has been considered in permitting procedures. Nevertheless, citizens and stakeholders often complain about the lack of a feedback loop when they are engaged in participation mechanisms.

If organised well, citizen participation can enrich democracy and meet the urgent need for action to combat climate change. Conversely, if organized inadequately, participation can undermine trust, fuel resistance or even halt climate action.

This is exemplified by the United Kingdom's inadvertent restrictions on new onshore wind farm development until September 2023, which was imposed by legislation from 2015 that enabled local authorities to block the development of new turbines following a single objection (Stacey and Horton, 2023[29]).

While in the UK this legislation was overturned, the US moratorium on offshore leasing in some areas of the Gulf of Mexico illustrates that the issue of public participation impeding climate action is ongoing (Parker, 2022[30]). Many examples have shown that once authorities or project developers have lost trust of their citizens, they may never be able to win it back (Mazengarb, 2021[31]).

Ensuring early-stage and meaningful participation to accelerate the green transition

To ensure that citizen participation is meaningful and establishes trust, governments also need to navigate a paradox of citizens' experience with participation process. Namely, citizens are most keen on participating in local decision-making about concrete projects that have a tangible impact on their day-to-day life. However, participation at this stage often means that the project development is already well-advanced, and the scope for influencing decision-making via citizen input is limited. Furthermore, local projects are developed based on overarching policy constraints (e.g. land use planning or energy policy). Hence participation may result in a binary choice of acceptance or rejection of a particular infrastructure project. This exacerbates the risk of NIMBYism[3] and could lead to slow down of low emissions infrastructure implementation. In contrast, citizens show less interest in participating at higher level policy-making, where their input would actually have a bigger impact towards shaping decisions around infrastructure, climate- and energy-policy (Perlaviciute and Squintani, 2020[32]).

One way to address this paradox is to frame participation in a way that is meaningful to citizens. This is an approach taken often by local authorities when using tools such as Citizen Assemblies to address broad questions such as "the sustainable future of the community" that allow citizens to express their values and preferences. In the Netherlands, for instance, the municipality of Borsele developed so-called conditions for energy projects based on a participatory consultation process with randomly selected citizens[4]. The consultation process was launched in response to a planned nuclear development, but focused on broader questions around the liveability of the municipality and its role in the energy transition, instead of being a referendum on a nuclear project.

New Zealand has focused on strong stakeholder engagement to develop a vision for the community towards a future away from fossil fuels. As part of its 'Just Transition' approach, the central government is providing technical support to regional authorities and communities to develop their own just transition

[3] NIMBY – "not in my backyard": a phrase referring to parties who resist new developments in their locality.

[4] https://www.borsele.nl/borselse-voorwaarden-groep

strategies based on strong citizen and community engagement (see Box 3). The support provided through a dedicated government unit is directed to regions most impacted by the energy transition, e.g. due to strong economic dependence on fossil fuel industry. Robust engagement at an early stage, dedicated to shaping the long-term vision paves the way for greater acceptance of concrete low emissions infrastructure projects down the line.

Box 3. New Zealand Just Transition Partnership team

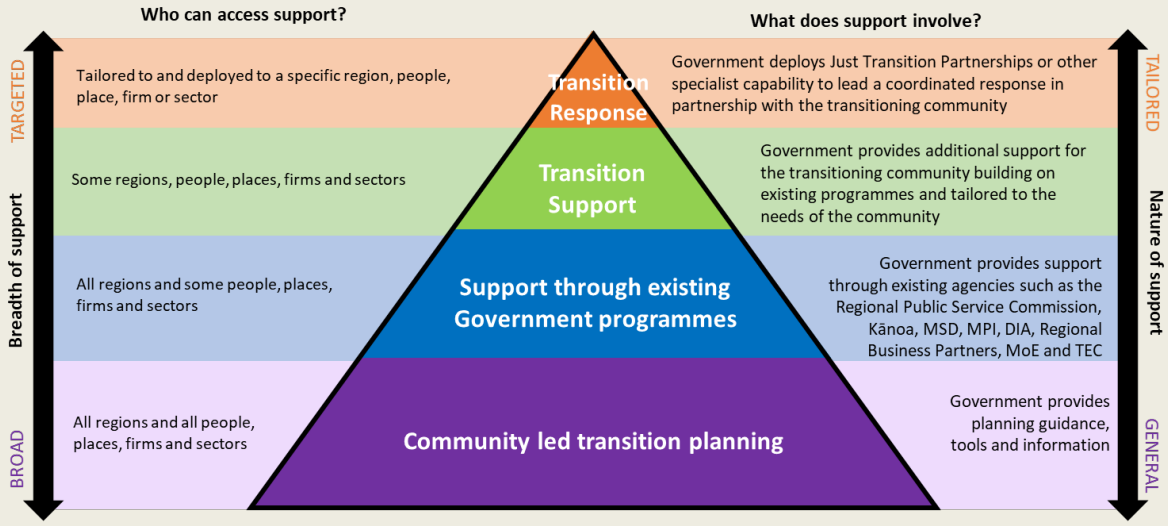
To assist regions with unavoidable economic and social change, New Zealand established the **Just Transition Partnership (JTP) team,** a national government unit dedicated to supporting regions through a transition to a new economic model. The JTP supports local government by liaising between national and sub-national government to identify pre-existing national-level funding opportunities, provide expertise for collaborative planning processes and make links to other relevant national government processes. Sub-national government remains in the driving seat to define and implement community-led strategies (pathways) to support the green transition.

An example of a JTP team supporting a region transitioning away from oil and gas production and towards offshore wind production is the "Taranaki 2050" Taranaki, New Zealand. The creation of the Taranaki 2050 roadmap involved extensive participation from stakeholders across the region. Namely, over 700 people took part in 23 workshops and 5 community workshops. Over 360 people completed surveys online or at events. All inputs gathered created the Taranaki draft 2050 Roadmap. Additional input involving 40 sessions with over 1000 people, and 70,000 engagements led to the finalised version of the Roadmap.

Another example is from Southland, a region transitioning away from its economic reliance on an international aluminium smelter. Also involving extensive engagement with stakeholders, this exercise resulted in a package of targeted support measures, with funding commitments from national government, to support Southland to be more economically sustainable while also supporting the economic aspirations of the region.

Figure 3 shows the nature of support the JTU provides to regions.

Figure 3. Support from the Just Transition Unit to regions



Source: New Zealand Ministry of Business, Innovation & Employment, https://www.mbie.govt.nz/business-and-employment/economic-development/just-transition/the-just-transition-partnership-team/

Another approach can focus on understanding stakeholders and their preferences at an earlier stage in the project development compared to how this is currently carried out. This approach would allow project developers to adapt the project plan (or related options) by better taking into account stakeholders views and bargaining power (see Box 4).

Box 4. Reducing costs and delays through strategic stakeholder management

The stakeholder management theory traditionally focused on the moral and ethical case for involving stakeholders in infrastructure decision-making. However, there is also an economic case: if permission is needed from stakeholders on the progress of an infrastructure development, they may need to be compensated or otherwise convinced to "grant their permission". For infrastructure developers, the following questions become important at this point:

- can these stakeholders be bargained with in the first place (e.g. some could be categorically against a project)?
- what are the strategies that could be applied to best engage them?
- how does project budget contingency impact the appetites of the stakeholders and 'who gets what'?

In the context above, the view of the New Stakeholder Management Theory (NSMT) argues that cost growth and delays increase because infrastructure requires the consent of people (Gil, 2023[33]) . While generally the focus for addressing cost overruns and delays is through greater project contingencies to achieve better on-budget and on-time performance, NSMT instead argues that a greater focus should be placed on understanding what can be done to gain the consent of stakeholders.

Putting NSMT theory in to practice by better understanding the concerns and opportunities through the eyes of stakeholders is a promising area of further exploration that could contribute to resolving the challenge of cost control and permitting time delays.

Source: (Gil, 2023[33])

Financial incentives could help gain the consent of stakeholders

A major barrier for developing new low emissions infrastructure can be that the benefits accrue to citizens located elsewhere or to future generations, but that the costs and risks are predominately borne by present generations living in close proximity to the infrastructure. This can lead local people today to object to new low emissions infrastructure, resulting in time delays and additional costs. For example, new renewable energy installations that replace fossil-fuel energy generators may improve the environment and result in fewer carbon emissions for future generations living in distant locations. Meanwhile, those living near the new renewable energy developments may be impacted by visual or noise impacts and experience negative impacts on their property values. Older stakeholders may also not experience the long-term benefits of renewable energy, such as better air quality and less environmental damage caused by emissions.

For this reason, some countries have been exploring how local, affected parties can share in the financial benefits of new low emissions infrastructure. For example, the United Kingdom's National Infrastructure Commission has recommended that the Government "develop a framework of direct benefits for local communities and individuals where they are hosting types of nationally significant infrastructure which deliver few local benefits". The Commission adds: "The government, regulators and developers should consider the merit of socialising costs through utility bills or public expenditure to extend the benefits of projects which deliver national but not local benefits to local communities. Practically, incurring increased costs early in a project could avoid higher costs subsequently being incurred as a result of delays to the consenting process. This could ultimately reduce costs for all consumers through lower bills or public expenditure savings." (National Infrastructure Commission, 2023[34])

Similarly, the European Commission has developed the framework for "energy communities", which help enable collective and citizen-driven energy actions to support the clean energy transition. They can contribute to increasing public acceptance of renewable energy projects and make it easier to attract private investments in the clean energy transition. Energy communities can be an effective means of re-structuring energy systems by empowering citizens to drive the energy transition locally and directly benefit from better energy efficiency, lower bills, reduced energy poverty and more local green job opportunities. Under Article 2(16) Recast Renewable Energy Directive, energy communities are autonomous entities controlled by shareholders or members located in close proximity to a renewable energy project. The shareholders or members could include natural persons, small-to-medium enterprises (SMEs) or local authorities. The European Commission provides support to energy communities through the Energy Communities Repository, which, since April 2022, has provided support to 150 energy communities with setting up groups, advancing their projects, developing financial concepts and other training (European Commission, n.d.[35]).

However, it may not be straightforward to financially compensate for all impacts because the features that are impacted, such as the benefits of accessing cultural and heritage sites or the intrinsic value of amenity or access to recreation are subjective and difficult to quantify. To make timely permitting decisions that take these types of impacts into account, permitting authorities need information about a wide cross-section of people's preferences and the trade-offs those people are willing to make.

Traditionally, cost-benefit analysis has been used to quantify the market benefits and costs of environmental features, such as carbon offsets from forests and public health savings from improving air and water quality. Economists have attempted to understand the non-market benefits through a method called Total Economic Value, which attempts to quantify the intrinsic value of environmental, historical or cultural sites. Box 5 includes an example of where the OECD has applied the "willingness to pay'' method understand people's preferences when paying for water service improvements, which is a method that could equally be applied to new, low emissions infrastructure.

Box 5. Understanding people's willingness to pay for improved water services in Scotland

The OECD has recently used an approach that could help decision-makers understand the prices people are willing to pay for benefits, and the costs they are willing to bear, for infrastructure and its related services. While this study focused on the premiums people would be willing to pay for benefits, it could also be used to understand the reductions in utility prices people are willing to accept for reduced amenity and environmental quality. This information could help countries reach quick resolutions when economic, social and environmental trade-offs need to be made.

In 2022, the OECD partnered with the Water Industry Commission for Scotland to understand the premiums consumers were willing to pay to receive additional benefits from their water network. The first stage asked participants to rank seven benefits in order of importance, including reducing interruptions to supply, reducing external sewer flooding, connecting rural supplies to the water system, and increasing the share of renewable energy generated by the water industry. Results did not show that any one benefit was more important at this stage. Next, participants were asked to allocate an unknown amount of money between the four improvements listed above. Here, participants allocated the most money to external sewer flooding, followed by renewable energy, interruptions to supply and rural supplies.

Participants were next asked to state the maximum amount of money they would be willing to add to their current water bill if they knew the revenue would go towards the four target improvements. On average, participants were willing to add GBP 11.03 to their water bills (an increase of around 2.5% in the bills). However, 40% of participants indicated that they were unwilling to add any additional amount to their charges. In the fourth stage, the experimenters revealed the costs of the target improvements. The participants could manipulate the amount they would be willing to add to their bill and the percent allocation to each benefit. The programme told participants how much of the improvements would result if everyone invested the same amount. In this stage, participants' percent allocations remained about the same, but 14% of participants increased their water charge. The final stage added time horizons, indicating whether benefits would be delivered immediately, in five years, in ten years or in 25 years. This stage saw a significant increase in allocation towards immediate benefits.

Source: (OECD, 2022[37])

5 Government procurement can catalyse low emissions infrastructure

Public procurement plays a significant role in helping countries deliver the low emissions infrastructure needed to meet their climate goals. As a major purchaser of public goods and services, representing on average 12.9% of GPD in 2021 (OECD, 2023[27]), governments can use their scale to send investment signals so the private sector can have sufficient certainty to invest in the goods, supplies, labour and skills needed for low emissions infrastructure. Due to their large scale, governments can also stimulate markets in new technologies that will be needed for countries to meet their climate goals. This could either include the procurement of outputs, such as rail lines or cycling facilities that may help incentivise a reduction in emissions, or inputs, such as concrete or steel that may include embodied carbon emissions.

Furthermore, the consumption patterns of government can also influence market investment in low emissions infrastructure technologies. For the deployment of low emissions infrastructure, governments have significant leverage to incentivise the use of low emissions inputs and green technologies through public procurement contracts. Countries can also ensure that procured infrastructure is built according to the latest energy efficiency and zero carbon standards, and incorporates clean technologies. While countries can leverage procurement in this regard, it is important they do so while also upholding a whole of government approach to managing integrity across the public procurement system (OECD, 2020[25]). Introducing public procurement of innovation practices can further support the technological transition towards low emissions infrastructure.

Governments may also play a role in delivering low emissions infrastructure through by speeding up public procurement processes, either directly, e.g. in countries where SOEs are largely responsible for energy production, or through concessions of renewable energy projects to private sector developers.

Applying a risk-based approach to procurements of low emissions infrastructure

In the context of procuring low emissions energy, countries can also ensure that procurement processes do not pose an additional implementation barrier, on top of frequent bottlenecks identified around permitting and stakeholder engagement. Depending on the type of project, the implementing entity (e.g. private or SOE), or the source of funding, a particular renewable energy project may fall under a public procurement regime. If that is the case, general principles of open and competitive tendering would apply. Even if the low emissions infrastructure projects do not fall under a public procurement regime, these projects would typically follow a competitive tendering process.

Considering the need to accelerate the roll-out of low emissions infrastructure, it is critical to ensure that procurement processes are conducted in the most efficient way. Procurement procedures are known to be frequently delayed, or generally taking very long time[5], and are often considered burdensome.

In addressing these issues, governments can take several approaches to ensure that procurement procedures are not overly prescriptive and meet the need related to the efficient roll-out of low emissions infrastructure. In this respect, it is worth considering applying a risk-based approach to public procurement procedures, and identifying simplification steps based on the complexity and inherent risks of the procurement procedure (OECD, 2023[38]). This involves also looking at risks that may arise from the supply chain and have the potential to slow down the delivery of low emissions infrastructure. Furthermore, countries could also consider setting up systems for fast-tracking procurement whenever they are directly involved as the purchasing entity. This could entail strengthening technical capacity by ensuring that staff have the right skills and competencies, both from a procurement and technical perspective. Standardisation of the full process (e.g. from needs assessment to market analysis, and preparation of tender documentation) could also support faster procedures. An area of support includes supporting municipalities in navigating the procurement process effectively, e.g. through enhanced participation of energy communities in the procurement process (see Box 5.1).

Box 5.1. REScoop.eu Procurement Guide for Community Energy

The European federation of citizen energy cooperatives (REScoop.eu) is a network that represents 2,250 European energy communities and 1.5 million citizens active in the energy transition. REScoop are energy cooperatives, in which citizens jointly own and participate in renewable energy or energy efficiency projects. As part of its mission, REScoop.eu developed a dedicated procurement guidance which supports municipalities in collaborating with energy communities, in particular by better adapting the procurement process to enhance participation of REScoops, and hence support renewable energy production. The guidance reviews the main steps of the procurement process and offers concrete examples of procurements and concessions, in which municipalities have procured renewable energy from an energy community.

Source: (REScoop.eu, 2023[39])

Signalling future green investment to the market

The green transition relies on robust markets to deliver low emissions infrastructure and related technologies. To best prepare the market for this challenge, countries should be sending clear signals about their green infrastructure investments over the medium to long term. This gives potential suppliers the necessary assurance to step up preparations to deliver low emissions infrastructure, if they wish to compete for public contracts.

Countries have long used green public procurement (GPP) strategies to send investment signals to the market about green alternatives when procuring goods, services or public works. GPP refers to the practice of procuring goods and services using environmental requirements, with the aim of cutting carbon emissions and mitigating environmental harm throughout the life cycle of the product or service.

[5] In the EU, decision speed for awarding a tender of 120 days is considered good practice according to the EU's Single Market Scoreboard. Several countries take longer in their award decision. This time does not consider further delays that may occur in contract implementation, or the procurement planning.

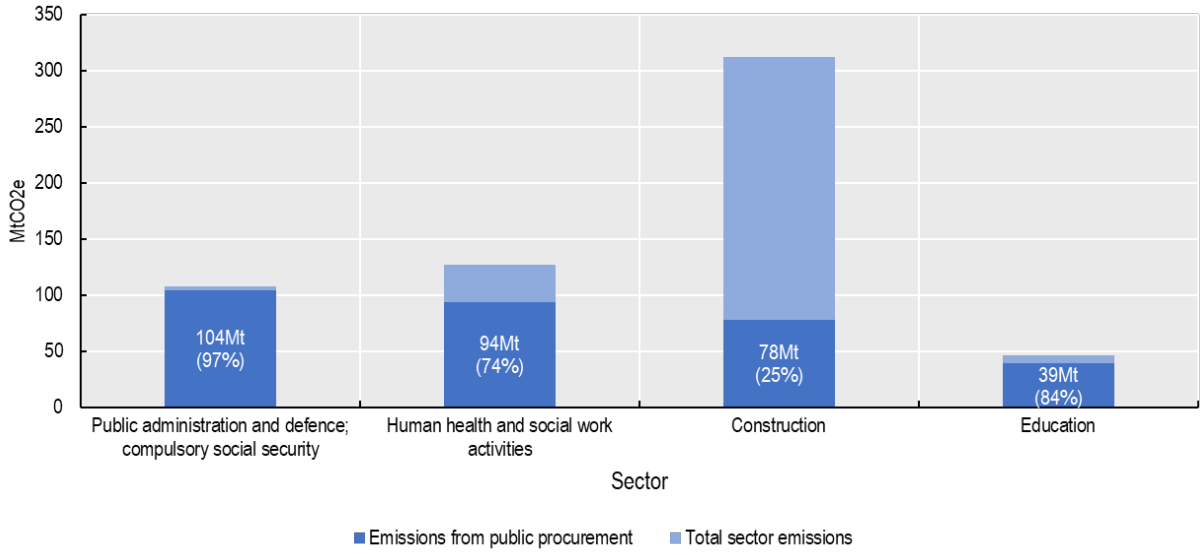
In fact, OECD countries have a longstanding tradition of implementing GPP frameworks in their procurement practices. Namely, 34 out of 38 countries surveyed (89%) by the OECD in 2022 have an active national GPP policy or framework. As such GPP is widely recognised as a powerful tool to achieve climate action goals (OECD, forthcoming[40]).

Creating a market for technologies that drive low emissions infrastructure is vital

The climate transition also relies on implementing new low emissions technologies that drastically decarbonise the infrastructure sector. As reported by the International Energy Agency (IEA), building and construction accounted for 36% of final energy use in 2018 and 39% of energy and process-related CO2 emissions. 11% of these emissions resulted from the production of building materials such as steel, cement and glass (IEA, 2019[41]).

Government spend also has the potential to influence markets indirectly through the "production effect", which refers to spillovers effects in the market that induce changes in production patterns, innovation, creation of new products, etc. in response to rising demand for low emissions goods (Mähönen et al., 2023[42]). The buildings material industry represents a particular case in point, where governments, through their spending, have the potential to catalyse technological innovation that can deliver more low emissions infrastructure. For example, in the EU, emissions from public procurement in the construction sector are estimated at 78Mt and represent 25% of the total emissions of the sector (see Figure 4). The significant share of emissions related to procurement underscores the opportunity for government action.

Figure 4. EU public procurement emissions by sector and as a share of total



Source: (Mähönen et al., 2023[42])

The United States has also recognised opportunities to incentivise low-emissions technologies related to construction materials. Namely, the 2022 Inflation Reduction Act includes funding for reporting on carbon reporting for construction materials, introducing low embodied carbon labelling and using these materials in highways and federal buildings, introducing incentives with low embodied greenhouse gas emissions, as well as acquiring materials and products with low levels of embodied of GHG emissions for government buildings (Stockholm Environment Institute, 2023[43]).

To further strengthen targeted emission reductions linked to public procurement expenditure, governments need better visibility on how much GHG are connected to public procurement. Countries often do not have sufficiently granular data on products and services purchased to be able to compute the overall carbon impact of procurement, and are therefore not able to take GHG-reducing measures. The OECD aims at closing this information gap through the development of a framework to measure the carbon footprint of public procurement strategies.

Finally, governments can also harness innovation for low emissions infrastructure through dedicated procurement mechanisms, such as pre-commercial procurement (PCP) or procurement of innovation (PPI). PCP processes enable research and development by asking the market to deliver innovative goods and services through targeted R&D based on a problem definition. Through PPI, governments can also create a market of innovative solutions that do exist, but are not yet widely available commercially. At EU level, dedicated capacity building projects have been introduced for public officials to use innovation procurement in procuring innovative climate related solutions and services. For instance, the PROTECT project[6] financed by the European Commission aims to enable public authorities throughout Europe to collaborate on joint PCP for using earth observation data to support climate adaptation, mitigation and resilience. Similarly, the Region of Puglia in Italy has piloted innovation procurement approaches to make its water management more effective (OECD, 2021[36]), which is critical in a region increasingly hit by droughts and water shortage.

[6] https://www.protect-pcp.eu/

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