GROWTH THROUGH TRANSFORMATION:
AN INVESTMENT VISION GUIDE FOR CLIMATE AND DEVELOPMENT
About us

ClimateWorks Australia bridges research and action, for system-level transitions to reach net zero emissions across Australia, SouthEast Asia and the Pacific. We act as trusted advisers, influencing powerful decision-makers to reduce emissions at scale. ClimateWorks convenes and facilitates relationships with an international network of organisations that support effective policies, financing and action for emissions reductions.

ClimateWorks supports decision makers with tailored information and tools, working with key stakeholders to remove obstacles and help facilitate conditions that support the transition to a prosperous, net zero emissions future. Co-founded by The Myer Foundation and Monash University in 2009, ClimateWorks is a non-profit working within the Monash Sustainable Development Institute.

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Acronyms

ADB
Asian Development Bank

BAPPENAS
Badan Perencanaan Pembangunan Nasional (Indonesia’s Ministry of National Development Planning)

BAU
Business as usual

CapEx
Capital expenditure

CO₂
Carbon dioxide

CPI
Climate Policy Initiative

CPEIR
Climate Public Expenditure & Institutional Review

DFI
Development Finance Institution

EFCC CIP
Bangladesh Country Investment Plan for Environment, Forestry and Climate Change

ESG
Environment, Social and Governance

ESMAP
Energy Sector Management Assistance Program

ETP
Energy Technology Perspectives

EU
European Union

EV
Electric vehicle

FAO
Food and Agriculture Organization

FDI
Foreign direct investment

GCF
Green Climate Fund

GDP
Gross Domestic Product

GHG
Greenhouse gas

GIZ
Deutsche Gesellschaft für Internationale Zusammenarbeit (German Development Agency)

G20
Group of Twenty (19 countries and the European Union)

ha
Hectares

IADB
Inter-American Development Bank

ICAT
The Initiative for Climate Action Transparency

IDDRi
Institute for Sustainable Development and International Relations

IEA
International Energy Agency

IIIGCC
Institutional Investor Group on Climate Change

ILO
International Labour Organization

IPCC
Intergovernmental Panel on Climate Change

IRENA
International Renewable Energy Agency

kW
Kilowatt

LEAP
Long-range Energy Alternatives Planning system

LTS
Long-term strategy

LEDS
Low emissions development strategy

MCDA
Multi-criteria decision analysis

M&E
Monitoring and Evaluation

Mt
Megatonne

MW
Megawatt

MWh
Megawatt hour

NAP
National Adaptation Plan

NCCC
National Climate Change Committee

NDC
Nationally Determined Contribution to the Paris Agreement on climate change

ODA
Overseas development assistance

ODI
Overseas Development Institute

OECD
Organisation for Economic Co-operation and Development

PCEIR
Private Climate Expenditure and Institutional Review

PFC
Public Finance and Climate Change

PPP
Public private partnership

PV
Photovoltaics

R&D
Research and development

SDG
Sustainable Development Goal

TCFD
Task Force on Climate-related Financial Disclosures

tCO₂e
Tonnes of carbon dioxide equivalent

UK
United Kingdom

UNDP
United Nations Development Programme

UNEP
United Nations Environment Programme

UNFCCC
United Nations Framework Convention on Climate Change

USAID
United States Agency for International Development

WRI
World Resources Institute
Introduction to the Investment Vision Guide

A growing body of evidence identifies low carbon growth as the best approach to sustained, sustainable and inclusive outcomes. This means more than merely quantifying the investment needed for the transformation of a country’s economy in line with the goals of the Paris Agreement and the Intergovernmental Panel on Climate Change Special Report on 1.5 degrees (IPCC 2018). It also requires thinking about the broader context: the structural and social adjustments of the transition, and the policy and economic conditions that make a country ‘investable’ and so steer finance from brown to green. It necessitates consideration of both the risks (so that they can be effectively managed) and the opportunities for green growth that come with the transition.

Achieving the Paris Agreement along with the 2030 Agenda for Sustainable Development requires an estimated investment of US$2.6 trillion each year over the next decade for developing countries alone (Gaspar et al. 2019). This funding gap is small relative to the investable universe of US$200 trillion of tradable stocks and bonds. Lower- and middle-income countries can achieve the sustainable development goals and stay on track to limit climate change to 2°C with smart policies through an investment of 4.5 per cent of the GDP (Rozenberg & Fay 2019).

While an ambitious mid-century climate target in countries’ long-term strategies is an important first step, targets must be translated into policy and investment decisions that attract or redirect investment towards long-term climate and sustainable development objectives. This necessitates a shift from incremental changes in greenhouse gas emissions to the transformational change required by the Paris Agreement and the Sustainable Development Goals. While the widespread benefits of this transformation greatly outweigh the trade-offs, the process requires difficult decisions about key industries and communities.

The unprecedented COVID-19 global pandemic means governments must not only work towards their commitments to the Paris Agreement and the 2030 Agenda, but also manage the significant economic impacts of the pandemic and its impacts on their people.

This guide can be a valuable tool to help governments achieve maximum ‘bang for buck’ with their goals for economic recovery, climate and sustainable development. It can help governments understand which industries and sectors will decline in the future, so that they can minimise disruption from that decline and avoid propping up sectors unnecessarily. It can identify industries that have growth and jobs potential over the coming decade, but that may need support to realise that potential. It can help governments focus on existing projects in their infrastructure pipeline that are highly aligned with both short-term needs and long-term goals, and those that represent a misaligned investment risk. And it can support governments in directing their own finite and thinly stretched resources to unlock additional investment from development finance institutions and the private sector.

We are at a fork in the road. The scale of investment required to reboot and recover economies from the COVID-19 crisis is extraordinary. The direction of this investment will either set us back for decades in our efforts to solve climate change and achieve sustainable development or catapult us forward to a future where economies and people prosper, and where our climate and natural environment are safeguarded.
WHAT IS THE INVESTMENT VISION GUIDE?

Growth through transformation: An investment vision guide for climate and development (referred to as Investment Vision Guide) is a theoretical framework designed to complement efforts by countries to articulate their long-term, low-emissions development strategy (commonly referred to as a ‘long-term strategy’) under the Paris Agreement. It seeks to help governments answer the question: ‘How can we best align policy and investment decisions to achieve a prosperous and climate-safe future for all?’ It draws on best-practice approaches, tools, resources and case studies to illustrate the elements required for climate-safe green growth, assisting in:

+ creating a political context that supports the transition
+ understanding at a granular level how the transition can be achieved and what trade-offs need to be managed
+ ensuring policy and financial systems unlock investment and direct it towards green infrastructure and technologies
+ identifying specific projects that can catalyse the transition this decade, and assessing how they might best be funded.

There are currently many impediments to unlocking the scale of investment needed to achieve the goals of the Paris Agreement alongside development priorities. They include:

+ a disconnect between the long-term trajectory and the range of short- and medium-term plans governments are focused on implementing (such as Nationally Determined Contributions to the Paris Agreement (NDCs), Sustainable Development Goals (SDGs), development plans, and infrastructure, resource and sectoral plans), which leads to policy, budgeting and investment misalignment.
+ lack of agreement on the optimal technical pathways for achieving governments’ long-term development goals (which often prioritise familiar or incumbent technologies) alongside climate action (which may require quite significant deviation from business-as-usual).
+ limited capacity to translate these technical pathways into tangible investment strategies, resulting in an insufficient pipeline of bankable projects.
+ limited financial markets for green technologies and infrastructure, due to risk perceptions about unfamiliar technologies or markets, limited institutional capacity to evaluate projects and structure financing, lack of suitable financing instruments, and underdeveloped local financial markets.

This guide supports governments to address these impediments by outlining a process to:

+ enhance alignment of their own financial resources from national budgets, national development banks and official development assistance with long-term climate and development goals.
+ send clear signals to private and public investors on where finance should (and should not) be directed.
+ ensure an enabling policy and investment context to attract finance where and when it is needed.
+ build a pipeline of investment-ready projects to catalyse the transition.
WHO WILL USE IT?

The Investment Vision Guide supports national governments in developing countries to refocus their economies towards transformational, climate-safe, green growth. In particular, the guide is intended for central ministries with investment and budgeting responsibilities, such as ministries of finance, economic affairs and planning. All activities are, however, best taken in close consultation with relevant line ministries and key stakeholders, and some activities may best be coordinated centrally but delivered by line ministries or even subnational governments. Each country is different and this guide aims to be flexible in accordance with the national context.

While the guide is designed for governments, its outputs can be valuable for investors who play a role in the continuum of capital for developing countries.

FIGURE 1. WHO SHOULD USE THIS GUIDE

INTERGOVERNMENTAL ECONOMIC ORGANISATIONS
+ To help develop country investment plans based on government priorities.
+ To identify risky sectors, and develop de-risking instruments.

INSTITUTIONAL INVESTORS
+ To understand where emerging investment opportunities exist, including using blended finance.
+ To avoid investment risk in declining sectors.
+ To avoid investing in assets that may become stranded.

GOVERNMENTS AND FINANCIAL REGULATORS
+ To inform national and sectoral planning/budgeting and overseas development assistance.
+ To set an enabling environment (e.g. incentives, policy reform, disclosure, citizen acceptance, access to finance, R&D).
+ To provide macro signals and guidance for other public and private investors.

DEVELOPMENT FINANCIAL INSTITUTIONS
+ To help align investment with ‘green mandates’.
+ To identify and integrate climate risks to assets to avoid losses.
+ To pilot de-risking instruments by investing in risky sectors

As the primary user of the guide, governments play an important role in aligning investment with the long-term climate goal, embedding the alignment into national development planning, and creating investment signals to other actors.
How to use this guide

The guide outlines a five-part process to create an enabling environment for green investment and to align public and private sector finance with the long-term goals of the Paris Agreement and governments’ own long-term development objectives.

It presents the parts and activities in a logical sequence. They can, however, be implemented in a different order. The guide outlines a comprehensive process for unlocking finance to achieve transformational change, but recognises that countries may choose to undertake only some parts and activities, based on their capacity and priorities. Ideally, there should also be a degree of iteration between activities, as the experiences gained from later activities can help refine the outputs created as a result of earlier activities.

The guide is designed to be flexible to meet the needs of a broad range of developing countries and avoids being prescriptive as to how activities should be undertaken.

Each activity includes an overview that describes its aims, a suggested approach for the activity, links to resources and tools, recommended outputs and case studies that show how other countries have implemented similar activities.

In using the guide, governments may choose to consider key emissions sectors across the economy at the same time to maximise cross-sectoral opportunities and benefits, or to focus on one sector where significant emissions reductions can be achieved alongside key development outcomes.
This guide should be seen as an iterative tool, and countries should plan to review, assess and update their Investment Vision at regular intervals, in line with reviews of their long-term strategy and Nationally Determined Contribution to the Paris Agreement (NDC). Regular review of decarbonisation pathways may reveal possibilities to achieve deeper emission reductions than previously predicted. For example, as low-carbon technologies become more widely adopted, costs come down and both skills and technologies become more readily available. This can be driven both by domestic market growth and through the spill-over effects of progress between countries (Roeser et al. 2019).

Similarly, adjusting policy creates a different context in which technologies and capital are being deployed, and the effectiveness of these policy adjustments should be regularly assessed and further adjustments made as needed.

Governments should aim to build the sophistication of their Investment Vision over time. Transforming an economy is a complex task and countries should prioritise parts or activities that they feel will bring most benefit. If they identify data or capacity limitations, governments can include these issues in their technical assistance work plan and aim to redress them in later iterations of their Investment Vision.

The guide draws on tools and resources designed for purposes other than long-term decarbonisation planning and investment, where their methodology, evidence or information can be used to support a particular activity.

While both mitigation and adaptation are critical for addressing climate change, in the interests of simplicity, the guide focuses on unlocking finance for mitigation. This acknowledges that many adaptation actions are not ‘investable’ and require direct government or donor support. Where possible, we have flagged as ‘best-practice’ the potential for incorporating adaptation in the activities.
Executive summary

To achieve outcomes in line with both the 2030 Agenda for Sustainable Development and the Paris Agreement, developing countries will require an estimated investment of US$2.6 trillion each year over the next decade.

The Investment Vision Guide supports governments to unlock this investment. It outlines a five-part process to create an enabling environment for green investment and to align public and private sector finance with sustainable development and the goals of the Paris Agreement.

As countries recover from the COVID-19 pandemic, the need to unlock investment is even more acute. For developing countries, enhancing attractiveness for international and private finance will be critical to their economic recovery. Ensuring this investment is aligned to climate and development goals can fast track the transition towards green growth.

The guide presents a theoretical framework to complement efforts by countries to implement the long-term strategies developed under the Paris Agreement. It supports a shift in decision-making, policy design and government budgeting from a focus on incremental emissions reductions to the transformational change required by the climate challenge.

This guide encourages governments to think about investment in the context of the structural and social adjustments necessitated by decarbonisation, assisting them to minimise the inevitable risks and capitalise on the emerging opportunities.

It is particularly suited for central ministries with investment and budgeting responsibilities, such as ministries of finance, economic affairs and planning.

Part One focuses on understanding and strengthening the foundations for success – the political and public conditions on which to build the enabling environment for transformational investment.

Part Two helps governments develop granular perspectives on the transition, generating data on risks and opportunities at a sectoral level so as to facilitate high-quality policy and investment decision-making.

Part Three evaluates the barriers preventing governments and the private sector from deploying low carbon technologies and finance at scale and suggests how these can be overcome.

Part Four details a process for formulating policies to mobilise technologies and markets for the transition ahead and to facilitate the readiness of the financial sector for foreign and domestic investment.

Part Five draws on the analysis undertaken in the previous parts to map out where and how to most effectively deploy public, development and private finance over the coming decade.

Combined, the five parts outline a process for aligning decision-making, policy and public and private investment towards the achievement of the Paris Agreement and the Sustainable Development Goals. Each part contains multiple activities. Parts and activities are described in a logical and cumulative order, but can be deployed in the order that best suits the user.

In the context of the COVID-19 pandemic, the guide offers tools to ensure that the investment associated with the economic recovery facilitates both climate action and sustainable development.
SET THE CONTEXT FOR TRANSFORMATIONAL CHANGE
Part 1: Set the context for transformational change.

Part 1 focuses on understanding and strengthening the foundations for success – the political and public conditions on which to build the enabling environment for transformational investment. The activities in this part are cross-cutting: that is, they require the involvement of multiple agencies. While it is useful to consider the factors discussed here at the start of the process, governments can undertake these activities at any point. Some of them, such as governance and stakeholder engagement, should also be continued throughout the delivery of the Investment Vision.
PART 1, ACTIVITY 1

Empower a cross-ministerial governance structure to lead the process.

OVERVIEW

This activity aims to establish a suitable governance structure and cross-ministerial coordination mechanism to lead the development and implementation of the country’s Investment Vision. The cross-ministerial body could be an existing or built-for-purpose governance structure.

The achievement of sustainable development and climate goals – green growth – requires a high degree of coordination across government. A formal cross-ministerial governance structure is typically seen as the most effective way to achieve this (Elliott et al. 2019). Informal coordination such as ad hoc cabinet and ministerial meetings can, however, also play an important role in supporting more formal mechanisms (Sustainable Governance Indicators 2019).

Building strong and broad political buy-in is key to the success of the transition process. The ideal cross-ministerial governance structure should generate broad ownership by stakeholders and consider impacts on affected groups to maximise development outcomes, promote equity, coordinate key actors and make climate goals a mainstream part of sector planning through laws, policies, or regulations.

The World Resources Institute (Elliott et al. 2019) identified the following key principles that underpin effective cross-ministerial governance:

+ high degree of political leadership
+ supportive institutional arrangements
+ enabling legal frameworks
+ ability to convene the required technical capacity
+ effective engagement with key stakeholder groups
+ transparency and trust in the process.

Vietnam provides a good example of an effective cross-ministerial governance structure, which is illustrated below (see case study for further insights).
FIGURE 3. VIETNAM’S NATIONAL CLIMATE CHANGE COMMITTEE (NCCC) STRUCTURE

Source: Adapted from Ministry of Environment and Natural Resources Management Vietnam 2015
CASE STUDY

VIETNAM’S INTER-MINISTERIAL CLIMATE CHANGE TASK FORCE

In 2012, the Government of Vietnam formed a National Climate Change Committee to strengthen inter-ministerial collaboration for the development of the country’s Intended Nationally Determined Contribution (INDC) to the Paris Agreement. The National Climate Change Committee was established as a new governance structure arrangement, chaired by the prime minister and two vice chairmen: the deputy prime minister and the ministry of natural resources and environment (MONRE). Importantly, the National Climate Change Committee involved representatives from all key ministries, sub-national and local governments, members of civil organisations, National Assembly agencies and experts.

The National Climate Change Committee is the highest-level institutional body in charge of climate change policy and has led, coordinated, harmonised and monitored climate change and green growth program implementation, including international cooperation. The committee advises the government on climate change issues and is tasked with coordinating the development and implementation of the country’s climate policies.

One of the impacts of the National Climate Change Committee on harmonising climate change and green growth implementation is the establishment of a coordinating board to implement the Vietnam Green Growth Strategy, which aims to achieve low carbon growth, greening of production and greening of lifestyles.

Source: Strauch, Rabiou du Pont & Balanowski 2018; Ministry of Environment and Natural Resources Management Vietnam 2015
PART 1, ACTIVITY 1

APPROACH

1. Review any existing work that may have been completed, such as:
   a. mapping of relevant government stakeholders
   b. establishment of existing cross-ministerial governance structures
   c. reviews of existing institutional arrangements and enabling legal frameworks
   d. reviews of existing transparency mechanisms.

2. Consider whether an existing cross-ministerial governance structure could be adapted, built on or tasked with oversight of the Investment Vision development and implementation.

3. If no suitable structure exists, determine which authority is best placed to lead the establishment and oversight of a newly-formed governance body, and identify and recruit key ministries.

4. Ensure the governance structure has strong political endorsement: for example, through direct line of reporting to a head of state.

5. Identify any other key government stakeholders that should work closely with the cross-ministerial governance body and clarify how and when those stakeholders should be consulted.

6. Develop terms of reference, roles and accountabilities, and a workplan for the cross-ministerial governance body to oversee the Investment Vision process.

THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:

+ Cross-ministerial governance structure to oversee the development and implementation of the Investment Vision, with clear governance guidelines, roles and accountabilities.

+ A workplan for the development of the Investment Vision.
**TOOLS & RESOURCES**


  Drawing on country experiences, this paper argues that there are both common and diverse governance and institutional arrangements that can support development and implementation of long-term planning approaches. Provides a comprehensive checklist of key questions to help identify gaps, strengths and opportunities to strengthen such arrangements.


  Discusses the function of inter-ministerial policy coordination and its critical role in governance. It gives case study examples of the application of such principles in Europe and Central Asia.


  While focused on water management and pollution control, the report provides proposals for improving existing, and setting up new, inter-ministerial co-coordinating mechanisms.


  Discusses the benefits of enhanced cross-government coordination, the reasons why governments fail to coordinate more effectively, and how such failures can be addressed.
PART 1, ACTIVITY 2

Enshrine long-term decarbonisation targets in legislation.

OVERVIEW

The long-term policy certainty that comes from enshrining a country’s long-term decarbonisation target in legislation can help address both transition risk exposure and investment risk. It does so by:

+ providing the legal basis for regulatory and policy change
+ establishing legally-binding emissions reduction requirements
+ sending clear long-term signals to businesses, investors and donors on the scale and pace of change
+ facilitating discussion on the costs, challenges and opportunities of the transition.

Embedding the long-term target in law can also safeguard it against changing political cycles, which strengthens policy certainty for investors.

Where it is not possible to create a legal framework for ambitious climate action, governments can use other long-term signalling mechanisms to steer investment. For example, subnational governments can embed climate change considerations into all material decisions of government, as the Australian state of Victoria has shown with its Climate Change Act (State Government of Victoria 2017). Subnational level initiatives such as this can provide the long-term perspective and policy stability needed to drive innovation, investment and action by community and business.

These kinds of signalling opportunities are explored in more detail in subsequent parts in this guide, with discussions of setting or strengthening sectoral emissions reduction targets, embedding climate action into development planning, and strengthening policy and investment signals to better align with the planned transition.
CASE STUDY

UK CLIMATE CHANGE ACT 2008 AMENDMENT 2019 TO REDUCE EMISSIONS BY 100% BY 2050

The UK Climate Change Act was the first legislation in the world to set legally-binding, long-term targets for reducing emissions. The Act was debated and legislated by the UK Parliament, and passed with support from both sides of the House, creating a vital precedent on climate action. It was also widely supported by environmental groups, trade unions and religious groups, which helped to create the political mandate for its introduction.

The UK government is accountable to parliament to deliver the targets included in the Act, and must produce plans to meet five-yearly carbon budgets. If the government fails to fulfil these obligations, it can be subject to judicial review. The Act also requires the UK government to produce a UK Climate Change Risk Assessment every five years, based on input from several government departments, including the Department for Business, Energy and Industry Strategy and the Department for Environment and Rural Affairs.

The Act – and its carbon budgets – have been instrumental in catalysing action on climate change, demonstrating that emissions reductions (particularly in the power sector) are possible and compatible with economic growth.

The Act provides the basis for support across the whole of government for its implementation, including the required reforms to set net zero emissions targets and achieve international climate obligations.

Source: Grantham Research Institute on Climate Change 2018; Norton 2018; Fankhauser Averchenkova & Finnegan 2018.
PART 1, ACTIVITY 2

APPROACH

1. Review any existing work that may have been completed, such as:
   + Mid-century mitigation target or interim targets developed as part of the long-term strategy or NDC process.
   + Stakeholder mapping and engagement plans to determine where ministerial or key stakeholder support may be required to ensure legislation can be passed (mapping is also undertaken in Part 1, Activity 5).

The approach below is drawn from the method taken in legislating the UK’s Climate Change Act (Government of the United Kingdom 2008; Government of the United Kingdom 2019).

2. Set evidence-based targets and ensure they are independently assessed.

3. Design a legally binding pathway to get there, including policies to support achieving targets and how to implement them.

4. Consider mandating the undertaking of climate change risk assessments.

5. Consider mandating reporting requirements from certain organisations.

6. Determine roles and responsibilities for key government departments.

7. Consider establishing an overarching independent climate change advisory body or committee to advise on and scrutinise these matters and monitor and evaluate progress towards targets.

8. Develop an action plan implementing agreed legislative changes.

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THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:
+ Agreed legislative changes to enshrine climate ambition.
+ Action plan for implementing these changes.
**TOOLS & RESOURCES**

+ **10 years of the UK Climate Change Act**, Fankhauser et al. 2018.

This report summarises lessons from the Act that can be applied internationally on how to best structure climate change lawmaking to be effective. Based on interviews with UK policy and climate governance experts, it highlights what procedural, institutional and legislative arrangements have been successful, along with political challenges and roadblocks inhibiting implementation of the Act.

+ **Aligning national and international climate targets**, London School of Economics 2018.

Compares the quantified targets in countries’ NDCs to the Paris Agreement and those in national laws and policies. Key findings highlight the importance for national governments in introducing targets into laws and policies.


Provides a summary of ‘net zero by 2050’ pledges by national governments and names those countries that have pledges passed in law, proposed in legislation, in policy documents or in discussion.


This database covers climate and climate-related laws, as well as laws and policies promoting low carbon transitions. It reflects the relevance of climate policy in areas including energy, transport, land use and climate resilience.
PART 1, ACTIVITY 3

Identify areas of alignment with short-medium- and long-term development planning.

OVERVIEW

“Action on climate change can generate inclusive economic growth in the short term, in addition to securing longer-term growth and well-being for all citizens. Governments can not only build strong growth but also avoid future economic damage from climate change if they collectively act for a ‘decisive transition’ towards low carbon economies”

(OECD 2017, p. 19)

This activity considers how a country’s long-term climate targets align with short- medium- and long-term development objectives to enhance coherence between climate and development objectives.

Development planning typically happens in cycles. Understanding where synergies exist can inform prioritisation of climate actions and identify opportunities to better embed climate objectives in development planning as part of the future planning cycle. This ensures that climate action is embedded or ‘mainstreamed’ into the development planning process.

ROLE OF NATIONAL DEVELOPMENT PLANS

Medium-term – typically five-year – development plans are a powerful planning practice commonly used in many countries including in emerging markets such as China, Indonesia and India. Such plans often include environmental and social mandates as well as specific climate targets.

The Indonesian Medium-term Development Plan 2015–2019, for example, includes objectives to develop rural and remote areas, eradicate illegal logging, increase community participation in forest management, reduce emissions for five priority sectors including forestry and peatlands, and increase community resilience to the impacts of climate change in fifteen vulnerable areas (LSE 2015).

This information can be useful in signalling to donors and investors which sectors (for mitigation) and geographic areas (for adaptation) the government has prioritised.

It is also critical to integrate measures addressing climate change into development processes at various levels – project, local, sectoral and national (OECD 2010).
CASE STUDY

COSTA RICA’S DECARBONISATION PLAN 2050

Costa Rica’s Decarbonisation Plan 2050 shows the opportunity is greatest when climate action is part of long-term development planning. The Decarbonisation Plan serves as a blueprint for integration of climate considerations into long-term development planning, based on a paradigm of transformational, rather than incremental, change.

The plan describes a three-phase approach to achieve transformation:

1. Foundation (2018-22): Launching the process of long-term sectoral planning, identifying urgent actions to establish an enabling environment and considering the potential impacts of short-term decision-making on long-term decarbonisation goals.

2. Inflection (2023-30): Developing best-practice, detailed plans at the sectoral level, implementing substantive interventions to shift the national trajectory towards net zero emissions and implementing additional institutional changes to address barriers.

3. Massive deployment (2031-50): Reinforcing change so that it becomes mainstream, refining strategies to reflect socio-technical and market changes and promoting opportunities for zero emissions technologies in newly formed markets.

The plan includes 10 decarbonisation focus areas with targets across the three phases. Policy packages combine concrete planning, institution/regulatory measures, project implementation, access to finance, citizen acceptance and avoiding emissions lock-in. These are supported by eight cross-cutting strategies that seek to address the social, financial, environmental and technological considerations of transformational change.

The transport sector provides a specific example. The Decarbonisation Plan aims to modernise public transport, including the creation of an electric train line and cutting by half the number of cars circulating in urban areas by 2040. It projects that by 2035, 70% of the country’s buses and 25% of cars will be electric. To phase out fossil fuels without slashing government income, the government needs to push for ‘green tax reform’ to find new revenue sources, which requires legislative approval. Under the plan, the country’s state-owned petroleum distributor will change course and begin research on alternative fuels, such as hydrogen and biofuels, as well as helping fossil fuel workers move to clean energy jobs in the longer term.

Source: Government of Costa Rica 2018
CASE STUDY

INDONESIA’S LOW CARBON DEVELOPMENT INITIATIVE

In October 2017, the Government of Indonesia declared its goal of integrating climate action into the country’s development agenda. The Low Carbon Development Initiative (LCDI) was launched in 2019 by Indonesia’s Ministry of National Development Planning (BAPPENAS) and will be included in the upcoming National Medium-Term Development Plan (RPJMN) 2020–2024. Low Carbon Development Initiative policies will be implemented to achieve the ‘Vision of Indonesia 2045’, which aims to achieve a sovereign, advanced, fair and prosperous nation by its centenary in 2045.

The Low Carbon Development Initiative estimates that under the Business As Usual (BAU) scenario with no new policies and ongoing environmental degradation, Indonesia’s economic growth will decline from around 5.2% in 2019 to 4.3% in 2045. In contrast, under the Low Carbon Development Initiative High Scenario (which includes more ambitious policy measures for 2020–45 and achieves Indonesia’s conditional NDC target), GDP growth will peak at 6.6% by 2035 and slow to 5.8% by 2045. The stronger GDP growth in the High Scenario is estimated to yield an extra US$5.4 trillion by 2045.

In addition, when the two scenarios are compared, the High Scenario outperforms BAU in many other socio-economic indicators, with:

+ 40,000 deaths avoided each year
+ extreme poverty at 4.2% of population
+ the creation of 15.3 million additional jobs that are greener and better paid
+ the prevention of the loss of nearly 16 million hectares of forest
+ improved air quality
+ improved living conditions
+ closing of gender/regional opportunity gaps
+ lower investment-to-GDP ratio.

Source: Bappenas 2019
PART 1, ACTIVITY 3

APPROACH

1. Draw on any existing work that may have been completed, such as:
   + national development plans (short, medium, long term)
   + socio-economic or development targets and indicators
   + long-term climate strategy socio-economic indicators over time across different scenarios (such as changes in GDP, jobs or indicators of poverty or income equality).

2. Review the country’s medium and long-term development planning to identify areas of potential alignment with the long-term strategy. This could use socio-economic indicators common across measures such as GDP, jobs, per capita income, energy demand and access.

3. Map long-term climate strategy socio-economic indicators against development targets and indicators.

4. Review ministries’ strategic planning documents to collate information on programs and actions proposed by the ministries to achieve development targets and identify areas of potential alignment with the long-term strategy.

5. Assess opportunities for strengthening climate outcomes in development planning, in areas of potential alignment with the long-term strategy.

6. Where possible, embed these opportunities into future development planning cycles to better capture synergies between climate and development outcomes.

THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:

+ High-level mapping of long-term climate strategy socio-economic indicators against national development targets and indicators, for input to Part 2, Activity 4 (Align with SDGs).
+ Summary of national development priorities to inform Part 2, Activity 6 (prioritise actions).
TOOLS & RESOURCES

+ **Scaling up ambition: Leveraging NDCs and long-term strategies to achieve the Paris Agreement goals,** WRI and UNDP 2019 (p.12-14).

This paper highlights the critical role of NDCs and long-term strategies in advancing the G20 (The Group of Twenty) goal of strong, sustainable, balanced and inclusive growth, and the benefits from undertaking near-medium- and long-term planning processes in tandem. It also specifically explains how long-term strategies can guide short-term political and economic cycles and provide certainty for key economic actors to take concrete action.

+ **Accelerating climate action: Refocusing policies through a well-being lens,** OECD, 2019.

Analyses synergies and trade-offs between climate change mitigation and broader goals such as health, education, jobs, wider environmental quality and the resources needed to sustain livelihoods. Focuses on five economic sectors (electricity, heavy industry, residential, surface transport and agriculture) that are key for decarbonisation.

+ **Aligning near- and long-term planning in Vietnam to meet the goals of the Paris Agreement,** WRI n.d.

This expert perspective presents Vietnam’s experience in aligning near-term climate and development planning to inform long-term climate planning, highlighting overall benefits and priority focus areas as well as challenges and resource constraints. It provides recommendations for streamlining planning and identifies focal points in each ministry responsible for facilitating integration.

+ **Aligning climate finance to the effective implementation of NDCs and to LTSs,** UNEP 2018.

Proposes mechanisms to improve the alignment of international climate finance with national priorities for the implementation of NDCs.

+ **Consolidation of climate planning processes in the energy community contracting parties,** New Climate Institute (NCI) 2019.

This guidance document provides contracting parties in the energy community with concise and simple guidance on how they can align and consolidate climate change policies such as long-term strategy and NDCs with energy planning and development processes such as national energy sector strategies.
PART 1, ACTIVITY 4

Map existing climate finance flows.

OVERVIEW

The aim of this activity is to analyse sources of domestic and international climate finance and assess how they are distributed nationally in order to integrate climate change into budgeting and planning processes (UNDP 2015). This provides a baseline against which investment need (Part 2, Activity 2) can be evaluated to help governments understand where effort should be focused on unlocking increased climate finance flows. Ideally, analysis should consider both international climate finance flows and national public expenditures.

A range of barriers make tracking climate finance difficult, in particular (Torvanger et al. 2019):

+ A lack of consensus on what can be defined as ‘climate finance’: Although there is no single right answer, clearer definitions and greater transparency on definitions, methods and assumptions will help avoid omissions and double counting (Tirpak, Brown & Ballesteros 2014).

+ Data availability and quality: Given there are multiple sources of funding across a range of sectors, building a complete, up-to-date and accurate data set for climate finance is a challenge requiring input from line ministries, local governments and the private sector.

+ Attribution, impact reporting and verification: There are variations in how climate finance is defined and reported, and how finance is distributed across multiple sectors and tiers of government. This highlights the need for a single agency at the national level, focused on collecting and processing data on climate finance flows.

A further benefit, therefore, of mapping climate finance can be to identify gaps in definition, in finance tracking mechanisms, and in technical capabilities. This can provide crucial recommendations on improving tracking, as the Indonesian example demonstrates in Part 1, Activity 3 (CPI 2014).

Mapping all finance flows also helps to identify and address bottlenecks in finance flows, making financing consistent and clearing the pathway for achieving low greenhouse gas and climate resilient development.

There are, however, currently no internationally agreed approaches to tracking the consistency of finance flows with climate objectives. While the data required to undertake this analysis may not be readily available, the development of such mechanisms would help to determine whether finance contributes to, undermines, or has no impact on these objectives (Jachnik, Mirabile & Dobrinevski 2019).
CASE STUDY

MEASURING PRIVATE INVESTMENT FOR GREEN GROWTH IN VIETNAM

The Ministry of Planning and Investment (MPI) initiated the Private Climate Expenditure and Investment Review (PCEIR) in 2017–18 to track the climate change mitigation and green growth investments made by the private sector in the 2010–15 period. This has helped to refine anticipated investment need across key economic sectors, as illustrated in Table 1 below.

To ensure success, the following elements were incorporated:

+ ALIGNMENT WITH NATIONAL FRAMEWORKS:
The Private Climate Expenditure and Institutional Review was initiated to complement Vietnam’s Climate Public Expenditure and Institutional Review (CPEIR), which was not capturing mitigation-related investments by the private sector, even though these made up the majority of climate-related investment. This informed a review of existing climate finance instruments and enhancement of Vietnam’s Green Finance Policy Framework to encourage green credit programs and green bond projects.

+ TECHNICAL FEASIBILITY/NEEDS EVALUATION:
Technical workshops on private climate expenditure and institutional tracking were conducted, along with interviews for collection and verification of data. Identified data gaps were addressed with investors and state-owned enterprises consulted to determine investment values based on unit price of typical investments.

+ COMPREHENSIVE AND MEANINGFUL ASSESSMENT TO SUPPORT PLANNING FOR FUTURE INTERVENTIONS:
The review assessed the investment need to meet the proposed renewable energy and energy efficiency targets. This helped the government to understand the scale of private climate finance investments already made and the amount required to meet national targets. It also guided recommendations to better align existing financial instruments and schemes to encourage and mobilise climate finance from potential private sector investors.

TABLE 1: PRIVATE SECTOR INVESTMENT NEED AND INVESTMENTS MADE FOR GREEN GROWTH IN SELECTED INDUSTRIES

<table>
<thead>
<tr>
<th>INDUSTRIAL SECTOR</th>
<th>OVERALL INVESTMENT NEED (MILLION US$)</th>
<th>ESTIMATED INVESTMENTS MADE IN THE PERIOD 2010-2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron and Steel</td>
<td>450.0</td>
<td>169.9</td>
</tr>
<tr>
<td>Cement</td>
<td>650.0</td>
<td>-</td>
</tr>
<tr>
<td>Pulp and Paper</td>
<td>306.0</td>
<td>104.5</td>
</tr>
<tr>
<td>Sugar</td>
<td>360.0</td>
<td>127</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,766</strong></td>
<td><strong>401.7</strong></td>
</tr>
</tbody>
</table>

**APPROACH**

The United Nations Development Programme has developed several methodologies that can support mapping of existing finance flows:

1. An investment and financial flows assessment (I&FF) creates a baseline of existing expenditures at the sectoral scale and identifies gaps in priority climate-related activities.


3. A private sector climate expenditure and institutional review (PCEIR) provides an assessment of the use of public sector funds to alter the return profile of individual investments, rather than to meet the full cost of mitigation activities, in order to leverage private sector investment.

4. Alternative approaches include mapping the landscape of climate finance using a methodology suggested by Climate Policy Initiative (Buchner et al. 2019) or the Institute for Climate Economics (I4CE). Both methodologies map the climate finance landscape at a country level using project level financing, government expenditure and gross fixed capital formation. Developing countries may have to adjust the methodology according to data availability. See tools and resources below for links to these methodologies.

**THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:**

+ Country level climate finance mapping to provide an overview of finance flows, key actors and financial instruments currently being used.

+ Overview of the national climate finance tracking system, its gaps and opportunities to improve. This can be a useful tool to strengthen dialogue and collaboration among key ministries.

**AREAS FOR FURTHER WORK**

While methodologies and tools are emerging to support climate finance and budget tracking, there remain challenges in tracking the consistency of overall finance flows with climate objectives – that is, whether finance contributes to, undermines, or has no impact on these objectives (Jachnik, Mirabile & Dobrinevski 2019). This remains an important gap, as the challenge in addressing climate change is not just to scale up climate finance, but to ensure that all finance flows are consistent with (or at least do not undermine) the goals of the Paris Agreement.
TOOLS & RESOURCES

+ **Climate public expenditure and institutional review (CPEIR) – A methodological guidebook**
  UNDP 2015.
  Provides a step-by-step guide to the processes, methodologies and tools for relevant stakeholders to conduct a CPEIR.

+ **Private climate expenditure and institutional review (PCEIR)**
  UNDP 2015.
  Similar to CPEIR, the Private Climate Expenditure and Institutional Review is an analysis of a country’s private expenditures related to climate change. The methodology can be used for decision making on the use of public funds to incentivise private sector investment.

+ **Investment and financial flows assessment (I&FF)**
  UNDP n.d.
  As part of the I&FF methodology, countries assess expected costs for climate mitigation and adaptation measures against a baseline of current activities. This helps to identify sector-specific investment requirements and create a financial needs roadmap.

+ **Knowing what you spend: A guidance note for governments to track climate finance in their budgets**
  UNDP 2019.
  Supports government agencies responsible for climate finance in setting up a Climate Budget Tagging (CBT) system or strengthening an existing one.

+ **Global landscape of climate finance 2019**
  Provides the latest figures on climate finance and the latest CPI methodology for tracking climate finance at the international level.

+ **Low-carbon investment 2011-2017**
  Presents an overview of I4CE’s work and methodology in tracking domestic climate investment and finance flows in France since 2012. The report highlights the benefits of identifying the gap between current levels of investment and the estimated investment to achieve climate objectives and generate awareness and engagement with national stakeholders.

+ **Landscape of climate finance in France 2019**
  Institute for Climate Economics (I4CE) 2019.
  The report presents the annual results of I4CE’s work in France, providing an overview of the investments made by governments, households and businesses in support of the French government’s climate-related objectives. It presents new work on identifying investment needs to achieve national climate goals, and provides estimates of counterproductive or non-aligned flows, as well as initial financing scenarios for how investment gaps could be closed.

+ **Domestic landscape of climate finance: Why a systemic approach to climate finance matters?**
  Draws on ongoing work by Wise Europa, I4CE and NewClimate Institute to detail how tracking domestic climate finance can support policy making in countries such as Poland.

+ **Research collaborative: Tracking finance for climate action**
  OECD n.d.
  Led by the OECD it is designed as a platform to help identify research priorities and gaps.

+ **The state of tracking financial flows under the Paris Agreement: A primer for policy makers in India**
  CICERO Center for International Climate Research and TERI 2019.
  Describes a range of issues and challenges in tracking climate finance and outlines recommendations for improvements. While the report uses India as a case study, the overall findings and recommendations are broadly applicable.
PART 1, ACTIVITY 5

Evaluate needs for technical assistance.

OVERVIEW

This activity assesses the technical capacity a country has in place domestically to support the Investment Vision process. It predicts future capacity needs, identifies gaps and provides recommendations for where technical assistance may be required to address any constraints.

Effective institutions are at the centre of a country’s readiness to successfully implement the Investment Vision. For many developing countries, however, domestic resources may be limited and government officials overburdened with existing planning responsibilities.

This activity first entails understanding the level of current capacity. Once a baseline has been set, a needs assessment can identify gaps in capacity where policy and technical assistance can help to enhance critical functions. These gaps could include (Dany, Bowen & Miller 2015; UNFCCC 2015):

+ technology transfer
+ knowledge management, information sharing and collaboration between stakeholders
+ governance
+ data quality and availability, analysis and modelling
+ planning and resourcing (including human and financial resources as well as monitoring and evaluation).

Key characteristics of a good capacity needs assessment process include (USAID 2016; UNDP 2008):

+ engaging stakeholders early and iteratively throughout the process
+ an externally facilitated evaluation conducted at the relevant level (national or subnational)
+ an evidence-based process, enabling independent review
+ a partner-led and demand-driven process.
+ support that is tailored to be relevant for each country.
+ embedding evaluation of any technical assistance.
CASE STUDY

ENHANCING CAPACITY TO IMPLEMENT NATIONAL CLIMATE CHANGE POLICY IN NEPAL

Nepal launched its Climate Change Policy in 2011 to improve livelihoods by mitigating and adapting to climate change, adopting a low carbon emissions socio-economic development path, and supporting and collaborating on the country’s commitments to national and international agreements related to climate change.

In 2012, the government established the Nepal Climate Change Support Programme (NCCSP) with funding from the United Kingdom Department for International Development (DFID) and the European Union (EU). The program was designed to run for a period of four years from January 2012 to December 2015, to enhance the capacity of government and non-government institutions to implement the Nepal Climate Change Policy 2011.

To launch the program, Nepal conducted a detailed capacity needs assessment at the central, regional, district and village levels. At the central level, the assessment involved engagement with government ministries and other institutions and the review of documents. This delivered the National Capacity Needs Self-Assessment (NCSA), which included a national capacity strategy and action plan for enhancing human and institutional capacity.

At the regional, district and village levels the assessment focused on existing capacity in the delivery of services to develop a capacity development plan for government and non-government institutions. The assessments pointed towards the need for a long-term vision on climate change and for building adequate capacity to access and manage multiple forms of climate change finance.

Source: UNFCCC LDC Expert Group 2015
**APPROACH**

The following approach has been adapted from the United States Agency for International Development’s (USAID) Institutional Capacity Assessment Tool (2016) and United Nations Development Programme Capacity Assessment Methodology User’s Guide (2008).

1. Define the goals, objectives and expected results of capacity assessment in collaboration with relevant stakeholders.
2. Draw on any existing work, such as:
   + Capacity or technical needs assessments.
   + Standard indicators related to institutional capacity.
3. Determine the approach to data and information collection and analysis.
4. Develop or adapt indicators, targets and baselines related to institutional capacity.
5. Identify partner organisations to support or undertake capacity assessment.
6. Identify the focus areas and core functional capabilities relevant to the Investment Vision process to be assessed. Some examples include technical capacity; knowledge and information sharing; data collection, analysis and modelling; institutional strengthening; policy evaluation and design; project identification and assessment; climate finance and financial instruments.
7. Undertake capacity assessment and analyse the results.
8. Develop a capacity-strengthening plan for priority needs.
9. Engage suitable partner organisations to provide technical and financial support for the capacity strengthening process.
10. Design a monitoring, evaluation and reporting process to assess the outcomes and impacts.

**AREAS FOR FURTHER WORK**

Although a range of tools and resources have been identified to guide this activity, there is no common theory or framework on how technical assistance needs should be evaluated nor how to measure change resulting from international assistance (Dixit et al. 2012).

**THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:**

+ Needs assessment scored on an overall basis as well as by relevant focus areas.
+ Capacity strengthening plan that includes a prioritisation of needs, timeline, staff responsible, activities and potential collaborators who could provide funding or technical assistance.
+ Measurement, evaluation and reporting plan.
TOOLS & RESOURCES

+ **Global climate change institutional capacity assessment**
  USAID 2016.
  A structured tool for assessing an organisation or institution’s capacity to address climate change issues. It can be used as a baseline assessment tool to guide technical assistance and enable an evaluation of impact at a later date. It can also be used as a performance-monitoring tool to document progress.

+ **Capacity assessment methodology user’s guide**
  UNDP 2008.

+ **Capacity building for sustainable development**
  UNEP 2002.
  Provides an overview of the United Nations Environment Programme’s capacity-building initiatives for environmental and sustainable development. The guide can be used to identify where the United Nations Environment Programme can provide support for developing and strengthening legal instruments and institutional infrastructures, as well as integrating economic development and environmental protection.

+ **The capacity development results framework**
  World Bank Institute 2009.
  Provides tools and processes to address common problems in capacity building for development. The framework can be used as a step-by-step guide in the identification, design, implementation and evaluation of projects and programs at both a national and subnational level.

+ **Capacity development needs diagnostics for renewable energy (CADRE) toolbox**
  IRENA, NREL & GIZ 2012.
  Although focused on capacity development for renewable energy, the capacity assessment framework can be applied to other forms of sustainable development.

+ **The role of technical assistance in mobilising climate finance: Insights from GIZ programs**
  Climate policy initiative (CPI) 2015.
  Few studies look at the role of technical assistance in mobilising investment for climate action. This paper provides some first insights on the topic by analysing five technical assistance programs from one of the largest technical assistance agencies worldwide, the German Gesellschaft fuer Internationale Zusammenarbeit (GIZ).
PART 1, ACTIVITY 6

Develop stakeholder engagement and communications plan.

OVERVIEW

This activity aims to identify key stakeholders and to establish how and when to engage them. This informs the development of an engagement and communications plan, which can be used throughout the process of developing the Investment Vision.

Stakeholder analysis and engagement planning are key tools to support understanding of the broad range of stakeholder groups relevant to the Investment Vision process, along with their interests, challenges and priorities. Any organisations, institutions or individuals who have a stake in the Investment Vision process or who may be affected by its implementation should be included, with an assessment of the significance of each stakeholder to a successful outcome.

Effective stakeholder engagement should be iterative throughout the Investment Vision process. Stakeholder engagement should factor in a high level of participation from key stakeholders in all phases of the design, implementation and assessment of the process (ICAT 2018). This participation will help to build trust, ownership and consensus.

Understanding the wide range of interests, motivations and levels of influence of diverse stakeholders can help to make the transition more inclusive, transparent, legitimate and sustainable. It can also help decision-makers to identify and more effectively support the transition for vulnerable regions, communities and industries. Further, an improved understanding of aligned and divergent interests can help governments design policies that address multiple needs and foster broad support of ambitious action (OECD 2017).

Note however that stakeholder engagement does not displace the need for direct assistance to support retraining or direct job transfer for workers in fossil fuel sectors (Sartor 2018). This is explored in more detail in Part 4, Activity 3.
CASE STUDY

SOUTH AFRICA’S ‘LET’S RESPOND TOOLKIT’

The ‘Let’s Respond Toolkit’ is an example of how web-based platforms can be used for sharing information between different levels of government, and with non-governmental stakeholders. The toolkit provides key information to support stakeholder engagement in adaptation planning, including draft municipal climate change plans that are open for public comment, and information on past and upcoming stakeholder workshops held throughout the planning process.

While a lack of literacy or Internet access prevents some individuals or groups from accessing its information, the toolkit is a good starting point for informing stakeholders about what is occurring and creating opportunities to provide input. By making information and documents available across provinces and municipalities, the platform offers users in different jurisdictions the opportunity to learn from each other.

Source: Dazé 2017

STAKEHOLDER ENGAGEMENT IN CALIFORNIA

California’s successful climate policies are set against a background of strong political and public support for environmental protection, long-term planning, analytical evaluations and modelling, and an inclusive stakeholder process that helps shape long-term plans and individual climate policies. The process outlines the role of different state actors, as well as the policy and planning methods employed by the state. Through this well-formulated public stakeholder process and discussions with numerous state and local agencies, California has been able to adopt some of the most ambitious climate policies in the world, while regularly using a ‘scoping plan’ to inform new laws and regulations.

Source: Kessler and Sahota 2019
APPROACH

According to best-practice (ICAT 2018 & ClimateWorks Australia 2018), the stakeholder consultation process should:

1. Identify and understand key stakeholders. Undertake stakeholder analysis and mapping to identify key stakeholder groups, their significance and expected interest (or ‘stake’) in the process, and their legitimate representatives. The process may draw from stakeholder analysis done as part of the long-term strategy, NDC or development planning processes.

2. Develop a stakeholder engagement and communications plan. Use information gathered above to identify objectives of engagement and key messages for each stakeholder group, then develop an engagement and communications plan to achieve these objectives. The plan should consider potential barriers to participation and grievance redress mechanisms.

THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:

- Stakeholder analysis, engagement and communications plan for implementation across subsequent parts and activities.
- Identification of sectors, regions and communities most vulnerable to the transition, to inform Part 2, Activity 5 (Assess risks and opportunities) and Part 4, Activity 3 (Formulate transition measures for emissions-intensive, trade-exposed regions and industries).
TOOLS & RESOURCES

- **Stakeholder participation guidance**
  Initiative for Climate Action Transparency (ICAT) 2018.
  This document helps countries enhance stakeholder participation in the design, implementation and assessment of climate policies and actions.

- **Five-step approach to stakeholder engagement**
  This report provides a comprehensive toolkit that incorporates the latest thinking on stakeholder engagement best-practice in a five-step approach.

- **Tools for development**
  Chapter 2. Stakeholder Analysis details a comprehensive approach to stakeholder analysis.

- **ROMA: A guide to policy engagement and influence**
  Overseas Development Institute (ODI) n.d.
  Outlines a step-by-step process to build a stakeholder engagement strategy.

- **Horizon to horizon**
  ClimateWorks Australia, 2018.
  A guide to support Pacific Island nations to design and implement a long-term strategy.
  Part 2 outlines an approach to stakeholder analysis and engagement planning.
PART 1, ACTIVITY 7

Monitor, evaluate, iterate.

OVERVIEW

Monitoring and evaluation (M&E) is crucial for tracking the progress, efficiency and effectiveness of actions to implement the Investment Vision and for informing revisions where necessary. Monitoring and evaluation plans can also include a risk register to regularly monitor critical risks and assumptions.

Monitoring and evaluation provides a useful evidence base to inform regular review and update of the Investment Vision. Reviewing a country’s Investment Vision should ideally be done as part of a holistic process that draws from and informs updates to its NDC and long-term strategy, ensuring consistency between these processes. For example, the reassessment of decarbonisation pathways as part of long-term strategy and NDC review may reveal that it is possible to achieve deeper emission reductions than previously thought. This can occur, for example, when tipping points for the mass diffusion of technologies and practices are reached (Roese et al. 2019), which can lead to lower costs and the increased availability and range of low carbon technologies. Similarly, changes in energy supply and demand forecasts, climate scenarios and stakeholder priorities will also have implications for the scale and pace of transition in different sectors (Rocha & Falduto 2019). This in turn, will have implications for policy, financial sector regulations and investment priorities that are a key focus of the Investment Vision.

The monitoring and evaluation and revision processes should be participatory, striving to include, consult and communicate with key stakeholders. Successes should also be celebrated and shared, along with lessons learned from interventions that fail to deliver.
CASE STUDY

KENYA’S ADAPTATION MONITORING AND EVALUATION SYSTEM

The design of Kenya’s monitoring and evaluation (M&E) system considers the country’s climate change policy context and priority adaptation actions, and proposes next steps. Although it is an adaptation monitoring and evaluation system, the guiding principles and implementation steps are also relevant for mitigation.

The following principles are established to guide the monitoring and evaluation design based on challenges and opportunities identified through stakeholder consultation:

+ A simple, integrated and multi-level monitoring and evaluation system should be developed. The system should be aligned to the national monitoring and evaluation systems and data collection through designated government agencies. The monitoring and evaluation systems should be sustainable, considering available human, technical and financial resources.

+ Ensure the monitoring and evaluation system is sufficiently flexible to enable compliance with domestic and international regulations. It should support the communications required by the United Nations Framework Convention on Climate Change (UNFCCC), as well as the reporting required by the parliament.

+ The monitoring and evaluation system should be developed in a phased approach. The monitoring and evaluation system should focus on priority sectors and ensure identification of measurable indicators.

+ The monitoring and evaluation system should be used to demonstrate that climate change actions deliver results. Build in assessment to ensure actions are increasing resilience.

Once design of the monitoring and evaluation system is completed, implementation is phased over five steps to allow the system to grow in complexity and reach.

1. Establish governance and coordination mechanisms for monitoring and evaluation.
2. Identify measurable indicators and harmonise with existing monitoring and evaluation processes.
3. Establish guidelines and build capacity for reporting.
4. Build on established monitoring and evaluation systems at the county level.
5. Link the adaptation monitoring and evaluation system with national and county monitoring and evaluation systems.

Source: Mutimba et al. 2019
PART 1, ACTIVITY 7

APPROACH

1. Identify existing monitoring and evaluation mechanisms and revision processes and potential alignments. These could include:
   - Existing monitoring and evaluation mechanisms developed as part of national communications, NDCs, Sustainable Development Goals, national voluntary reporting mechanism, or reporting on development planning processes.
   - Existing revision processes for NDCs, long-term strategy, or national development planning.

2. Identify suitable monitoring indicators to measure progress of implementation of the Investment Vision. These should be SMART (Specific, Measurable, Achievable, Relevant and Timebound) and be linked to emissions reduction targets and investment outcomes to ensure the monitoring process is practical (Rocha & Falduto 2019).

3. Determine an approach to data and information collection.

4. Create a monitoring and evaluation plan that details the process, milestones, roles and responsibilities. As needed, incorporate technical assistance requirements into Part 1, Activity 5 (Evaluate needs for technical assistance).

5. Analyse and communicate results.

6. A risks register can also be developed alongside the monitoring and evaluation plan, outlining risks, assumptions and approaches to managing and mitigating those risks.

7. Develop a plan for regular review and update of the Investment Vision, taking into account lessons from the monitoring and evaluation process.

Source: Adapted from Rocha & Falduto 2019; GermanWatch 2019

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THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:

- Monitoring and evaluation plan.
- Timeline for iteration and revision of the Investment Vision (ideally to coincide with updates to the long-term strategy).
TOOLS & RESOURCES

+ **Public climate finance: A survey of systems to monitor and evaluate climate finance effectiveness**
  Climate Policy Initiative 2012.
  Examines the monitoring and evaluation frameworks applied by eight multilateral and bilateral intermediaries including the Asian Development Bank, World Bank, the Global Environment Fund, Climate Investment Funds, Agence Française de Développement (AFD) and the UNFCCC reporting framework.

+ **Monitoring and evaluation framework**
  Australia Indonesia Partnership for Economic Governance, Australian Department of Foreign Affairs and Trade (DFAT) 2017.
  Based on DFAT monitoring and evaluation standards, this framework includes tools and templates for activity-level monitoring purposes, with the aim of tracking efforts to achieve strong, sustainable and inclusive economic growth in Indonesia in a way that is efficient, effective and long-lasting.

+ **Monitoring and evaluation framework**
  NAMA Facility 2018.
  Provides guidance on setting up an indicator-based monitoring and evaluation scheme that creates a transparent and systematic approach to gathering and assessing knowledge. Although specific to Nationally Appropriate Mitigation Actions Support Projects (NAMA-NSP), the overall theory of change of the NAMA Facility is strongly aligned with the Investment Vision Guide to support transformational change and leverage financing for low carbon development and its indicators can be adapted to suit.

+ **Key questions guiding the process of setting up long-term low emissions development strategies**
  Chapter 3 outlines recommended plans for monitoring progress and assessing results of long-term low emissions and development strategies (LT-LEDS).
IDENTIFY SECTORAL TRANSFORMATION PATHWAYS, THEIR IMPACTS, AND PRIORITIES FOR ACTION

ACTIVITY 1:
Describe long-term sectoral decarbonisation pathways
Tools and resources

ACTIVITY 2:
Estimate investment need over time
Tools and resources

ACTIVITY 3:
Align sectoral decarbonisation pathways and Nationally Determined Contributions (NDCs)
Tools and resources

ACTIVITY 4:
Link sectoral decarbonisation pathways to Sustainable Development Goals (SDGs)
Tools and resources

ACTIVITY 5:
Consider long-term risks and opportunities
Tools and resources

ACTIVITY 6:
Prioritise actions
Tools and resources
Part 2: Identify sectoral transformation pathways, their impacts, and priorities for action.

‘Planning the decarbonisation of the economy requires a balance between the long-term vision and immediate actions.’ (Government of Costa Rica 2018, p. 3).

A country’s long-term strategy will provide an overarching picture of the transition that is needed at a national level to achieve the Paris Agreement goals. Part 2 focuses on creating a more granular picture of that transformation at a sectoral level, including an assessment of the costs, development benefits, risks and opportunities. The data created in this part is key to high-quality policy and investment decision-making.

By thinking through different aspects of the transformation, governments can prioritise short- and medium-term actions and plan an effective and orderly transition. They can then focus on setting the conditions for success and unlocking investment where it is most needed over the coming decade.

Given the focus on sector-level analysis in Part 2, much of this work may be delegated to relevant line ministries. The coordinating ministry and cross-ministerial governance structure will play a key role in understanding the interactions between different sectors, along with transition risks and opportunities to be managed. This will require iteration between sectoral and whole-of-economy analyses to inform decision-making on where a government should prioritise its efforts.
PART 2, ACTIVITY 1

Describe long-term sectoral decarbonisation pathways.

OVERVIEW

This activity supports governments to design long-term transition pathways for key emissions sectors (if this analysis has not already been done in the development of the long-term strategy).

Sectoral decarbonisation pathways create the evidence base for a common understanding of the current status, scale and pace of deployment required for low carbon technologies. This base is then used to evaluate the investment need, the policy context, transition risks and opportunities, and identification of priorities for development objectives. Sectoral pathways also help governments to understand the role that each sector plays in the national effort to achieve low carbon growth.

When identifying the range of technologies to include in sectoral decarbonisation pathways, consider that achieving net zero emissions requires four distinct types of activities (see Figure 4), which apply to varying degrees in each sector.

FIGURE 4. THE FOUR PILLARS OF DEEP DECARBONISATION

- REDUCE ENERGY USE
  Choose equipment and assets that use less energy and get more out of the energy that is used in areas such as buildings, manufacturing, transport and infrastructure.

- PRODUCE CLEANER ELECTRICITY
  Transition electricity generation away from imported fossil fuels to cleaner, locally produced low emissions sources such as solar, wind, hydro and bioenergy.

- SWITCH TO CLEANER FUELS
  Once electricity is powered by clean energy, switch every energy-using activity you possibly can to electricity and everything else to low emissions alternatives (e.g. from diesel to biodiesel in transport).

- SORT OUT AND STORE THE REST
  Reduce non-energy emissions like agriculture and refrigerant gases and capture and store remaining emissions through actions like restoring forests and blue-carbon ecosystems.

Source: ClimateWorks Australia 2018, p. 5
Ideally the process should be informed by a ‘backcasting’ approach: start with a clear long-term end goal, and design sectoral decarbonisation pathways to achieve it. This methodology is different from the forecasting approach typically taken with NDCs, where countries work from the present to determine what can be achieved through incremental improvements in policy and technologies. The two approaches are complementary: a backcasting approach identifies areas where ambition needs to be pushed and where planned choices in technologies and infrastructure may be incompatible with the long-term goal, while forecasting supports consideration of current technology, policy and capacity constraints.

A scenario-based approach to long-term sectoral decarbonisation pathways is well suited to backcasting, allowing countries to explore a range of technology options or combinations while taking into account future uncertainty. Figure 5, for example, provides an illustration of the hypothetical energy generation mix under different scenarios, showing the very different outcomes for energy generation technologies and grid infrastructure depending on the pathway chosen. Long-term sectoral decarbonisation pathways should consider the lifecycle of existing capital stock and factor in realistic timeframes for replacement to ensure that the policy and investment context to support new technologies is ready at the right time.

Sectoral decarbonisation pathways can communicate to development finance institutions (DFIs) and the private sector how planned investment aligns with long-term emissions goals and where investment opportunities exist over the short, medium and long term. This information can also be factored into sector plans and targets, signalling to investors and planners about future changes to support a more orderly transition (OECD 2017).

While the objective of this activity is the identification of pathways to net zero emissions for each sector, it is also important to think through the interactions between sectors that can either help or hinder achievement of emissions reduction. This is best coordinated centrally. For example, ambitious energy efficiency and fuel switching in heavy industry has implications for energy demand, while a shift to biofuels for transport may have implications for land use.
APPROACH

The development of long-term sectoral decarbonisation pathways may be led by relevant line ministries, research institutes with sectoral expertise or a central government agency with suitable modelling capability.

1. Draw on existing work that may have been completed, such as:
   - long-term climate strategy sectoral emissions projections and decarbonisation analysis.
   - existing sectoral emissions reduction strategies, plans and targets including NDCs.
   - country-specific analysis from credible, independent sources such as the International Energy Agency, IRENA and REN21.
   - key sectoral indicators describing how the sector is expected to change over time (for example, demand projections, economic indicators, emissions baseline and projections, fuel mix).
   - other sector-specific indicators that are useful for decision-makers and investors (for example, environmental, social and economic indicators).
   - retirement/replacement schedule for existing infrastructure assets in each sector.

2. Build or elaborate the baseline for the country’s key emitting sectors, the main sources of emissions and projected business-as-usual emissions growth in each sector.

3. Drawing on long-term strategy sectoral analyses and/or targets, build a granular picture of the possible technology pathways to achieve net zero by mid-century.
   - Identify the key decarbonisation solutions (technologies, changes in consumer demand, etc.) and assumptions for each sector, drawing on both global and local analysis and technology studies.
   - Consider which solutions are complementary or dependent on each other, and which solutions are ‘either/or’ options (reflecting a choice, and therefore a potential competition between choices). This allows modelling teams to develop consistent scenarios and decarbonisation pathways to identify ‘no-regrets’ actions.
   - Test findings with industry experts to inform assumptions about the viability and potential of each technology, as well as any factors affecting each technology’s adoption.

4. Model technology pathways to deep decarbonisation for each key emissions sector, ideally using a normative scenario-based approach.

5. Map how deployment of decarbonisation technologies can be best aligned with retirement of emissions-intensive infrastructure to minimise stranded asset risk.

6. Iterate between sectoral models and a whole-of-economy model to understand and account for interactions between sectors and to ensure national targets are achievable.

7. Where feasible, build technology cost assumptions into modelling to inform investment needs assessment and planning in subsequent activities.

8. Include indicators in modelling, along with time steps, to provide inputs to subsequent activities (see Table 9 in the Appendix) and enable monitoring and evaluation.

THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:

- Granular sector decarbonisation pathways to provide clear guidance on the scale and pace of transformation to inform a range of subsequent activities.
- Indicators that can inform assessment of progress to support prioritisation (Part 2, Activity 6) and measurement and evaluation (Part 1, Activity 7).
- If possible, investment required by technology (addressed in Part 2, Activity 2, if not completed here). Otherwise, investment indicators (see Table 9 in the Appendix) can be produced to inform Part 2, Activity 2 (Assess investment need over time) and Part 5, Activity 1 (Develop investment plan and pipeline).
- Risk and opportunity indicators to inform Part 2, Activity 5 (Consider long-term risks and opportunities).
- Graphs, such as those illustrated in Figure 5 above and Figure 10 (see Appendix), to provide an indication of the scale and pace of change in key technologies, which can be useful for policymakers, development partners and investors.
TOOLS & RESOURCES

+ **Building scenarios for mitigating climate change**
  University of Cape Town n.d.

  Short video outlining an approach to developing normative and strategic scenarios to mitigate climate change in developing countries. This video was produced as part of a free online course, Climate Change Mitigation in Developing Countries, that governments and modelling teams may also find useful.

+ **Planning for a low carbon future, energy sector management assistance program (ESMAP)**
  World Bank 2012.

  Section 3: Modelling low carbon development, p.21 describes the approach to modelling low carbon development using scenarios and describes different top-down and bottom-up models suited to this purpose (usually up to 2030).

+ **Low carbon development: planning & modelling**

  This course has four modules - (i) Overview for Policymakers; (ii) Power; (iii) Household; (iv) Transport – that introduce climate change mitigation, explore the concepts surrounding low carbon development planning on an economy-wide basis, and take a detailed look at what this means in the power and transport sectors and for household electricity use.

+ **Handbook for conducting technology needs assessment for climate change**
  UNFCCC 2010.

  Designed to assist countries in making informed decisions in their technology choices, it offers a systematic approach for identifying, evaluating and prioritising technologies for inclusion in national strategies.

+ **LEAP: Introduction**

  LEAP, the Long-range Energy Alternatives Planning System, is a widely-used software tool for energy policy analysis and climate change mitigation assessment, developed at the Stockholm Environment Institute. This website provides various resources for using LEAP.

+ **World energy outlook**
  IEA 2019.

  Includes data by category, indicator, country or region for energy generation and end-use technologies.

+ **GeoNetwork**
  Food and Agriculture Organization (FAO) 2020.

  Provides a portal to a range of land-related geospatial databases such as forestry, hydrology and water resources, infrastructure and land cover and use.

+ **Energy technology perspectives**
  IEA 2006-2016.

  Includes a series of publications on technologies that can be used to decarbonise the economy.

+ **Accelerating climate action: Refocusing policies through a well-being lens**
  OECD, 2019.

  Analyses synergies and trade-offs between climate change mitigation and broader goals such as health, education, jobs, wider environmental quality and the resources needed to sustain livelihoods. Focuses on five economic sectors (electricity, heavy industry, residential, surface transport and agriculture) that are key for decarbonisation.

+ **The role of modeling and scenario development in long-term strategies**
  World Resources Institute (WRI) n.d.

  Discusses the role of modelling as a tool for developing long-term strategies and presents some of the limitations and uncertainties associated with different modelling tools.
PART 2, ACTIVITY 2

Estimate investment need over time.

OVERVIEW

This activity aims to provide an estimate of the financing needed in each key sector to achieve long-term decarbonisation goals. A bottom-up cost approach, a top-down macroeconomic approach or a combination of both approaches can be used. Different modelling approaches are discussed in Jeurgens et al. (2019) in the tools and resources section.

Investment needs assessments are required to inform long-term decisions, particularly where market failures will require policy intervention to unlock capital over time. An investment needs assessment can also create insights that can legitimise and motivate choices made by private and public decision-makers (Jeurgens et al. 2019).

Depending on the type of modelling approach taken to develop sectoral decarbonisation pathways (Part 2, Activity 1), it may be possible to extract investment numbers from that modelling. Note that estimates of investment need are dependent on the underlying assumptions taken in the modelling process. Such forecasts as fuel and technology prices, interest rates, technology adoption rates and technology lifespan can have significant impacts on the final outcome of investment needs assessments. It is also crucial to understand what is and is not included in the business-as-usual or baseline scenario, as investment need is typically stated as additional costs on top of the baseline (Jeurgens et al. 2019).

BEST PRACTICE

Governments could also quantify any costs associated with early retirement of existing fossil fuel assets and industries to better inform understanding of overall transition costs.

Some climate impacts are locked in, even if the goals of the Paris Agreement are achieved. Where feasible, governments could also include estimates of adaptation investment requirements in this analysis. Given that these costs can be expected to increase over time, it is useful to create a holistic picture of the long-term investment task for stabilising and adapting to climate change. This can also inform assessment of infrastructure projects to ensure they meet both mitigation and resilience objectives.
## APPROACH

Development of sectoral investment analyses may either be led by relevant line ministries, and consolidated centrally by the coordinating government agency, or be led centrally, with consultation with line ministries and sector experts.

1. Draw on any existing work that may have been completed, such as:
   - sectoral decarbonisation pathways data (for example, technology cost data and investment indicators – see Table 9 in the Appendix) to inform quantification of investment required by sector up to 2050
   - economic indicators from sectoral decarbonisation pathways analysis (see Table 9 in the Appendix)
   - clean technology deployment planning
   - sector investment plans
   - technology and infrastructure cost assumptions from NDCs
   - analysis of the impacts of a carbon price on the economics of climate action in your country, such as through the World Bank’s Partnership for Market Readiness.

2. Quantify the investment needed for each sector to achieve long-term strategy emissions targets, using a bottom-up cost approach, a top-down macroeconomic approach, or combination of both approaches (see tools & resources, p.54, for different modelling approaches).

3. Given uncertainties over clean technology costs over the medium to long term, use uncertainty ranges and sense check assumptions with experts to provide confidence in the analysis.

4. Use current sectoral investment plans and their assumptions as a point of reference to understand additional investment needs beyond business-as-usual.

5. If carbon pricing analysis has been done, evaluate any implications for investment (for example, cost competitiveness of clean technologies, investment and risk sharing, impact on valuation of existing assets and stranded asset risk in key sectors).

6. Where possible, analyse the wider macroeconomic impacts of the estimated investment.

---

**This activity should produce the following outputs:**

- Investment projections, at a whole-of-economy and sectoral level, over the short-medium- and long-term to inform Part 5, Activity 1 (Develop investment plan and pipeline).
- Investment risk indicators (see Table 9 in the Appendix) to inform Part 2, Activity 5 (Consider long-term risks and opportunities).
- The production of graphs such as those illustrated in Figure 11 and Figure 12 in the Appendix, which can be useful for communication with policymakers, development partners and investors. Figure 11 gives a summary of overall investment need in key sectors over different time horizons, which is particularly useful for whole of government forward planning. Figure 12 provides a more granular investment assessment by technology in a given sector (in this illustration, the power sector) which is more useful for guiding sector-specific planning and financing.
TOOLS & RESOURCES

+ How to assess investment needs and gaps in relation to national climate and energy policy targets? A manual – and a case study for Germany
   Juergens & Rusnok Advisors 2019.
   This report provides a review of existing models and studies used to assess long-term investment-related decisions and focuses on strengthening the understanding and skills of decision-makers at ministries and public banks. It also focuses on the needs of those operating public financial support schemes, including those who are responsible for tackling the investment challenge of meeting 2030 energy and climate targets.

+ Planning for a low carbon future
   ESMAP/World Bank 2012.
   Section 3: Modelling low carbon development describes different top-down and bottom-up models that are capable of estimating long-run investments needed to achieve low carbon scenarios (usually up to 2030). It outlines the strengths and weaknesses of different modelling approaches and the factors to consider in choosing an approach.

+ Data, research and resources on renewable energy costs
   IRENA 2019.
   Provides a range of data on renewable energy, energy storage and clean transport cost trends at a country, regional and global level.

+ Annual technology baseline: Electricity
   NREL 2019.
   Provides a spreadsheet that includes the assessments of current and projected technology costs and performance for both renewable and conventional electricity generation technologies in the US.
PART 2, ACTIVITY 3

Align sectoral decarbonisation pathways and Nationally Determined Contributions (NDCs).

OVERVIEW

‘What if I told you that making greenhouse gas emissions reduction targets more stringent would be cheaper than keeping current ones? That might seem to defy logic. But it makes sense when you consider the financial costs of continuing to invest in technologies that take us only part way to our ultimate emissions-reduction goals, only to have to abandon them in mid-stream.’

(Vogt-Schilb and Binsted 2019).

A key rationale for the development of a long-term strategy is to understand where shorter-term mitigation ambition needs to be scaled up to meet long-term climate goals.

By aligning a country’s NDC with its long-term strategy, and, in particular, its sectoral decarbonisation pathways, governments can see where opportunities may exist to enhance ambition in the short and medium term, reducing the burden of delayed action to achieve climate targets later on.

Importantly, this process can also identify where planned investments are misaligned with the long-term decarbonisation pathways in a given sector (Chebly, Mancini & Zadek 2018). A clear example of this is planned new coal infrastructure which may be consistent with a country’s 2030 NDC but may be incompatible with its long-term climate goals.

Considering how a country’s NDC aligns with its long-term strategy is therefore key to ensuring that investment choices made today are compatible with both the country’s immediate needs and long-term climate goals. Given the longevity of infrastructure such as power stations, transport systems, buildings and industrial plants, it is critical to ensure investment choices are consistent with the long-term pathway to minimise the risk of either stranding assets or locking in emissions that are inconsistent with a country’s commitment to the Paris Agreement.

In submitting their NDCs to the United Nations Framework Convention on Climate Change (UNFCCC), developing countries were invited to include an ‘unconditional’ NDC, reflecting what they were able to achieve within their own means, and a more ambitious ‘conditional’ NDC, which requires international financial support. The gap between ‘unconditional’ and ‘conditional’ NDC targets therefore represents an investment need (see also Figure 6). Increasing the ambition of a country’s ‘conditional’ target in line with its long-term strategy trajectory signals to the international community a desire to increase climate ambition, but provides clear indication that increased international finance is critical to achieve that ambition.

Identifying ways to increase NDC ambition can therefore increase the attractiveness of that country for international support and investment, in addition to setting a country on a transformative path early on (Roeser et al. 2019).
PART 2, ACTIVITY 3

FIGURE 6: GAPS BETWEEN NDC TARGETS AND THE NECESSARY LONG-TERM DECARBONISATION AMBITION SHOULD BE ASSESSED.

MtCO2e

2020 2030 2050

NDC (unconditional) NDC (conditional) LTS

BEST PRACTICE

Consider national adaptation priorities (those included in long-term strategy, NDCs and/or in National Adaptation Plans), and how sectoral decarbonisation pathways may interact with these. Identify any opportunities that enhance both resilience and mitigation outcomes.
APPROACH

1. Draw on any existing work that may have been completed, such as:
   + NDC analysis and implementation plan
   + Long-term strategy mid-century and interim greenhouse gas (GHG) emissions targets
   + Sectoral decarbonisation pathways and interim greenhouse gas emissions targets
   + Any economic indicators that provide a point of reference or comparison to the NDC (for example, GDP, investment per sector).

2. Analyse NDC emissions trajectories and targets against long-term strategy and sector decarbonisation pathways and targets, to identify any gaps between them.

3. Evaluate the scale and pace of change required over the short, medium and long term to achieve long-term strategy targets, under a range of NDC scenarios (for example, current unconditional and conditional NDC, enhanced ambition, aligned with long-term strategy trajectory).
   + The focus should be on identifying areas where ambition could be scaled up in the NDC to ensure the achievement of the long-term mitigation target. This can both highlight areas of additional investment need (‘conditional’ NDC target) and help to identify areas of potential misaligned investment risk – for example, in infrastructure that is compatible with current NDC commitments but that may be at risk of asset stranding when compared to the Paris-compatible long-term trajectory. This can provide input to Part 2, Activity 5 (Consider long-term risks and opportunities).

4. Compare current NDC implementation plan with mitigation actions in sectoral decarbonisation pathways to identify opportunities for increasing ambition this decade. This can provide input to Part 2, Activity 6 (Prioritise actions) by highlighting areas of investment that are critical over the coming decade to ensure alignment with the mid-century emissions reduction target.

5. Evaluate the change in investment need (in particular, through international support) and any implications for asset stranding over the long term if NDC ambition is increased.

6. This analysis can be used to inform future NDC updates.

THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:

+ Identification of opportunities to enhance NDC ambition (both ‘unconditional’ and ‘conditional’) to ensure mid-century emissions reduction targets can be achieved, to inform Part 2, Activity 6 (Prioritise actions), and future NDC updates.

+ Identification of additional international finance support needed to achieve ‘conditional’ NDC.

+ Identification of potential misaligned investment in key emissions sectors over the short, medium and long term to inform risk analysis in Part 2, Activity 5 (Consider long-term risks and opportunities).

AREAS FOR FURTHER WORK

There is currently a gap in frameworks or approaches for how to align NDCs and long-term strategies.
TOOLS & RESOURCES

+ **Climate action for today and tomorrow: The relationship between NDCs and LTSs**
  WRI n.d.
  Explores how NDCs and long-term strategies relate to one another and how countries can allocate resources efficiently to develop both in a synergistic manner.

+ **Key questions guiding the process of setting up long-term low emissions development strategies**
  OECD 2019.
  Discusses potential elements to be included in a long-term strategy and identifies and explores potential linkages between Nationally Determined Contributions (NDCs) and a long-term strategy.

+ **Strengthening climate goals will end up saving money for Latin America and the Caribbean**
  Vogt-Schilb and Binsted 2019.
  Outlines the key findings from a paper (linked on page) that finds that more ambitious NDCs reduce the risk of asset stranding and therefore reduce the investment required to achieve the Paris Agreement in Latin American and Caribbean countries.

+ **Aligning Development co-operation and climate action: The only way forward**
  OECD 2019.
  Report outlines a conceptual framework for development cooperation providers. It supports them to design, implement and continually assess their efforts to align with the Paris Agreement.
PART 2, ACTIVITY 4

Link sectoral decarbonisation pathways to Sustainable Development Goals (SDGs).

OVERVIEW

Thinking through how sectoral decarbonisation pathways interact with Sustainable Development Goals (SDGs) can help to prioritise actions in the short and medium term that deliver multiple benefits. For example, bringing forward investment in urban public transportation systems can help to avoid increasing road congestion and improve air quality and public health outcomes (SDG 3), while also enhancing access to affordable transport (SDG 11) and thus helping vulnerable communities to access better jobs (SDG 8).

Identification of these co-benefits is key to ensuring that efforts to decarbonise the national economy also accelerate sustainable development. It can increase confidence in enhanced climate ambition through creating new understanding of the broader sustainable development impacts and benefits that can be achieved through decarbonisation. As well as building confidence in new technology developments (Roeser et al. 2019).

While the interaction between decarbonisation and SDGs is an emerging field that has generated a swathe of reports, tools and resources, identifying and measuring these interactions to inform policy design and investment prioritisation can be complex. Depending on capacity, governments can choose either a light-touch qualitative approach, or a quantitative assessment.

The focus of mitigation/SDG interaction research typically focuses on co-benefits. But governments may also wish to consider potential trade-offs. For example, a shift to biofuels can significantly reduce transport emissions, but may also create risks for food security and biodiversity. Large-scale hydro can provide zero emissions baseload electricity, but can affect water security and downstream river health. Identifying and managing these trade-offs is key to achieving the economic, social and environmental balance that underpins the SDGs.

Table 2 provides examples of such trade-offs.

<table>
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<tbody>
<tr>
<td><strong>POSITIVE FOR MITIGATION</strong></td>
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<tr>
<td>Positive for adaptation</td>
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<tr>
<td>Reduced deforestation: Sequesters carbon and provides ecosystem services.</td>
</tr>
<tr>
<td>Agricultural practices (e.g. no till): Sequesters carbon and can boost farmers’ incomes.</td>
</tr>
<tr>
<td>Wetland restoration: Sequesters carbon and reduces flood risk.</td>
</tr>
<tr>
<td>Renewable energy (wind, solar PV): Lowers water use compared to thermal generation.</td>
</tr>
<tr>
<td><strong>POTENTIAL TRADE-OFF WITH MITIGATION</strong></td>
</tr>
<tr>
<td>Desalination: Addresses water shortage but is energy-intensive.</td>
</tr>
<tr>
<td>Increased Irrigation: Helps farmers manage variable precipitation but can be energy-intensive.</td>
</tr>
<tr>
<td>Air conditioning: Reduces the impact of high temperatures on health, but is energy-intensive.</td>
</tr>
<tr>
<td>Construction of hard defences: Reduces the risk of extreme events, but GHGs are embodied in the construction.</td>
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<tr>
<td>Inappropriate expansion of biofuels: Could exacerbate food price shocks if biofuels displace crops.</td>
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<tr>
<td>Hydropower: Could increase the complexity of managing water resources.</td>
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**CASE STUDY**

**SCENARIOS ON LABOUR IMPACT OF COAL ‘PHASE DOWN’ IN CHILE**

Phasing out coal in Chile has been found to stimulate jobs growth, with between two to eight thousand additional jobs created by direct employment in renewable energy and indirect employment in related services.

Scenarios show the negative impact of jobs lost could be mitigated, as jobs in coal mining were marginal and could be offset by an increase in jobs in other mining activities such as the extraction of copper, lithium and rare earth elements (the raw materials required by renewable energy technologies).

The scenarios indicate phasing out coal could deliver up to US$100 million in value added to the power generation sector in 2030, compared to 2019. This increase comes from switching from coal to renewable energy, which adds more value as the cost structure of solar and wind includes a higher share of imported resources.

Overall, phasing out coal was found to have positive outcomes for SDG 8, delivering both an increase in labour and economic growth. Careful planning and implementation of coal phase-out mitigated any negative impacts.

Source: Vogt-Schilb and Feng 2019
**APPROACH**

1. **Draw on any existing work that may have been completed, such as:**
   - sectoral decarbonisation pathways, interim targets and economic, social and environmental indicators (from Part 2, Activity 1)
   - mapping of long-term strategy socio-economic indicators against development targets and indicators (from Part 1, Activity 3)
   - SDG implementation plan.

2. **Undertake literature review to identify potential interactions between mitigation actions in sectoral decarbonisation pathways and priority SDGs.** The tools and resources suggested on p.62 provide a useful starting point.

3. **Assess significance of interactions between mitigation actions and priority SDGs** (this can be expanded to include long-term development goals) in the national context to identify potential synergies (co-benefits). A simple qualitative analysis is sufficient, but countries may choose to quantify these interactions where sufficient data and expertise exists. Synergies could include:
   - positive impacts on economic and per capita income growth
   - jobs creation
   - enhanced energy access
   - air pollution and health benefits
   - environmental outcomes such as land restoration, water health and biodiversity outcomes.

4. **Where possible, also consider any potential trade-offs and explore options for minimising them.**

5. **Identify areas where sectoral decarbonisation actions should be adjusted to maximise co-benefits and minimise trade-offs, and iterate sectoral decarbonisation pathway analysis (Part 2, Activity 1) as required.**

6. **Review SDG implementation plan and strengthen any actions that can also deliver increased climate mitigation benefits.**

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**FIGURE 7: QUALITATIVE APPROACH TO MAPPING MITIGATION ACTIONS AND SDG INTERACTIONS (BASED ON APPROACH DESCRIBED IN CLIMATEWORKS SMART TOOL)**

<table>
<thead>
<tr>
<th>Mitigation action 1</th>
<th>Description of interaction</th>
<th>Description of interaction</th>
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<tbody>
<tr>
<td>Mitigation action 2</td>
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<td>Description of interaction</td>
<td>Description of interaction</td>
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<td>Mitigation action 3</td>
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<td>Mitigation action 4</td>
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<td>Mitigation action 5</td>
<td></td>
<td>Description of interaction</td>
<td>Description of interaction</td>
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</tr>
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</table>

**DEGREE OF INTERACTION**

- Strong negative
- Negative
- Positive
- Strong positive

---

**THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:**

- Analysis or mapping of co-benefits of mitigation actions against priority SDGs to inform Part 2, Activity 6 (Prioritise actions).
- Analysis or mapping of potential trade-offs to inform Part 2, Activity 6 (Prioritise actions).
- Updated sectoral decarbonisation pathways, as needed.
- A simple qualitative assessment approach to map and evaluate interactions is suggested in Figure 7.
TOOLS & RESOURCES

+ **Accelerating climate action: Refocusing policies through a well-being lens**
  OECD, 2019.
  Analyzes synergies and trade-offs between climate change mitigation and broader goals such as health, education, jobs, wider environmental quality and the resources needed to sustain livelihoods. Focuses on five economic sectors (electricity, heavy industry, residential, surface transport and agriculture) that are key for decarbonisation.

+ **Development Impact Assessment (DIA) Visual Tool**
  LEDS-GP n.d.
  The DIA visual tool provides an approach to identify, document and communicate the potential impacts of low emissions development actions on a country’s social, economic and environmental development priorities. It can support decision-makers in exploring potential policy synergies and trade-offs to achieve development goals and help build consensus for action among stakeholders.

+ **SCAN Tool**
  New Climate Institute 2018.
  The SDG Climate Action Nexus tool (SCAN-tool) provides high-level guidance on how climate mitigation and adaptation actions can impact achievement of the SDGs including synergies and trade-offs. Results are presented in a high-level overview using infographics. The tool contains a downloadable methodology note, key findings, dataset and tool template.

+ **Climate action impact tool: Assessing climate action contributions to the SDGs**
  UNDP n.d.
  This bottom-up tool enables stakeholders to identify and quantify direct impacts, define indicators, set targets and track the progress of actions towards the SDGs. The tool is separated into various impact categories that are linked to the relevant SDGs, allowing policymakers to track the impact of NDC mitigation actions on the SDGs. The outcome of the tool is a detailed assessment of each mitigation action. The robustness of the output depends on the quality and extent of quantitative and qualitative data provided by the user. This tool supports users to undertake their own detailed assessments, and complements the more generic guidance provided by the SCAN-tool.

+ **NDC-SDG connections**
  Stockholm Environment Institute (SEI) & German Development Institute (DIE) 2018.
  Compares how NDC actions relate to each SDG. Uses mainly text analysis, counting the frequency of key words as well as the volume of committed activities of a country in a certain policy sector. The analysis informs about potential linkages to SDGs explicitly mentioned in the NDCs in a visualised online format allowing for country comparisons. Results also include a policy brief.

+ **A guide to SDG interactions: From science to implementation**
  Describes a simple seven-point scale for assessing interactions between SDGs and applies this to four SDGs, including SDG7: Affordable and clean energy.
TOOLS & RESOURCES (CONT.)

+ **Climate watch: Data on climate action**
  WRI 2020.
  An online platform under the NDC Partnership. Brings together several datasets to enable users to analyse and compare the NDCs, among other features. A section on sustainable development objectives identifies actual alignment between countries’ NDCs and the SDGs. Presented in a clear map and infographics.

+ **SMART TOOL**
  ClimateWorks Australia 2018.
  This Strategic Mitigation, Adaptation and Resilience Tool (SMART) is a downloadable Excel resource designed to help countries vulnerable to the impacts of climate change identify and better understand interactions between mitigation actions and adaptation and resilience priorities.

+ **Aligning Nationally Determined Contributions and Sustainable Development Goals: Lessons learned and practical guidance**
  UNDP 2017.
  Provides nine critical entry points for fostering complementarity between NDCs and SDGs. Examples are also provided to illustrate how these entry points translate in a country context.
PART 2, ACTIVITY 5

Consider long-term risks and opportunities.

OVERVIEW

Transforming an economy to achieve climate ambition alongside sustainable growth presents a range of risks and opportunities (see Table 3). Governments have a key role in identifying and managing risks and opportunities to ensure an orderly transition, avoid economic disruptions and maximise green growth. Some examples of where risks and opportunities may arise are:

- Countries affected by the actions of the rest of the world to reduce emissions in line with the Paris Agreement. For example, export-oriented economies that manufacture high-carbon products face a transition risk. As global demand declines, countries manufacturing low carbon products can capture export growth opportunities, as global demand for these goods increases. (OECD 2017, p.256)

- Emissions-intensive industries and regions expected to decline without significant effort to adapt to the new normal. The role of government should be to support a just transition to minimise social and economic impacts.

| TABLE 3: CLIMATE-RELATED RISKS AND OPPORTUNITIES |

<table>
<thead>
<tr>
<th>TYPE</th>
<th>CLIMATE-RELATED RISKS</th>
<th>TYPE</th>
<th>CLIMATE-RELATED OPPORTUNITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRANSITION RISKS</td>
<td><strong>Policy and Legal</strong></td>
<td>RESOURCE EFFICIENCY</td>
<td>+ Use of more efficient modes of transport</td>
</tr>
<tr>
<td></td>
<td>+ Increased pricing of GHG emissions</td>
<td></td>
<td>+ More efficient production and distribution processes</td>
</tr>
<tr>
<td></td>
<td>+ Enhanced emissions-reporting obligations</td>
<td></td>
<td>+ Use of recycling</td>
</tr>
<tr>
<td></td>
<td>+ Mandates on and regulation of existing products and services</td>
<td></td>
<td>+ More efficient buildings</td>
</tr>
<tr>
<td></td>
<td>+ Exposure to litigation</td>
<td></td>
<td>+ Reduced water usage and consumption</td>
</tr>
<tr>
<td></td>
<td><strong>Technology</strong></td>
<td></td>
<td><strong>ENERGY SOURCE</strong></td>
</tr>
<tr>
<td></td>
<td>+ Substitution of existing products and services with lower emissions options</td>
<td>+ Lower emission sources of energy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>+ Unsuccessful investment in new technologies</td>
<td>+ Supportive policy incentives</td>
<td></td>
</tr>
<tr>
<td></td>
<td>+ Upfront costs to transition to lower emissions technology</td>
<td>+ Emergence of new technologies</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Markets</strong></td>
<td></td>
<td>+ Participating in carbon market</td>
</tr>
<tr>
<td></td>
<td>+ Changing customer behavior</td>
<td>+ Energy security and shift towards decentralisation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>+ Uncertainty in market signals</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>+ Increased cost of raw materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Reputation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+ Shift in consumer preferences</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>+ Stigmatisation of sector</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>+ Increased stakeholder concern or negative stakeholder feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PHYSICAL RISKS</strong></td>
<td><strong>Acute</strong></td>
<td></td>
<td><strong>PRODUCES AND SERVICES</strong></td>
</tr>
<tr>
<td></td>
<td>+ Increased severity of extreme weather events such as cyclones and floods</td>
<td>+ Develop and/or expand low emission goods and services</td>
<td></td>
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<tr>
<td></td>
<td><strong>Chronic</strong></td>
<td>+ Climate adaptation and insurance risk solutions</td>
<td></td>
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<tr>
<td></td>
<td>+ Changes in precipitation patterns and extreme weather variability</td>
<td>+ R&amp;D and innovation</td>
<td></td>
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<tr>
<td></td>
<td>+ Rising mean temperatures</td>
<td>+ Diversify business activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>+ Rising sea levels</td>
<td>+ Shifting consumer preferences</td>
<td></td>
</tr>
<tr>
<td><strong>RESILIENCE</strong></td>
<td></td>
<td><strong>MARKETS</strong></td>
<td>+ New markets</td>
</tr>
<tr>
<td></td>
<td><strong>Encourage innovation and development of low emission goods and services</strong></td>
<td>+ Public-sector incentives</td>
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<td></td>
<td></td>
<td>+ Community needs and initiatives</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>+ Development banks</td>
<td></td>
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<tr>
<td></td>
<td>+ Participate in renewable energy programs and adopt energy-efficiency measures</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+ Resource substitutes/diversification</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+ New assets and locations needing insurance coverage</td>
<td></td>
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</tbody>
</table>

Source: TCFD 2017, p.10-11
+ Existing and planned assets incompatible with the transition or representing an asset class that is losing investor confidence globally which are therefore at risk of asset devaluation and stranding. All countries must switch to carbon-free electricity generation by 2050 to stabilise climate change. As most fossil fuel power plant assets have an expected lifetime of 30-50 years, this asset class is at particularly high risk (Audoly et al. 2018, Davis et al. 2018, Williams et al. 2012, Fay et al. 2015, Grubb et al. 2018, Millar et al. 2016, Sachs et al. 2016 in González-Mahecha et al. 2019).

+ Upstream fossil fuel energy extraction, production and export infrastructure at high risk of asset stranding if global climate targets are to be achieved. This, in turn, has implications for fiscal revenue from resource rents. Global demand for these resources, along with the commodity price they attract, can be expected to decline (Solano-Rodríguez et al. 2019).

+ Low-income households hit by increasing electricity prices and the subsequent increase in the cost of goods and services if targeted interventions are not implemented.

Transition risks pose a threat to financial systems. Misaligned investment, asset stranding, and the steep decline in share value of exposed companies can have significant implications for the national financial system.

Addressing climate change also presents a range of economic opportunities for governments in developing countries. While some industries will decline in the transition, new ones will emerge. Understanding a country’s low carbon strengths is key to turning the transition into an economic growth opportunity. Strengths may be nascent (for example, under-exploited natural resources required for the production of low carbon technologies) or be based on established capabilities or industries that can pivot to capture new opportunities (as seen in the shift from internal combustion engine cars to EVs). Governments should harness these strengths (or ‘comparative advantages’) to achieve national long-term development targets, while also creating opportunities for economic diversification and export market growth.

Supply chains should be analysed to identify whether opportunities exist for technology to be produced domestically or whether the country should be a ‘technology-taker’. This can be done by exploring the state and size of the global technology market and conducting a comparative advantage analysis for the country.

There is considerable uncertainty involved in the global and national transition. Exploratory scenario analysis is a particularly useful tool for forward-looking assessment of a range of risks and opportunities across the economy. Exploratory scenarios focusing on plausible future states can help to understand key drivers and possible outcomes (IIGCC, n.d) and the strategies likely to be successful (Roberts 2014). Analysis can be quantitative, qualitative or have elements of both (IICGG, n.d.) Table 10 in the Appendix provides reference scenarios that may provide a useful baseline for development of national scenarios. Figure 13 also in the Appendix shows an example of heatmaps that can be used to create a visual representation of risks and opportunities over time and across different scenarios.
CASE STUDY

SOUTH AFRICA TRANSITION RISK STUDY

South Africa faces risks to its economy from a global economic low carbon transition. These include reduced demand and price for commodity exports such as coal and oil; asset stranding for infrastructure that supports high carbon activities including rail, power plants and ports; impacts on companies, investors and workers from lower prices and reduced demand for certain products; and reduced government revenues. The cumulative impact on South Africa over the period 2017 to 2035 could be more than US$120 billion in present value terms, with two thirds of that impact focused on the coal export sector. The majority of risk is borne by investors.

South Africa could, however, benefit from new markets for minerals used in low carbon technologies (such as platinum and manganese) or through the creation of new jobs in industries that can benefit from the transition.

Currently, South Africa provides incentives for new capital investment in industries that are exposed to transition risk, rather than new sectors that may create more sustainable jobs and economic growth. Planned investment decisions could add more than US$25 billion to the country’s transition risk, with US$20 billion of this from just two investments in an oil refinery and an industrial zone.

Recommendations to address this risk exposure include:

+ taking stock of the rapidly changing market for commodity exports and adapting development and financing plans accordingly
+ avoiding or delaying new investments that could add to risk exposure and shift capital allocation to sectors more resilient to, or benefiting from, the low carbon transition
+ making risk allocation explicit to reduce unmanaged risks and improve the efficiency of managing those risks
+ managing the timing and speed of climate mitigation actions and commitments to avoid compounding shocks to the economy
+ planning for transition risk to vulnerable workers and investors
+ shifting some risks from the national public balance sheet to other parties, possibly including subnational governments, to increase risk-bearing capacity.

Source: Huxham, Anwar & Nelson 2019
**APPROACH**

This process is best done in close consultation with experts and key stakeholder groups. The development of scenarios should be factored into future reviews of the Investment Vision, to ensure the appropriate lessons can inform future approaches (Roberts 2014, IIGCC n.d.).

The approach described below is adapted from the Institutional Investor Group on Climate Change report *Navigating climate scenario analysis* (IIGCC n.d.).

1. Draw on any existing work that may have been completed, such as:
   + sectoral decarbonisation pathway analysis risk and opportunity indicators (see Table 9 in the Appendix for examples)
   + previous scenario-based risk and opportunity analysis at the national or sectoral level
   + analysis of the impacts of a carbon price on the economics of climate action in your country, such as through the World Bank’s Partnership for Market Readiness
   + Taskforce on Climate-related Financial Disclosures (TCFD) analysis undertaken by central banks including relevant sector risks and opportunities
   + climate risk stress-testing undertaken by central banks
   + green growth or comparative advantage analysis
   + natural resource mapping.

2. Establish clear objectives for the scenario analysis – for example, an understanding of the economic risks and opportunities of Paris-compatible decarbonisation trajectories compared to business-as-usual and the interaction with national development objectives.

3. Set the scope for analysis to determine which economic sectors will be included and whether the focus will include both transition and physical risks.

4. Develop several plausible scenarios that describe the future context in which the transition may take place. Reference scenarios such as those outlined in Table 10 in the Appendix can provide a useful starting point for scenario development, in particular for countries with emissions-intensive, trade-exposed industries. Governments can either adopt the underlying assumptions in these scenarios or adapt them to better reflect national circumstances.

5. Develop key indicators to assess risks and opportunities across different scenarios and time horizons, either quantitatively or qualitatively. These could include:
   + GDP at economy-wide and sector level
   + region, sector or industry exposure (for example, Gross Rating Point (GRP), sector value add)
   + investment requirements
   + finance sector risk exposure (for example, interest rate risk, liquidity risk, foreign exchange risk, concentration risk, volatility risk)
   + development of welfare indicators such as jobs, per capita GDP, public health.

6. Identify transition risks, in particular:
   + economic sectors, regions and communities affected across multiple scenarios by a decrease in activity
   + public and private finance sector risks.
   + potential shocks to the economy due to delayed action
   + infrastructure assets at risk of stranding.
   + changes in fiscal revenue from stranded.
   + impacts on low-income households and communities.

**CONT.**
7. Identify transition or green growth opportunities, such as natural resources, industries and skills that are expected to increase in demand domestically and globally.

8. Create an overarching picture of risk and opportunity across the national economy. A heatmap such as the one illustrated in Figure 13 in the Appendix can be useful for this activity.

9. Identify ‘no regrets’ actions – interventions to address risks or capture opportunities across multiple scenarios.

**THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:**

- An overview of key sectors and regions most vulnerable to transition risks to inform prioritisation of actions (Part 2, Activity 6) and design of policy and transition support measures (Part 4).
- An overview of key low carbon industry or green growth opportunities specific to the national context to inform prioritisation of actions (Part 2, Activity 6) and readiness assessment (Part 3).
- Stress test or macroeconomic shock analysis, useful for ministry of finance when formulating transition policies (Part 4).
- Risk analysis, useful for financial regulators in imposing or improving financial regulations, such as introducing a green portfolio requirement or guidelines for green banks.
- Risk analysis (at overview level), also useful for project developers or financing institutions looking at implementing blended finance (Part 5).

**AREAS FOR FURTHER WORK**

While there are a range of tools and resources available for the financial sector to support assessment of transition risks and opportunities through scenario analysis, there is currently no practical guide to support the same decision-making targeted specifically at policymakers.
TOOLS & RESOURCES

+ **TCFD technical supplement**
  Task Force on Climate-related Financial Disclosures (TCFD) 2017.
  Provides a detailed breakdown of the assumptions and outputs of specific transition scenarios on a range of variables.

+ **The Energy Transition Risk Project (ET Risk)**
  ET-Risk 2020.
  Provides research and tools to assess the financial risks and opportunities associated with the transition to a low carbon economy. The transition risk toolbox provides analysts, investors and policymakers with the scenarios, asset-level data and/or models needed to assess transition risk exposure.

+ **Transition risk framework: Managing the impacts of the low carbon transition on infrastructure investments**
  University of Cambridge Institute for Sustainability Leadership 2019.
  The framework is set out in three steps, which can be used independently or combined to explore transition risks and opportunities. Each of the three steps highlights practical actions investors might take in order to manage risks and capture opportunities. The framework applies this analysis to an array of global infrastructure asset types.

+ **International jobs and economic development impacts (I-JEDI)**
  NREL 2020.
  I-JEDI is a free online tool for analysing the economic impacts of renewable energy development around the world. I-JEDI estimates the employment, earnings, gross domestic product and output from the construction and operation of renewable energy projects and across the domestic supply chain. Results include total economic impacts, as well as impacts by industry (such as construction, manufacturing and banking services). This information helps align renewable energy action with key economic development goals.

+ **Committed emissions and the risk of stranded assets from power plants in Latin America and the Caribbean**
  Inter-American Development Bank 2019.
  Describes the methodology used to assess risk of asset stranding for power plants in Latin America and the Caribbean, which may be useful for other countries in their own analyses.

+ **Implications of climate targets on oil production and fiscal revenues in Latin America and the Caribbean**
  IADB 2019.
  Draws on Intergovernmental Panel on Climate Change (IPCC) scenarios to consider the impact of changes in global demand on oil production and fiscal revenues in Latin American and Caribbean countries. Includes a description of the methodology used which may be useful for other countries in their own analyses.

+ **Understanding the impact of a low carbon transition on South Africa**
  CPI 2019b.
  Provides a useful case study of the approach to low carbon transition risk and opportunity analysis, and the measures the government can take to reduce the costs associated with decarbonisation of the South African economy.
TOOLS & RESOURCES (CONT.)

+ **Navigating climate scenario analysis**
  Institutional Investor Group on Climate Change (IIGCC) n.d
  While designed for institutional investors, this guide provides practical guidance on how to design and develop climate risk and opportunity scenarios.

+ **A low carbon industrial strategy discussion paper series**
  ClimateWorks Australia & Vivid Economics 2019.
  Country studies for Vietnam, Indonesia and the Philippines to highlight areas of nascent and emerging low carbon comparative advantage. This work highlights how countries can move to the forefront of the global low carbon transition by taking advantage of emerging opportunities to make their economies resilient and future-focused. It also outlines a methodology used to identify low carbon industrial opportunities.

+ **Low emissions technology roadmap**
  Illustrates an approach to consider the economic opportunities that low carbon technologies can achieve, and the degree of difficulty involved in realising these opportunities. Focuses on Australia, but the methodology can be applied broadly.
PART 2, ACTIVITY 6

Prioritise actions.

OVERVIEW

This activity draws together the analyses completed previously in this part to prioritise decarbonisation actions to support multiple objectives over the coming decade. This is key for understanding where investment needs to be directed and for focusing policy reform where it matters most for the decade ahead.

This prioritisation should:

+ ensure that government effort is directed towards actions that can best meet short- and long-term climate and development objectives.
+ ensure actions are cost-effective across multiple dimensions.
+ avoid locking in unintended consequences, or locking out long-term decarbonisation and sustainable development opportunities and benefits.
+ take account of opportunities to minimise transition risks.
+ consider actions that can deliver green growth and sustainable development goals.

Countries may already be familiar with multi-criteria decision analysis (MCDA) approaches, which are well suited for this activity. With multi-criteria decision analysis, countries assess priority actions against a range of criteria to create a holistic picture of the overall economic, social and environmental benefits of different actions. Multi-criteria decision analysis can support this by facilitating a dialogue among stakeholders for a broader understanding of technologies and their contribution to development and climate goals (UNFCCC 2015).

Other approaches such as environmental cost benefit analysis or even marginal abatement cost curves (MACCs) are also suitable for this activity.

By directing investment strategically in the early stages of the transition, sectoral transformations can be catalysed to normalise new technologies and drive costs down (Roeser et al. 2019).
**CASE STUDY**

**CLUSTERING OF DEVELOPMENT PRIORITIES AND CRITERIA IN LAOS**

In developing its multi-criteria decision analysis approach as part of its technical needs assessment, Lao People’s Democratic Republic based its criteria on its national development priorities, as well as greenhouse gas reduction potential (for mitigation) or vulnerability reduction potential (for adaptation) and costs. This was used to inform selection of sectors and technologies on which to focus effort.

### TABLE 4: CLUSTERING OF DEVELOPMENT PRIORITIES AND CRITERIA IN LAO PDR

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs/investments</td>
<td>+ Costs in implementation, operation and maintenance.</td>
</tr>
<tr>
<td>GHG reduction</td>
<td>+ Potential for GHG emissions reduction or enhanced sequestration.</td>
</tr>
<tr>
<td>Adaptation potential</td>
<td>+ Potential for adaptation including reduction of vulnerability and impacts, while enhancing adaptive capacity.</td>
</tr>
<tr>
<td>Environmental benefits</td>
<td>+ Reduce negative environmental impacts. + Reduce air pollution.</td>
</tr>
</tbody>
</table>

Source: UNFCCC Technology Executive Committee 2015, p. 11.
**APPROACH**

1. **Draw on any existing work that may have been completed, such as:**
   + investment needs analysis from Part 2, Activity 2
   + key opportunities to enhance NDC ambition and avoid lock-in and misaligned investment from Part 2, Activity 3
   + development priorities from Part 1, Activity 3 and/or SDG alignment from Part 2, Activity 4
   + risk and opportunity analysis from Part 2, Activity 5.

2. **In consultation with key stakeholders, develop a set of economic, social and environmental criteria against which to assess priority actions. These could include:**
   + potential for greenhouse gas emissions reductions
   + cost
   + economic transition risks and opportunities
   + impact on key development priorities, such as growth in GDP, jobs creation, poverty alleviation, health, air quality, biodiversity etc.

3. **Use a multi-criteria decision analysis (MCDA) or environmental cost benefit analysis (CBA) approach to evaluate and rank mitigation actions. Criteria can be weighted to inform overall ranking of priority actions.**

4. **As needed, update analysis in previous activities. For example, prioritisation may identify clear benefits to scaling up deployment of a particular technology beyond what was originally modelled in Part 2, Activity 1 (Sectoral Decarbonisation Pathways analysis).**

**THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:**

+ A prioritisation of mitigation actions to inform activities in subsequent parts.
TOOLS & RESOURCES

+ A step by step guide for countries conducting a technology needs assessment
  Haselip et al. 2015.
  Section 3, p.13 outlines a process for prioritising technologies using a multi-criteria analysis.

+ Handbook for conducting technology needs assessment for climate change
  UNFCCC/UNDP 2010.
  Step 5.2, p.48, describes a process for assessing technologies with multi criteria decision analysis (MCDA) to facilitate robust decisions.

+ Good practices of technology needs assessments
  UNFCCC 2015.
  Section B, p.11, outlines an approach to prioritisation of sectors and technologies using multi-criteria decision analysis to consider mitigation, adaptation and development priorities. It includes case studies.

+ Cost-benefit analysis and the environment
  OECD 2018.
  Explores recent developments in environmental cost-benefit analysis (CBA) and describes the methods and elements used in its application. Environmental CBA is a means of applying CBA to projects or policies that have the deliberate aim of environmental improvement or are actions that affect the natural environment as an indirect consequence.

+ Nationally Appropriate Mitigation Action:
  Developing a Multi Criteria Decision Analysis (MCDA) process for prioritisation of NAMAs
  UNEP 2015.
  Provides a description of multi-criteria decision analysis including components, processes and methodology for weighting and scoring. It then describes the Nationally Appropriate Mitigation Action (NAMA) prioritisation process using multi-criteria decision analysis in detail.
ASSESS THE READINESS OF TECHNOLOGIES AND THEIR ENABLERS

ACTIVITY 1:
Understand barriers to deployment of low carbon technologies at scale
Tools and resources

ACTIVITY 2:
Understand finance sector readiness to deploy capital at scale
Tools and resources

ACTIVITY 3:
Assess current policies and initiatives, and identify policy gaps
Tools and resources
Part 3. Assess the readiness of technologies and their enablers.

There are a range of factors that affect how quickly low carbon technologies and the required finance will deploy in any national context. Understanding these constraints is key to determining the necessary interventions that can create the conditions for low carbon technology deployment and the enabling environment for investment. Part 3 focuses on assessing this context by evaluating the barriers and constraints that affect the ability of governments and the private sector to deploy low carbon technologies at scale, and suggesting how these can be addressed. It evaluates the readiness of the finance sector to deploy the required capital at scale, and considers how the existing policy context helps or hampers this.

These insights then sharpen the focus for policy review in Part 4.
PART 3, ACTIVITY 1

Understand barriers to deployment of low carbon technologies at scale.

OVERVIEW

This activity assesses the factors that can prevent low carbon technologies from being deployed at the scale and pace required, and thus affect the ability to attract capital. These barriers include any identifiable reason why a specific emissions reduction opportunity struggles to enter a market or be taken up in a given economy (ClimateWorks Australia 2018). Barriers can be categorised in a range of ways such as (adapted from Nygaard & Hansen 2015):

+ Technological readiness: Lack of technological maturity, lack of proof of concept in national context, issues with integration and operation at scale.
+ Commercial readiness: High cost of capital, perceived investment risk, low rate of return, high operating costs, low profitability compared to incumbent technologies (for example, due to subsidies).
+ Market and supply chain readiness: Lack of local suppliers of the technology or auxiliary goods and services, lack of established supply chains.
+ Skills transfer & workforce: Lack of required skills and capabilities in the national workforce.
+ Legal and regulatory: Legal context favours incumbents (such as utilities), highly regulated sector (which can make it difficult for new technologies to enter the market), or lack of regulation (for example, lack of efficiency or emissions standards), political economy (for example, power of vested interests), political instability, bureaucracy.
+ Institutional capacity: Limited institutional capacity to integrate new technologies into planning, policy, regulations and existing systems.
+ Awareness and acceptance: Lack of awareness, inadequate information on benefits/comparison to existing technologies, consumer/industry preferences and social biases, cultural and environmental sensitivities related to technologies.

The assumptions underpinning modelling of sectoral decarbonisation pathways may already factor in some assessment of these barriers, in particular technology, commercial and market readiness.

While a barriers assessment is most useful for informing policy assessment (Part 3, Activity 3), a more granular analysis of technology readiness and commercial readiness may better inform decisions about the type of investment support required and the relative roles of different actors, based on the stage of technology and commercial maturity (see Figure 9 in Part 5, Activity 1).

Governments should also consider the readiness of complementary infrastructure to deploy and integrate low carbon technologies at scale through consultation with experts and industry leaders. See Table 11 in the Appendix for examples of infrastructure needs for key low carbon technologies.

1 Governments should also consider whether emissions produced from production of a given technology is compatible with the long-term decarbonisation pathway, thus presenting a barrier to its scaling and uptake.
This enabling infrastructure can face additional barriers, including (Nassiry et al. 2016):

+ the capacity of domestic institutions to structure and negotiate projects
+ processes and aptitude for engagement among the proponents and beneficiaries
+ policy, regulatory and governance considerations
+ project feasibility, structuring and preparation, including pre-feasibility studies and feasibility studies
+ economics, including costs, likely returns and the risk tolerance of potential investors.

A critical enabler of the deployment of low carbon technologies and infrastructure is the skills and capabilities of the national workforce to build, deploy and maintain these investments. ‘Green skills’ are defined as those skills needed to adapt products, services and processes in line with related environmental requirements and regulations (Martinez-Fernandez 2013). They are needed across all sectors and at all levels in the workforce.

Understanding and quantifying the industrial and spatial impact of economic transformations is key to analysing the skills requirements. Underestimating the role of skills risks creating negative trade-offs between environmental and employment goals (Martinez-Fernandez 2013).

By understanding the barriers affecting deployment of key low carbon technologies, governments are better placed to determine the type of policy support and financing solutions required and how investment can be unlocked at scale over the desired timeframe.
CASE STUDY

ACCELERATING LOW CARBON INNOVATION AND DEPLOYMENT IN THE UK

During 2001–2008, the UK’s Carbon Trust used a range of targeted interventions to address barriers to wide-scale deployment of low carbon technologies, including:

- **Technology acceleration projects** in wave and tidal-stream power, micro-CHP (combined heat and power), advanced metering, low carbon buildings, biomass and offshore wind that addressed specific shared technical and market barriers faced by industry participants. Business incubation services provided targeted advice on intellectual property (IP) protection, IP licensing, fundraising and business planning to low carbon start-ups. Between 2004 and 2008, 57 companies participated and 25 went on to raise a total of £65m in private sector finance.

- **Enterprise development**, with the Carbon Trust building six new businesses, including Partnerships for Renewables, which secured over £100m of private sector funding from £10m public sector investment, accelerating the deployment of wind farms on UK public sector land.

- **Early stage venture capital support** for low carbon companies (which faced a funding gap in the UK). The Carbon Trust’s venture capital activities achieved a private sector leverage ratio of 10:1.

- **Deployment of existing energy efficiency technologies** through advice and resources to help businesses and the public sector identify and cut carbon emissions, working with over 50% of the FTSE 100 companies, conducting over 3,500 site surveys annually and providing over £18m in interest-free loans annually.

- **Policy and market insights** where, by demonstrating the viability and business case of low carbon technology opportunities, Carbon Trust also informed the UK policy landscape: for example, by the mandated roll-out of advanced meters following a field trial showing the cost effectiveness of the approach.

Since launch in 2001, Carbon Trust helped its customers to save 12 MtCO2 and its support of low carbon technologies leveraged over £2 of private sector capital for every £1 of Carbon Trust funding, and around £10 for every £1 committed to the venture capital investments.

Many of the approaches used by Carbon Trust in identifying barriers to technology innovation, working collaboratively with industry and leveraging private sector capital, are transferable to the context of the developing world.

Source: Carbon Trust 2008, p.24
PART 3, ACTIVITY 1

APPROACH

The analysis of barriers to deployment of low carbon technologies is best led by relevant line ministries, given their industry expertise and relationships. It should also draw on the expertise of ministries responsible for labour and workforce training to address skills gaps.

1. Draw on any existing work that may have been completed, such as:
   + sectoral decarbonisation pathways developed in Part 2, Activity 1
   + prioritisation developed in Part 2, Activity 6
   + technology deployment assumptions used in long-term strategy, sectoral decarbonisation pathways, NDCs
   + technology needs assessments
   + skills and workforce assessments
   + long-term electricity provision plan
   + long-term transportation infrastructure plan
   + regional spatial planning
   + infrastructure planning and priorities assessment/audit.

2. Engage with a broad cross-section of industry experts and stakeholders to identify key barriers to the deployment of priority low carbon technologies identified in Part 2, Activity 6 (Prioritise actions).

3. Draw on case studies from other countries that have analysed similar barriers to deployment of low carbon technologies and identified solutions to address them.

4. Assess the significance of barriers affecting deployment of key technologies over the coming decade and how these can be addressed. Table 12 in the Appendix outlines a simple framework that can be used for this purpose.

5. Undertake a skills and workforce readiness assessment to identify critical skill needs to support the transition.

6. Consider assessing Technology Readiness Level (TRL) and Commercial Readiness Index (CRI) to identify the stage of technology and market maturity for priority technologies that are new to the domestic market. See the Tools and Resources section below for links to resources to support analysis of the Technology Readiness Level and Commercial Readiness Index. This is useful to inform understanding of financial sector readiness (Part 3, Activity 2) and ‘just transition’ planning (Part 4, Activity 3).

7. Draw on industry experts to identify where enabling infrastructure is needed to deploy priority technologies at scale and what additional investment and policy adjustment is required to support this.

8. Create an action plan to define how and over what time horizon key barriers and skills needs will be addressed.

THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:

+ An assessment of barriers affecting deployment of priority technologies and possible solutions to address those barriers to inform Part 3, Activity 3.

+ Assessment of the technological and/or commercial ‘readiness’ of priority technologies to inform Part 3, Activity 2 (Assess financial sector readiness).

+ An assessment of workforce and skills gaps to inform policy package design (Part 4, Activity 1) and ‘just transition’ planning (Part 4, Activity 3).

+ An assessment of enabling infrastructure requirements critical to the deployment of priority technologies to inform development of public investment plan (Part 5, Activity 2).

+ An action plan to address key barriers.
TOOLS & RESOURCES

Note: while a number of the tools below focus on renewable energy technology, the methodology can be applied to any low carbon technologies.

+ **Commercial readiness index for renewable energy technologies**
  Australian Renewable Energy Agency (ARENA) 2014.
  Outlines an approach for assessing technology and commercial readiness for clean energy technologies.

+ **Innovation gaps framework**
  IEA n.d.
  Provides a framework for assessing technology readiness, and demonstrates how this has been applied to renewable energy technologies.

+ **Technology readiness level: Guidance principles for renewable energy technologies**
  Provides guidance on the use of technological readiness level frameworks for renewable energy technologies.

+ **Renewable readiness assessment**
  IRENA 2013.
  A country-led consultation process developed by the International Renewable Energy Agency to determine appropriate policy and regulatory choices and ensure the broadest possible buy-in from stakeholders.

+ **Anticipating skill needs for the low carbon economy? Difficult, but not impossible**
  International Labor Office (ILO) n.d.
  Describes the challenges in identifying green skills needs, and suggests research questions and appropriate methodologies to help with the process.

+ **Comparative analysis of methods of identification of skill needs on the labour market in transition to the low carbon economy**
  ILO 2011.
  Describes qualitative and quantitative methodological approaches to identify and address skill needs.

+ **Infrastructure prioritisation framework**
  World Bank 2016.
  A multi-criteria infrastructure decision support tool that considers social-environmental and financial-economic outcomes. The framework can be used to combine selection criteria from both social-environmental and financial-economic indices into a single means of selection.

+ **Assessment framework**
  Infrastructure Australia 2018.
  Appendix D4.6 may be used as a guide for considering and assessing infrastructure projects in a variety of scenarios, including 1.5 and 2 degree scenarios.

+ **Climate technology centre and network**
  Supports developing country governments at no cost with technical assessments, including technical expertise and recommendations related to specific technology needs, identification of technologies, technology barriers, technology efficiency and the piloting and deployment of technologies.

+ **UNDP technology readiness discussion paper**
  UNDP 2013.
  Presents a framework for understanding what it means for developing countries to be ready for technology transfer and development in the context of their efforts to identify and address their climate change mitigation and adaptation needs.
PART 3, ACTIVITY 2

Understand finance sector readiness to deploy capital at scale.

OVERVIEW

To achieve green growth, ‘an economy must support a growth dynamic that catalyses investment and innovation in new technologies, services and infrastructure that will underpin growth that makes a more sustainable claim on natural resources while addressing poverty reduction and social equity considerations’ (OECD 2011).

An understanding of finance sector readiness – both private sector and government – is key to identifying the interventions needed to enhance the enabling environment to attract and deploy both domestic and foreign investment at scale. It can also help governments to understand the role that different financial actors should play in closing the green infrastructure investment gap. Key financial actors include:

+ **Governments**: Central banks and financial service regulators
+ **State-run financial institutions**: national development banks, state-owned banks and state-owned institutional investors (pension funds, insurance, guarantees)
+ **Development finance institutions (DFIs)**: official development assistance, bilateral and multilateral development banks
+ **Private sector**: Commercial banks and institutional investors (pension funds, insurance companies, sovereign wealth funds).

Steering private sector investment towards low carbon technologies and infrastructure is critical for the transition, both to ensure sufficient capital can be deployed where and when it is needed, but also because of the risks faced by private sector financial institutions.

First, climate change impacts can affect financial stability by negatively affecting the creditworthiness of borrowers or projects which affect a banks’ credit risk. Second, climate change impacts can affect the profitability of insurance offerings. Given the potential impact on banks’ loan default rate and potential implications for financial stability, it is important to incorporate climate-related criteria into banks’ decision making.

The following barriers typically prevent more accurate accounting for risks and opportunities in investment assessments (UNEP et al. in OECD, World Bank, UN Environment Program 2018, and OECD 2015a):

+ **RISK PRICING**: Risk pricing is often disconnected from climate-related factors, due to a lack of comparable climate-related data and metrics; weak or non-existent pricing of negative externalities; lack of clear standards and definitions of low-emission, resilient infrastructure; and limited financial data or a detailed track record on the financial performance of low-emission, resilient infrastructure projects.
PART 3, ACTIVITY 2

+ **CAPABILITIES:**
  Investors tend to invest in what is familiar to them. There is a need to enhance climate-related capabilities across the investment value chain to improve decision making and break behavioural biases.

+ **BIASED INCENTIVES:**
  Incentives, institutional norms and regulations that favour short-termism and incumbent technologies or inefficient resource use need to be addressed to increase the take up of low emission technologies and infrastructure projects.

+ **ERRATIC POLICY AND REGULATORY ENVIRONMENT:**
  Policy uncertainty is a key barrier to investment, particularly for long-lived infrastructure investments.

Other factors also shape both private investor and development finance institution views of project ‘bankability’ (Nassiry et al. 2016; Figure 8), many of which are acutely felt in a developing country context.

Table 5 describes four components that assess a country’s ability to plan for, access, deliver, monitor and report on climate finance, both international and domestic, in ways that are fully integrated with national development priorities.

The participation of key financial actors (see Table 13 in the Appendix) will help to reach the scale of investment required over the coming decade to achieve climate and sustainable development goals (Bielenberg et al. 2016).

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**FIGURE 8: KEY FACTORS THAT SHAPE VIEWS OF BANKABILITY**

(SELECT: ODI ANALYSIS IN NASSIRY ET AL. 2016, P. 17).

**TABLE 5: COMPONENTS OF CLIMATE FINANCE READINESS**

(VANDEWEERD, GLEMAREC & BILLETT 2015, P. 5).

<table>
<thead>
<tr>
<th>FINANCIAL PLANNING</th>
<th>ACCESSING FINANCE</th>
<th>DELIVERING FINANCE</th>
<th>MONITOR, REPORT &amp; VERIFY</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Assess needs and priorities, and identify barriers to investment</td>
<td>+ Directly access finance</td>
<td>+ Implement and execute project, program and sector-wide approaches</td>
<td>+ Monitor, report and verify flows</td>
</tr>
<tr>
<td>+ Identify policy mix and sources of financing</td>
<td>+ Blend and combine finance</td>
<td>+ Build local supply of expertise and skills</td>
<td>+ Use performance-based payments</td>
</tr>
<tr>
<td></td>
<td>+ Formulate project, program and sector-wide approaches to access finance</td>
<td>+ Coordinate implementation</td>
<td></td>
</tr>
</tbody>
</table>

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**KEY DRIVERS OF ‘BANKABILITY’**

- Investment mandate of investors
- Technology risk
- Foreign currency risk
- Policy reversal / political risk
- Poor / incomplete preparatory reports
- Solvency of counterpart or off-taker
- Scale / complexity of execution
- Uncertain end-user demand / ability to pay
- Legal / regulatory environment
- Liquidity
CASE STUDY

CLIMATE FINANCE READINESS NEEDS IN NAMIBIA

In Namibia, stakeholder consultation identified the following activities to strengthen the readiness for climate finance:

+ Support efforts to link the climate change considerations outlined in the national climate change policy and strategy with national development plans and sector strategies through:
  - a work program to explore options for integrating climate change into sector and national development plans, and develop a project pipeline
  - developing simple tools that can be applied in key sector ministries to understand the climate implications of policies and proposed investments
  - raising awareness of the material implications of climate change for investment choices in key sectors and the institutions and systems to support investment in climate change solutions through knowledge exchange with peer countries.

+ Address a general shortage of technical human capacity, particularly within government, through:
  - strengthening coordination of activities across government on issues of climate change to leverage the technical capacity already developed
  - establishing and strengthening climate change focal points within ministries
  - enhancing climate change coordination, awareness and capacity at regional and local level
  - establishing a centralised climate data repository to gather data on climate change vulnerability in a consistent and centralised manner.

+ Improved prioritisation and costing of proposed activities, by:
  - highlighting climate-related risks and opportunities and strengthening due diligence for private investors and financial institutions working in key sectors
  - exploring the viability of various financial instruments to enable execution of the national climate change policy and strategy.
  - assessing and strengthening institutional capacity to effectively deploy international climate finance
  - strengthening capacity to monitor and evaluate the outcomes of climate finance based on the achievement of results.

Source: van Rooij et al. 2013, pp.26-31
PART 3, ACTIVITY 2

APPROACH

1. Review any existing work that may have been completed, such as:
   + mapping of existing finance flows (Part 1, Activity 4)
   + estimated investment needs over time at economy-wide and sector level (Part 2, Activity 2)
   + prioritised actions (Part 2, Activity 6)
   + review of public and private finance-sector climate-related risks from Part 2, Activity 5
   + replicable experience or case studies of financing instruments for priority technologies or sectors
   + successful case studies of bankable projects (i.e. project preparation phase and financial close).

2. Assess the country’s readiness to attract and deploy capital in transformative ways, drawing on any of the approaches to assessing climate finance readiness included in the Tools and Resources section below.

3. Identify financial barriers affecting the readiness of the finance sector to meet future investment needs and the role of key actors in overcoming these barriers (see Table 13 in the Appendix) to inform Part 4, Activity 2 (Reform financial sector policies).

4. Assess factors affecting accurate accounting for risks and opportunities in investment assessments (for example, inadequate risk pricing, capability limitations, biased incentives, policy uncertainty).

5. Identify areas where capacity needs to be built to enable deployment of these financial instruments, and update the technical assistance needs assessment (Part 1, Activity 5).

6. Identify where capability gaps exist across the financial sector, and develop work programs to address these gaps (or build into Part 1, Activity 5 (Assess technical assistance needs)).

THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:

+ Climate finance readiness assessment to identify areas for institutional strengthening and technical assistance for input to Part A, Activity 5 (Evaluate needs for technical assistance).

+ Analysis of policy, regulatory and risk-related barriers affecting private sector readiness to deploy capital for priority actions to inform Part 4, Activity 2 (Reform financial sector policies to scale up low carbon, climate resilient investment).

+ Assessment of public and private capability gaps.
TOOLS & RESOURCES

+ **Readiness for climate finance**
  UNDP 2012.
  Supports understanding of ‘readiness’ to use climate finance in a transformative way at the national level. In the context of the financial challenges posed by climate change, including the scale of financing required and the barriers to the effective use of climate finance (international and domestic; public and private), the paper presents a four-part framework through which to understand the different components of readiness and the specific capacities needed to underpin it.

+ **Climate finance readiness training (CLiFiT)**
  GIZ n.d.
  A dynamic, interactive approach to raising awareness and capacity-building among public bodies in developing countries and emerging economies. The overall objective of the training is to provide tailor-made support, strengthening the ability of countries to build a coherent national framework for climate finance, access international climate finance and spend funds in an effective and transparent manner.

+ **Climate finance: Readiness and strengthening institutions**
  Overseas Development Institute (ODI) 2012.
  Based on a technical expert meeting that explored the requirements of ‘readiness’ for climate finance and the opportunities and limits of ‘readiness’ from a conceptual perspective, drawing on a growing body of work to understand these issues. The paper synthesises key themes and takeaway messages.

+ **Clean energy finance & investment mobilisation (CEFIM)**
  OECD.
  The program aims to strengthen domestic enabling conditions to attract finance and investment in renewable energy and energy efficiency in buildings in five emerging economies in Latin America and Southeast Asia. The program supports the development of a Clean Energy Finance and Investment Review, provides support for policy development and the design of financing instruments, and facilitates matchmaking and peer learning.

+ **Policy framework for investment**
  OECD 2015.
  Provides guidance across twelve policy fields that are critical for improving the enabling environment to attract investment.
PART 3, ACTIVITY 3

Assess current policies and initiatives, and identify policy gaps.

‘Action on climate change can generate inclusive economic growth in the short term, in addition to securing longer-term growth and well-being for all citizens. Governments can not only build strong growth but also avoid future economic damage from climate change if they collectively act for a ‘decisive transition’ towards low carbon economies. This requires combining climate-consistent, growth-enhancing policies with well-aligned policy packages for mobilising investment in low-emission infrastructure and technologies.’

(OECD 2017, p.19)

OVERVIEW

Unlocking investment involves removing sector-specific barriers, whether policy-induced or specific to the market structure of each sector. It will also require policies that ensure that returns to investors incentivise investment (OECD 2015a).

Another factor is policy certainty. Confidence in policy change can be built through consultations with the private sector, workers’ organisations and other stakeholders in the drafting phase. Investors also need confidence that the rule of law will be upheld and that disputes with commercial partners or with the government will be handled fairly, with respect for the rights of the investor. (OECD 2015a).

This activity is intended to help governments to evaluate current policies and their effectiveness in supporting deployment of the priority low carbon technologies identified in Part 2. It seeks to help governments understand where policy gaps exist that need to be addressed so that low carbon technologies and infrastructure attract investment and scale up over the coming decade.

This activity also requires an assessment of the sectoral policies, institutions and domestic capital market regulatory context in which investors make their decisions. This includes (Bielenberg et al. 2016):

+ SECTORAL POLICIES: the rules, standards and incentives that provide the framework for specific industries, such as energy.

+ INSTITUTIONS: the legal and regulatory policies that define how business is done, including those concerning corruption, property rights and foreign investment.

+ DOMESTIC CAPITAL MARKETS: the structures that channel domestic finance and investment. Domestic capital markets can be enhanced by removing policies and regulations that restrict investment, promoting mechanisms for investment and creating preferences for local players.
CASE STUDY

NAURU’S CLIMATE CHANGE FINANCE ASSESSMENT

In 2012, the Pacific Islands Forum Secretariat undertook a national climate change finance assessment to support the government of Nauru to make informed decisions on measures to improve access to and management of climate change resources. This assessment drew upon the Pacific Climate Change Financing Assessment Framework, which sets out a comprehensive method to assess issues relating to climate change finance and a country’s ability to access and manage climate change resources against six interrelated dimensions: funding resources, policies and plans, institutions, public financial management and expenditure, human capacity, and development effectiveness.

The policy and planning analysis included in the assessment provides an understanding of the mix of policies and plans that guide Nauru’s climate change work program, outlines the key priorities of the government in effectively responding to climate change, and identifies the strength and the gaps of existing policy and processes for development, review and implementation of these policies and plans.

The policy and planning analysis process began assessing national strategies to identify the overarching goals and objectives. It then assessed sector and thematic strategies such as the Nauru Economic Infrastructure Strategy and Investment Plan to identify priorities for infrastructure investment and gaps where climate change considerations could be better integrated into infrastructure designs and sectoral policies and planning.

Such an analysis provides a strong foundation for strengthening institutional arrangements, understanding public financial management and expenditure and identifying needs for development assistance.

Source: Pacific Islands Forum Secretariat, 2013, p.11.
PART 3, ACTIVITY 3

APPROACH

1. Review any existing work that may have been completed, such as:
   + barriers and ‘readiness’ assessments undertaken in Part 3, Activities 1 and 2
   + climate change mitigation and sectoral policies
   + industry policies at upstream (that is, extraction, plantation) and downstream (that is, manufacture) levels
   + trade policies, such as trade barriers (tariff and non-tariff), trade incentives, import substitutes
   + assessment of policies related to investment competitiveness or foreign direct investment
   + education and skills policies.

2. Update or undertake an assessment to identify the relevant policy, market and social context for each sector, existing sectoral and jobs/employment strategies and key decision-makers.

3. Update or undertake reviews of existing government policies and programs, with a focus on areas relevant for priority actions identified in Part 2, Activity 6 (Prioritise actions).

4. Assess effectiveness of existing policies and programs to address barriers identified in technology and finance sector barriers assessment (Part 3, Activities 1 and 2).

5. Identify key gaps where existing policies and programs need to be strengthened to achieve short- and medium-term priority actions.

THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:

+ Policy effectiveness evaluation to identify key areas to be addressed in Part 4 (Formulate the policy package).
Tools & Resources

- **Approach to assessment of policy effectiveness**
  UNEP 2019.

- **Policy framework for investment**
  OECD 2015.
  Chapter 12: Investment framework for green growth includes a series of questions that can support governments to evaluate how conducive the national policy environment is to green investment.

- **Aligning policies for the transition to a low carbon economy**
  OECD 2015.
  Provides a diagnosis of misalignments between overall policy and regulatory frameworks and climate goals, and identifies a number of opportunities for realigning policies to enable the shift to a low carbon economy.

- **ICAT series of guidance documents**
  Initiative for Climate Action Transparency (ICAT) 2019.
  Aims to support transparency and ambitious climate action by providing methods and guidance for the assessment of the greenhouse gas, sustainable development and transformational impacts of policies and actions.

- **Regulatory indicators for sustainable Energy (RISE)**
  RISE is a set of indicators to help compare national policy and regulatory frameworks for sustainable energy. It assesses countries’ policy and regulatory support for each of the three pillars of sustainable energy — access to modern energy, energy efficiency and renewable energy. RISE is built on a wealth of empirical evidence that shows that policies and regulations matter when countries are seeking to attract investment in sustainable energy.

- **Environment and climate policy evaluation**
  Although targeted at the European environmental evaluation community, the report outlines an approach to evaluating environmental policy, and includes a toolbox for evaluators.

- **Governmental processes facilitating infrastructure project preparation**
  A country-lens approach, involving a review and profiling of project preparation processes in 15 countries, was adopted to identify and incorporate leading practices. These case studies were selected from economically and geographically diverse countries that illustrate lessons learned about project preparation processes globally.
FORMULATE THE POLICY PACKAGE TO ENHANCE THE ENABLING ENVIRONMENT

ACTIVITY 1:
Understand finance sector readiness to deploy capital at scale.
Tools and resources

ACTIVITY 2:
Reform financial sector policies to scale up low carbon, climate resilient investment
Tools and resources

ACTIVITY 3:
Formulate transition measures for emissions-intensive regions and industries
Tools and resources
Part 4. Formulate the policy package to enhance the enabling environment.

This part outlines the process of formulating a policy package to mobilise technologies and markets for the transition ahead, building on the analysis of the current policy context and gaps, as well as technology and market readiness, collected in Parts 2 and 3. Best-practice would also consider adaptation investment needs as part of the policy package.

Also included in this part is the development of a policy package for financial sector readiness, to mobilise both foreign and domestic private sector investment in climate technologies and infrastructure. Governance structures will also play an important role in investment decisions, particularly the system’s reliability in settling business disputes (Shapiro 2011).

Ministries of finance are among the leading actors responding to the call for countries to create an investment environment that facilitates the flow of money consistent with the Paris Agreement. When shaping policy packages, coordination between the ministry of finance, ministry of industry, ministry of trade, ministry of labour and other ministries related to infrastructure and judicial systems will be key (Cochran & Pauthier 2019, p. 20).

The policy package should touch on structural reforms that can promote higher and more
inclusive growth, including enhancing market competition, facilitating access to jobs and improving skills. The policy package should also consider measures to improve dynamism in the labour market, boost investment in research and development (R&D) and encourage other forms of knowledge-based capital to improve adoption of new low carbon technologies and long-term productivity growth. Government efforts to accelerate innovation and commercialisation of new technologies can deliver mitigation outcomes faster and at lower cost. (OECD 2017, p. 30).

Foreign direct investment (FDI) could provide the above benefits in one package. Foreign direct investment may create quality and value-adding jobs to enhance the skill base of the domestic economy, facilitate the transfer of technology and knowledge, boost competitiveness of domestic firms and enable access to markets.

Finally, when developing policy packages, governments must also consider support for highly affected industries, regions and segments of the community. This ensures measures are put in place to mitigate any negative impacts of the transition, by supporting alternative industries and job creation, as well as affected stakeholder groups such as the lowest income households or marginalised communities.
PART 4, ACTIVITY 1

Understand finance sector readiness to deploy capital at scale.

OVERVIEW

This activity focuses on identifying areas for policy refinement or reform in order to unlock the required investment over coming decades.

Governments have options for developing policies that range from market-based to regulatory to voluntary (Table 6). Often a combination of two or more types creates the best outcome. For example, a tax exemption followed by a regulation on technology standards could improve innovation growth in an industry, while an accompanying voluntary-based policy on labelling of emissions content or energy efficiency could work well on the demand side, especially as consumer awareness rises.

Whichever combination governments pursue, it is imperative to maintain alignment between climate and economic goals. Governments face a constant challenge in stimulating or maintaining robust economic growth and addressing systemic risk and instability in the finance sector while ensuring investment in the economy.

<table>
<thead>
<tr>
<th>MARKET-BASED</th>
<th>REGULATORY</th>
<th>VOLUNTARY</th>
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<tbody>
<tr>
<td>+ carbon pricing, pollution taxes</td>
<td>+ technology standards</td>
<td>+ disclosure of emissions, risk exposure</td>
</tr>
<tr>
<td>+ fossil fuel subsidy reform</td>
<td>+ fossil fuel subsidy reform</td>
<td>+ labelling of emissions content, energy efficiency performance</td>
</tr>
<tr>
<td>+ feed-in tariffs/auctions</td>
<td>+ feed-in tariffs/auctions</td>
<td>+ technology standards</td>
</tr>
<tr>
<td>+ grant support, technology subsidies</td>
<td>+ feed-in tariffs/auctions</td>
<td>+ fuel quality standards</td>
</tr>
<tr>
<td>+ tax credits, allowances, exemptions</td>
<td>+ renewable energy targets</td>
<td>+ energy efficiency targets, performance standards, mandatory energy audits</td>
</tr>
<tr>
<td>+ border tax adjustments</td>
<td>+ renewable energy targets</td>
<td>+ net metering</td>
</tr>
<tr>
<td>+ pollution caps</td>
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CLIMATEWORKS AUSTRALIA
They also must address slowing productivity, growing inequality in wealth distribution and persistent poverty, with climate change a pernicious part of these challenges (OECD, IEA, NEA & ITF 2015).

A successful policy framework must have three components: a well-aligned investment environment, pro-inclusive growth structural reform and climate-targeted policies (OECD 2017, p. 31).

Given the need to significantly scale up market and technology innovation to solve climate change, governments should consider including innovation enablers in their policy packages. For developing economies, this can help to position them well for the ‘green race’ ahead. Much as the industrial revolution rewarded early adopters, countries that get a head start in innovation and production of low carbon technologies will be the major economies of tomorrow (OECD, The World Bank & UN Environment 2018; ClimateWorks and Vivid Economics 2019).

Innovation enablers include:

+ deploying targeted innovation policies to create and shape markets for climate innovations
+ scaling up public investment in R&D to create the next generation of climate solutions
+ targeted intervention to address the financial barriers to demonstration and early-stage commercialisation to bring existing technologies to scale
+ promoting international technology diffusion, which creates new markets for domestically produced technologies, while ensuring that innovation benefits all.

THE ROLE OF CARBON PRICING POLICIES IN ENABLING THE TRANSITION

Carbon pricing is a key part of the policy response to climate change. It corrects market distortions by implementing a ‘polluter pays’ principle. It drives large efficiency gains and goes hand-in-hand with industrial modernisation and greater competitiveness. When carbon markets are linked, these efficiency gains are magnified.

Carbon pricing approaches include both carbon taxes (directly setting a tax rate on greenhouse gas emissions or, more commonly, on the carbon content of fossil fuels) and emissions trading schemes (where emitters can trade emissions units to meet their emissions targets, allowing companies to either implement internal abatement measures or to acquire emissions units in the carbon market, if cheaper to do so).

Carbon pricing also raises revenues for governments. In 2018, governments raised more than US$44 billion that could be used for public expenditure. Carbon pricing revenues can mitigate the impact of carbon pricing on households and businesses by reducing other taxes, funding efficiency upgrades to lower energy bills or providing other forms of direct financial support.

Carbon pricing program have been implemented or scheduled in 46 countries. Once China’s carbon trading system is up and running, 20 per cent of global emissions will be covered by carbon pricing.

Carbon pricing works best when accompanied by other policies and spending that supports social and developmental goals, guaranteeing a just transition for workers and communities most affected by its introduction.
CASE STUDIES

ANALYSIS OF GOVERNMENT TRANSFERS OF FOSSIL FUEL SUBSIDIES IN ECUADOR

In Ecuador, removing fossil fuel subsidies would free up public revenues of more than US$2.3 billion annually. Increasing the existing cash transfer BDH (Human Development Grant) for current recipients by about US$13.1 for diesel, US$11.2 for electricity and US$15.6 for LPG, would be sufficient to compensate the poorest 40% of households for adverse effects.

To compensate for higher gasoline prices, only about US$6.1 of additional cash transfer would be required. More than 75% (gasoline), nearly 60% (electricity and diesel) or 37% (LPG) of the freed-up revenues could be used for other public spending or for reducing the public deficit.

Additional revenues from subsidy removal could be utilised in an even more progressive manner by expanding the BDH to non-beneficiaries or by introducing a minimum pension. Energy subsidy reforms could finance free health care and support food stamps for the poorest 40% of the population.

Source: Schaffitzel et al. 2019

CARBON PRICING AS A POLICY INSTRUMENT IN CHILE

On 1 January 2017, Chile became the first country in South America to implement and collect a carbon tax, levying US$5/tCO2e for large industrial and power generation sources as part of a broader tax reform package.

The annual tax revenue from the carbon tax is approximately US$160 million, a small portion (<2%) of the expected US$8.3 billion raised from a broader tax reform package. These tax revenues flow to the Ministry of Finance’s General Treasury of the Republic, with the largest share of the revenues proposed to be spent on improvements to the education system.

The carbon tax is one facet of a broader effort by the Chilean government to transition to (and pioneer) sustainable energy practices in light of the tremendous environmental risk posed by climate change given Chile’s coastal, low-lying geography. Related tools and policies include Chile’s National Greenhouse Gas Inventory System, National Climate Change Action Plan 2016-2021 and Energy Policy 2050.

Source: Bose et al. 2019, pp. 33-38
APPROACH

1. Review any existing work that may have been completed, such as:
   + Outputs from Part 3, Activity 3 (Assess current policies and existing initiatives, and identify policy gaps) in particular:
     - fiscal and financial incentives to targeted industries
     - industry policies at upstream and downstream
     - trade policies, such as trade barriers (tariff, non-tariff), trade incentives, import substitutes
     - labour policies.
   + Analysis of the impacts of a carbon price on the economics of climate action in your country, such as through the World Bank’s Partnership for Market Readiness.

2. Identify specific objectives for policy package development, such as:
   + identifying the role of carbon pricing policies (see ‘The role of carbon pricing policies in enabling the transition’ in the Overview section above)
   + implementing effective fossil fuel subsidy reforms
   + building the skills and workforce to deploy new technologies
   + enhancing foreign direct investment attractiveness
   + increasing market and technology innovation to create economic growth opportunities
   + using trade policy to scale up market development for low carbon technologies.

3. Drawing on the outputs of Part 3, Activity 3 (Assess current policies and existing initiatives), identify areas for policy reform and proposed reforms.

4. Prioritise which regulatory changes will be part of the policy reform package.

5. Based on this analysis, identify the right policy mix and develop a policy reform implementation plan.

THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:

+ Agreed and actionable work plans for targeted policies to be refined, including which government institutions will lead the revision of each policy.
Tools & Resources

+ Database on policy instruments for the environment
  OECD n.d.
  A unique database that gathers key quantitative and qualitative information on six types of policy instruments, in more than 90 countries.

+ MCA4Climate
  UNEP n.d.
  A guide to possible climate policy options and measures across 12 mitigation and adaptation areas. It includes a policy evaluation framework for analysing proposed climate policies based on a multi-criteria analysis approach to ensure that action is compatible with development objectives and contributes towards more sustainable future pathways.

+ Instrument mixes for environmental policy
  OECD 2007.
  The case studies analyse instrument mixes applied in OECD countries to address household waste, non-point sources of water pollution in agriculture, residential energy efficiency, regional air pollution and mercury emissions.

+ RETScreen
  Natural Resources Canada.
  A tool designed to analyse the viability of clean energy projects, but also useful for planning, designing, implementing and reviewing the viability of clean energy policies. RETScreen allows participants in the policy process to consider the technology, business and finance of clean energy in an integrated fashion, thus helping to develop appropriate – and ultimately, successful – policies.

+ Effective carbon rates 2018
  OECD 2018.
  The most detailed and most comprehensive account of how 42 OECD and G20 countries – responsible for around 80% of global carbon emissions – price carbon emissions from energy use. The effective carbon rate is the sum of taxes and tradable permits that put a price on carbon emissions.

+ Report of the High-Level Commission on Carbon Prices
  This report has been prepared based on the commission’s assessment of the available evidence and literature as well as on its members’ judgment, developed through their extensive international policy experience.

+ Policy guidance for investment in clean energy infrastructure
  OECD 2015.
  Provides a checklist to help governments increase investments in renewable energy.

+ Partnership for market readiness
  technical papers
  World Bank.
  A series of papers on carbon price related topics, including the communication of carbon pricing, methods of ensuring credibility for carbon pricing instruments and ways of using carbon revenues.

+ Friends of fossil fuel subsidy reform
  FFFSR 2020.
  An informal group of non-G20 countries working to build political consensus on the importance of fossil fuel subsidy reform.

CONT.
TOOLS & RESOURCES (CONT.)

+ Improving the environment through reducing subsidies
  OECD 1998.
  Summarises the results of an OECD study on how economic support measures actually affect the economy and, as a result, the environment.

+ ESMAP support helps Ukraine reform its subsidies
  Explains how the Energy Sector Management Assistance Program has helped Ukraine increase its gas and district heating tariffs, bringing the gas sector into surplus and increasing the number of beneficiaries of the Housing and Utilities Subsidy program.

+ Environmental fiscal reform
  OECD 2017.
  This report discusses several aspects of, and experiences with, environmental fiscal reforms.

+ Can government transfers make energy subsidy reform socially acceptable?:
  A case study on Ecuador
  IADB, 2019.
  The analysis looks at how a fraction of financial resources freed up by subsidy reform in Ecuador could be used to benefit poor households while also delivering significant benefit to the public budget.

+ Managing the distributional effects of energy taxes and subsidy removal in Latin America and the Caribbean
  IADB 2018.
  This study looks at how recycling a small fraction of fiscal revenues from energy subsidy removal or energy taxation could be sufficient to compensate vulnerable households from the effects of price increases.
PART 4, ACTIVITY 2

Reform financial sector policies to scale up low carbon, climate resilient investment.

‘Countries need to devise their own strategies for green investment, which need to be tailored to their specific circumstances, needs and priorities. Ways of promoting green investment depend on policy and institutional settings, levels of development, natural resource environmental pressure points, as well as political will and leadership to set priorities.’

(OECD 2015a, p. 129).

OVERVIEW

This activity is intended to help governments roll out financial sector policy improvement to speed up climate compatible investment.

Mobilising climate finance requires a range of financial instruments tuned for infrastructure financing. These need to cover different sectors and consider risk allocation and mitigation, to enable public financial institutions to shift towards low carbon investment and ensure a financial system that correctly values climate risk.

It is estimated that, globally, the asset value at risk from climate change ranges from US$4.2 trillion to US$43 trillion between now and 2100 (The Economist Intelligence Unit 2015). Much of the risk will come through weaker growth and lower asset return. In the long run, organisations that invest in non-viable (carbon-intensive) activities may suffer during the transition to a low carbon climate resilient economy and their investors will likely experience lower returns.

Yet the current approach to company valuations does not adequately factor in climate-related risks. Markets need more information on these risks – along with low carbon opportunities – to improve financial allocation decisions by investors, lenders and insurers. Regulators also need this information to avoid potentially significant impacts to the financial system due to crises and sudden losses in asset values.

Enhancing market transparency and improving data on performance, risks, costs and opportunities of low-emission and resilient investments are also essential for promoting sustainable infrastructure as an asset class and leveraging long-term investment opportunities (OECD/World Bank/UN Environment Program 2018).

Governments play a role in facilitating access to climate-related information by introducing or extending mandatory disclosure policies that include climate-related risk disclosure and exploring and developing best-practice reporting mechanisms. Where carbon reporting is mandatory, the government can facilitate the alignment of reporting with the Task Force on Climate-related Financial Disclosures (TCFD) recommendations.
Climate change is a source of structural change affecting the financial system. It is therefore important to ensure that central banks adjust risk assessment criteria to account for climate-related risks that are not fully reflected in asset valuations.

This activity will provide governments with the opportunity to consider:

+ the role of central banks and financial regulators in greening the economy and in safeguarding the financial system against climate-related risks
+ the main climate-related risks to a country’s financial sector, and their potential impact
+ the measures that financial sector organisations can take to respond to these risks
+ policy and regulatory adjustments needed to overcome barriers to sustainable investment
+ the role of public finance instruments such as revenue instruments and fiscal transfers in creating incentives for private sector investment (see also Part 5, Activity 2 on directing public finance towards investment).

Governments should ensure participation from the private sector – institutional investors, banks, project developers – in undertaking this activity, as well as relevant ministries in affected sectors. Collaboration between policymakers, central banks, financial service regulators and the financial sector can be particularly important for:

+ harmonising ‘green’ taxonomies: Emerging taxonomies are needed to provide standards and definitions of what constitutes sustainable investment to enhance financial disclosure and comparability across industries, and to avoid ‘greenwashing’.

+ improving the functioning of financial markets through information disclosures: Markets need information to assess which companies are expected to grow in a low carbon economy, which are strategically resilient to physical/transition risks from climate change and which companies face transition risks.
+ supporting industry to build capacity and develop best-practices to speed up the transition: Fiscal authorities, financial service regulators and central banks can work with firms across the financial system to ensure exchange of best practices, support capacity-building (especially in areas of financial impact of climate-related risks to business), increase utilisation of scenario analysis and stress-testing tools, and develop and test new financial products.

Governments have a range of policy measures at their disposal to steer the finance sector towards low carbon investment, as illustrated in Table 7.

### TABLE 7. A RANGE OF POLICY INTERVENTIONS CAN FACILITATE THE SCALE AND PACE OF CLIMATE RESILIENT, LOW CARBON INVESTMENT

<table>
<thead>
<tr>
<th>BUDGETING AND FISCAL MANAGEMENT AUTHORITIES</th>
<th>CENTRAL BANKS AND FINANCIAL SERVICE REGULATORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Paris-aligned GHG targets through long-term strategy, NDC and sectoral/national plans.</td>
<td>+ Define green investment taxonomies.</td>
</tr>
<tr>
<td>+ Re-oriented/increased spending on priority sectors through national budget/overseas development assistance (ODA).</td>
<td>+ Increased disclosure (such as TCFD) and stress-testing.</td>
</tr>
<tr>
<td>+ Fiscal policy instruments such as carbon pricing, feed-in tariffs, renewable energy auctions.</td>
<td>+ Improved integration of climate change risks/opportunities into risk assessment methodologies and fiduciary duties.</td>
</tr>
<tr>
<td>+ Compensation measures for highly affected sectors/regions through transition measures.</td>
<td>+ Green prudential policies.</td>
</tr>
<tr>
<td>+ Clean technology policies.</td>
<td>+ Green credit allocation.</td>
</tr>
<tr>
<td>+ Increased availability of concessional finance through blended finance structures.</td>
<td>+ Monetary policy.</td>
</tr>
<tr>
<td></td>
<td>+ Harmonised policy for international capital flows (taxation, reporting, currency hedging and interest rate caps).</td>
</tr>
<tr>
<td></td>
<td>+ Deepen local capital markets/pooling.</td>
</tr>
<tr>
<td></td>
<td>+ Drive development of financial products.</td>
</tr>
</tbody>
</table>
CASE STUDY

THE EU’S APPROACH TO HARMONISING DEFINITIONS OF GREEN TAXONOMIES

A ‘green’ or ‘sustainable’ finance taxonomy is a classification tool to help investors and companies make informed investment decisions on environmentally friendly economic activities. It is one of a suite of tools to help investors contribute to achieving climate targets through capital markets.

The European Union is developing the EU Taxonomy, which will be used by institutional investors and asset managers marketing environmentally sustainable investment products. Investors will be able to state that they are seeking to invest in taxonomy-eligible activities or disclose their own preferred approach to determine if their investment is environmentally sustainable. The taxonomy will help investors to:

+ save time and money for investors and issuers
+ support different investment styles and strategies
+ put environmental data into context
+ avoid reputational risks
+ reward companies who prioritise green investment products.

Source: EU Technical Expert Group on Sustainable Finance 2019
APPROACH

+ Review any existing work that may have been completed, such as:
  - identification of the main climate-related risks to a country’s financial sector, and their potential impacts, from Part 2, Activity 4.
  - case studies on harmonising ‘green taxonomy’.
  - quantitative and qualitative climate-risk assessments for central banks, as well as other tools to assess financial risks.
  - scenario analysis to help supervisors assess how climate change will impact the macroeconomy, financial system and financial institutions, from Part 2, Activity 5 (Consider long-term risks and opportunities).
  - analysis of the impacts of a carbon price on the economics of climate action in your country, such as through the World Bank’s Partnership for Market Readiness.

+ Draw on results from Part 2, Activity 5 to identify the main climate-related risks to your country’s financial sector, and potential impacts.

+ Facilitate collaboration between policymakers, central banks, financial service regulators and the financial sector, in order to:
  - harmonise ‘green’ taxonomies
  - enhance information disclosures. This should consider which metrics are most useful for different levels of assessment (microprudential, macroprudential and macroeconomic).
  - identify areas for capacity building and exchange of best-practice.

+ Consider the role of financial service regulators to improve micro- and macroprudential regulations and credit allocation:
  - Green macroprudential policy can take the form of ‘brown’-penalising factors.
  - Credit allocation can take the form of limits on ‘brown’ commercial bank lending or quotas for ‘green’ lending, lower green reserve requirements/collateral frameworks, etc.

+ Consider the role of fiscal authorities in developing enabling policies:
  - Implementing greenhouse gas targets, carbon pricing, feed-in tariffs, and renewable energy auctions.
  - Re-orienting national budget towards priority sectors.
  - The Ministry of Finance should lead testing, harmonisation with sectoral regulations, and coordination with relevant ministries.

THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:
+ draft regulations
+ policy briefs
+ investment guidelines and definitions
+ series of stakeholder consultations
+ planned measures to overcome risk and barriers.
TOOLS & RESOURCES

+ **TCFD implementation guide**
  Climate Disclosure Standards Board 2019.
  By offering how-to guidance, this publication helps companies enhance the robustness, consistency, comparability and utility of Task Force on Climate-related Financial Disclosures implementation and reporting through SASB and CDSB’s market-tested frameworks, standards and resources.

+ **Storm ahead: A proposal for a climate stress-test scenario**
  2° Investing Initiative 2019.
  This report represents a ‘strawman’ for an adverse climate scenario that can be used by financial supervisors as inputs into either traditional or climate-specific stress tests of regulated entities.

+ **Basel III: International regulatory framework for banks**
  Bank for International Settlements (BIS) 2019 (revised ed.).
  Basel III is an internationally agreed set of measures developed by the Basel Committee on Banking Supervision in response to the financial crisis of 2007-09. The measures aim to strengthen the regulation, supervision and risk management of banks.

+ **Greening the banking system - experiences from the Sustainable Banking Network (SBN)**
  Identifies continuing barriers to sustainable banking, as well as critical success factors in the efforts to date. It closes with some options for consideration by the G20 Green Finance Study Group.

+ **The climate bonds taxonomy**
  Climate Bond Initiative 2019.
  A guide to climate-aligned assets and projects. It is a tool for issuers, investors, governments and municipalities to help them understand the key investments that will deliver a low carbon economy. The taxonomy is grounded in the latest climate science and has been developed through an extensive multi-stakeholder approach, leveraging the work of its technical and industry working groups.

+ **Green finance measures database**
  Catalogues more than 390 national and subnational policy and regulatory measures currently in place to support the development of green finance globally. Covers three asset classes of investment, banking and finance.

+ **Investing in climate, investing in growth**
  OECD 2017. ‘Chapter 5: Policies for scaling up low emissions resilient development’.
  Describes how coordinated policies, across climate and structural reforms, are required to trigger investment while stimulating economic growth.

+ **Policy Framework for Investment**
  OECD 2015a, ‘Chapter 12: Investment framework for green growth’.
  Focuses on policy tools for scaling up ‘green’ investment.

+ **Policy guidance for investment in clean energy infrastructure**
  OECD 2015.
  ‘Chapter 4: Financial market policy’ provides a series of questions to help governments enhance access to finance for renewable energy.

CONT.
FINANCING CLIMATE FUTURES

‘Chapter 5: Reset the financial system in line with long-term risks and opportunities’ outlines barriers and solutions to redirecting financial flows towards low carbon infrastructure.

CLEAN ENERGY FINANCE & INVESTMENT MOBILISATION (CEFIM)
OECD.

The program aims to strengthen domestic enabling conditions to attract finance and investment in renewable energy and energy efficiency in buildings in five emerging economies Latin America and Southeast Asia. The program supports the development of a Clean Energy Finance and Investment Review, provides support for policy development and design of financing instruments, and facilitates matchmaking and peer learning.

SOVEREIGN ESG DATA PORTAL
World Bank n.d.

Aims to channel capital into sustainable development by increasing transparency (as well as the quality and scope of environment, social and governance data for investors) at a country level. Comprising over 17 themes, covering all 17 Sustainable Development Goals and integrating 67 indicators, the portal will provide investors with improved visibility and transparency on a wide range of environment, social and governance risks associated with their investments. It includes environment, social and governance criteria on natural and human capital, energy use, corruption, migration, emissions and more.
PART 4, ACTIVITY 3

Formulate transition measures for emissions-intensive regions and industries.

OVERVIEW

‘Managed well, transitions to environmentally and socially sustainable economies can become a strong driver of job creation, job upgrading, social justice and poverty eradication.’

(International Labor Organization, 2015 in Smith 2017, p. 4)

The transition requires governments to not only think in terms of shifting to low carbon technologies and mobilising finance, but also to understand how the transition will affect key economic sectors, regions and vulnerable communities, identifying and supporting potential ‘winners’ and ‘losers’ in the transition, and demonstrating the actions taken and their successes (Zinecker et al. 2018).

This activity is aimed at identifying the stakeholders most affected by transition risks, the scale of impact, the measures needed to compensate or minimise these impacts, and their costs.

It also encourages governments to consider measures that can be put in place to support alternative industries and job creation to mitigate negative impacts of the transition. For example, IADB analysis on the labour impact of coal ‘phase down’ in Chile (Vogt-Schilb and Feng 2019) finds that 32,000-40,000 new jobs would be created by the transition, compared to 4000 jobs lost in the coal sector. Managed well, the transition would also generate US$1.8 billion of added value to the economy in 2030.

While stakeholder consultation is an important part of each part, a participatory and transparent process with workers and communities is key to ensuring a just transition in emissions-intensive sectors and regions (OECD 2017). This will help the government to anticipate, plan for and communicate the structural consequences of the transition as the national economy pivots away from emissions-intensive activities.

Some key principles to guide ‘just transition’ policy design include (Conway, n.d):

+ Anticipate and fund just transitions early, particularly in carbon-intensive industries: Upfront planning and cost are a key barrier to just transitions. Governments have an important role in funding transitions, but must work with the private sector to ensure transitions are fair and equitable. If left too late, companies in declining industries may be financially unable to support workers in the transition. Early preparation is also needed to tackle complex issues, such as the transformation of fossil fuel subsidies into just transition funding.

+ Plan for gaps in geography, timing and skills with new jobs: Even with adequate planning, governments cannot guarantee that phased-out jobs can be immediately replaced in the same location or at the same income level. Workers will need to be equipped with the right skill sets to take on new jobs, and policymakers
must understand that skills transfer is not always possible, even for occupations within a similar field. It is important to ensure that affected workers and communities have a seat at the table when determining appropriate just transition measures such as relocation, training, and safety nets like early retirement.

+ Ensure that new jobs are quality, particularly in emerging green industries: As new industries and markets emerge, it is important to ensure that the policy and regulatory context supports decent worker pay, conditions and benefits.
CASE STUDY

RENEWABLES SECTOR JUST TRANSITION ROADMAP TO TARGET COAL AND GOLD REGIONS IN SOUTH AFRICA

South Africa’s renewable energy industry is preparing a detailed just transition roadmap that will incorporate employment, spatial and industrialisation components to the deployment of solar and wind in a bid to catalyse economic activity and job creation in areas where coal and gold mining are in terminal decline. The plan will seek to direct independent power producers to develop projects in areas where the coal industry will be affected by the decommissioning of several power stations over the coming two decades, as well as in the gold mining towns where production has been waning for decades.

The sites chosen for designation as Renewable Energy Development Zones have been selected in consultation with solar and wind developers, and renewable energy projects in them have been fast tracked for environmental approval, given these areas have previously undergone environmental impact assessments.

The aim is to maximise employment and industrialisation spin-offs that come from onshore wind and solar PV as part of the country’s transition, with strong growth in both technologies expected given low costs. The South African government is also thinking through other socio-economic aspects of the transition:

for example, by ensuring that former coal miners receive preference for employment in new renewables projects and by creating domestic manufacturing expertise to supply renewables plants.

South Africa is finding that a detailed plan that focuses on building new business and employment opportunities is key to shifting the perception that the energy transition is a threat, and building understanding that there is no contradiction between economic growth and solutions that address climate change.


ALSO SEE:

Just transition: A report for the OECD (Smith 2017), which includes several just transition case studies.
**APPROACH**

1. Review any existing work that may have been completed, such as:
   + outputs from Part 2, Activity 5 (Consider long-term risks and opportunities) that identify sectors, industries and regions that face transition risk
   + skills gap analysis in the workforce for relevant sectors, for example taken from Part 3, Activity 1 (Understand barriers to deployment of low carbon technologies at scale)
   + International Labour Organisation (ILO) green jobs assessment reports
   + training curriculum for green jobs, with competency standards
   + subnational infrastructure gap analysis such as in energy, transport, and IT
   + impact assessments and cost-benefit analysis of policies
   + case studies of transition measures from other countries.

2. Draw on the outputs of Part 2, Activity 5 to inform a more detailed analysis of positive and negative impacts of the transition for key affected economic sectors, industries and regions.

3. Consult extensively with affected stakeholder groups to build consensus for the transition goals and pathways.

4. Identify priority areas for just transition intervention considering the creation of jobs, the impact on existing employment, social protections, impact to education or training (taking account of regional disparities in education and skills), and gender issues (ILO 2015).

5. The private sector (both investors and asset owners) should also be encouraged to plan for the transition, by developing a transition strategy, engaging with other corporations or investors exposed to the transition, allocating needed capital, supporting workforce transition, advocating for transition policy support, and sharing best-practices of just transition measures (Robins, Brunsting & Wood 2018).

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**THIS ACTIVITY SHOULD PRODUCE A JUST TRANSITION PLAN, WHICH COULD INCLUDE:**

+ impact assessment on specific sectors or industries that will undergo transition
+ financial or policy support measures for affected stakeholder groups
+ training needs assessment, to identify skill gaps, number of affected/targeted employees and reskilling opportunities
+ if possible, agreements with unions or business associations to strengthen commitments to transition.
TOOLS & RESOURCES

+ Guidelines for a just transition towards environmentally sustainable economies and societies for all International Labor Organisation (ILO) 2015.
  Provides non-binding practical guidance to governments and non-governmental organisations on how to formulate, implement and monitor the transition policy framework, in accordance with national circumstances and priorities.

  Outlines key concepts and principles for just transitions, developed in the context of OECD’s work program on growth, investment and the low carbon transition.

+ Developing and implementing just transition policies
  Conway n.d.
  A contribution to World Resources Institute’s expert perspectives series that outlines the elements and policy actions included in just transition approaches and principles to enhance subnational, national and international coordination.

+ Climate change and the just transition: A guide for investor action
  Grantham Research Institute 2018.
  Outlines five strategic motivations for investors to make the just transition part of their core operating practices.

+ Green jobs assessment reports
  ILO 2018.
  Provides a list of reports on green jobs assessment that analyses the employment impact of green policies, thus helping policymakers to make informed decisions based on state-of-the-art empirical methods and evidence-based research.

+ Coal transitions in Australia
  Institute for Sustainable Development and International Relations (IDDRI) 2018.
  Case study that discusses how Australia, a major coal-consuming economy, can transition away from coal in two modelled scenarios. It includes a case study of the closure of the Hazelwood power plant, including an assessment of stakeholder impacts such as employment and policy responses.

+ Development impact assessment tools
  Enhancing Capacity for Low Emissions Development Strategies (EC-LEDS) n.d.
  Supports the evaluation and communication of links between low-emissions development actions and a country’s social, economic, and environmental development goals, such as improved public health, job creation and energy access.
ACTIVITY 1:
Develop investment plan and project pipeline 114
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ACTIVITY 2:
Direct public finance towards priority investments and reflect in budgeting frameworks 121
Tools and resources 126

ACTIVITY 3:
Define the role for development finance institutions in scaling up blended finance 127
Tools and resources 130

ACTIVITY 4:
Explore the potential for ‘green banks’ and national development banks to catalyse private investment. 131
Tools and resources 136
Part 5 is the culmination of efforts undertaken across the other parts. It focuses on answering the key question for investment decision-makers – where, specifically, should financial resources be directed now and in coming years to drive transformational change, and how can governments catalyse the unlocking of private and development finance towards this goal?

The final part draws on the analysis done in the previous parts to map out where and how to most effectively deploy public, development and private finance over the coming decade. Part 2, Activity 2 (Estimate investment need over time) presents a generic assessment of long-term investment needs. Part 5 builds on this by creating a granular vision of the projects and programs to be prioritised for financing over the coming decade and identifying the preferred funding source.

By taking a more comprehensive approach to this planning, governments can more effectively leverage their own resources and steer financing from development finance institutions and overseas development assistance (for lower-income countries) to ensure private capital is unlocked at the scale and pace needed for the transition.
BEST PRACTICE

Ideally, governments would also consider adaptation investment needs in a holistic investment planning approach. Governments may find challenges in financing for adaptation, which will usually come from public budgets or public funding. There remains, however, a need to strengthen adaptation investment approaches, such as those identified in the Adaptation Finance Accountability Initiative led by World Resources Institute (WRI) and the Assessing Climate Change Adaptation Framework (ACCAF). There are efforts to increase adaptation financing through debt market instruments such as green bonds, although the challenge lies in setting definitions and standards for climate resilience. One example of an effort to address that challenge is the Adaptation and Resilience Expert Group (AREG), initiated by the Climate Bonds Initiative (CBI).
PART 5, ACTIVITY 1

Develop investment plan and project pipeline.

OVERVIEW

‘While investing in new and improved infrastructure is an important part of getting growth going now, investing in the right kind of infrastructure will deliver growth that can last. To manage climate risks and deliver long-term sustainable growth, infrastructure investment needs to be low-emission, energy-efficient and climate-resilient.’

(OECD 2017, p. 19)

While long-term strategies and sectoral decarbonisation pathways are vital first steps for the low carbon transition, developing countries must also be able to transform these plans into bankable, low-emission infrastructure projects.

In Parts 2, 3 and 4, governments prioritised sectors, technologies, risks, and policy reform to set clear signals for investment. The objective of this activity is to further refine that prioritisation, to identify investment priorities for the coming decade, identify a pipeline of projects that are consistent with those investment priorities, and embed these into existing national investment planning approaches (such as national infrastructure plans, development plans and Public Investment Programs), thus ensuring that short-term investment action is consistent with long-term decarbonisation goals.

National (or, as some countries may prefer, sectoral) investment plans provide a blueprint showing where a government’s infrastructure and investment priorities lie, improving visibility, and sending clear market signals for investment. It is therefore critical that these align with long-term climate and development objectives.

In addition to meeting immediate infrastructure needs, national investment plans should consider how to prepare for the investment needs of tomorrow by including priority areas for R&D, early stage commercialisation and market development. These could draw on the opportunities analysis conducted as part of Part 2, Activity 5 (Consider long-term risks and opportunities) to ensure finance is available to scale up new technologies and sectors where a comparative advantage has been identified.

National investment plans should also define the role of government and non-state actors, such as development finance institutions and institutional investors (both state-owned and private) in addressing that investment need. Figure 9 describes the role key actors can play to catalyse investment across the stages of technology and market maturity, and the most suitable types of financial instruments. By considering early stage investments as part of the national investment plan, governments can stimulate investment to ensure readiness of technologies and markets when they are required to support the transition.
National investment plans should include clear investment objectives and target indicators that are specific, measurable, achievable, relevant and timely (McCarthy et al. 2012). This provides evaluation metrics against which line ministries and project proponents can assess the alignment of sectoral infrastructure planning (such as electricity and transport master plans) and the suitability of planned or proposed projects. Given the longevity of most infrastructure, resilience to the impacts of climate change should also be factored into the evaluation.

In the short to medium term, national investment plans also help to:

+ channel domestic public finance through government budgeting (Part 5, Activity 2);
+ coordinate budget support from development partners (Part 5, Activity 2);
+ provide clear guidance for development finance institutions on where to direct their investments (through blended finance) to support achievement of national development and climate objectives (Part 5, Activity 3); and
+ define a role for ‘green banks’ and national development banks in boosting the confidence of private sector investors to unlock capital at scale (Part 5, Activity 4).

Public investment programs are often rolling programs, updated regularly to reflect current circumstances and priorities but this may not be the case for other national and sectoral investment planning processes. Where planning cycles do not align with the timing for the investment prioritisation work undertaken in this activity, these plans should, as a first step, be evaluated for consistency with long-term climate objectives.
Any planned or proposed investments inconsistent with these long-term goals should be reassessed to minimise the risk of asset stranding.

Embedding climate-related investments into national investment planning can also help central government agencies such as the ministry of finance and ministry of planning to better coordinate international development and to enhance their effectiveness in fostering development and climate objectives. Development partners may provide support for the development of investment plans that identify financing options for climate change adaptation, mitigation and cross-cutting projects, programs and policy change to achieve national climate policy goals. Support can identify the key components and indicators required for bankable project formulation and support for capacity building (Chebly, Mancini & Zadek 2018).

Aligning today’s infrastructure needs and investment planning with long-term climate goals is challenging. There are several mechanisms and tools to help the government in this activity. Influencers – such as the OECD Centre on Green Finance and Investment, the New Climate Economy and the Global Infrastructure Investor Association – provide research and leadership to align infrastructure investment plans with sustainability targets. Mobilisers – such as the Global Infrastructure Hub – assist governments in developing bankable projects and investors in funnelling funds into those projects. Tool providers – such as the IRENA Navigator and the World Bank’s REFINe – aim to integrate environmental and social components of infrastructure projects into investment decisions.

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**BEST PRACTICE**

Where feasible, consider adaptation and resilience in pipeline development and investment planning, both by considering resilience to future expected climate impacts in infrastructure planning and by including adaptation-related infrastructure projects in the overall pipeline and investment plan.
**CASE STUDY**

**BANGLADESH COUNTRY INVESTMENT PLAN FOR ENVIRONMENT, FORESTRY AND CLIMATE CHANGE 2016-2021**

The Bangladesh Country Investment Plan for Environment, Forestry and Climate Change (EFCC CIP) is a strategic tool that translates policies into investment programs linked to measurable results. It provides a five-year (2016–2021) framework for national and international investments to address environmental, forestry and climate change issues in Bangladesh and to coordinate implementation among all stakeholders. The EFCC CIP identifies priority areas for investment and estimates the financing to be provided by the government of Bangladesh and its development partners. It describes the expected results along with clear indicators, including baseline and final target indicators, against which the effectiveness of the investment plan can be assessed. It also details which ministries are responsible for the programs and subprograms defined for each investment.

**TABLE 8. A RANGE OF POLICY INTERVENTIONS CAN FACILITATE THE SCALE AND PACE OF CLIMATE RESILIENT, LOW CARBON INVESTMENT**

<table>
<thead>
<tr>
<th>PROGRAM TITLE</th>
<th>CIP TOTAL</th>
<th>FINANCING IN US$ MILLION</th>
<th>GAP (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PILLAR 1: SUSTAINABLE DEVELOPMENT AND MANAGEMENT OF NATURAL RESOURCES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1 Sustainable forest management and enhanced socio-economic benefits from forests</td>
<td>885.0</td>
<td>54.2</td>
<td>830.8</td>
</tr>
<tr>
<td>1.2 Biodiversity conservation</td>
<td>538.5</td>
<td>44.9</td>
<td>493.6</td>
</tr>
<tr>
<td>1.3 Sustainable management of wetlands, rivers and marine ecosystems</td>
<td>693.1</td>
<td>490.5</td>
<td>202.6</td>
</tr>
<tr>
<td>1.4 Soil and groundwater management</td>
<td>343.5</td>
<td>52.8</td>
<td>290.7</td>
</tr>
<tr>
<td><strong>TOTAL (PILLAR 1)</strong></td>
<td><strong>2460.1</strong></td>
<td><strong>642.3</strong></td>
<td><strong>1817.8</strong></td>
</tr>
<tr>
<td><strong>PILLAR 2: ENVIRONMENTAL POLLUTION REDUCTION AND CONTROL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 Reduced industrial pollution</td>
<td>651.6</td>
<td>65.0</td>
<td>586.6</td>
</tr>
<tr>
<td>2.2 Reduced municipal and household pollution</td>
<td>2869.2</td>
<td>1040.5</td>
<td>1828.7</td>
</tr>
<tr>
<td>2.3 Reduced pollution from agriculture and other sources</td>
<td>198.6</td>
<td>3.3</td>
<td>195.3</td>
</tr>
<tr>
<td><strong>TOTAL (PILLAR 2)</strong></td>
<td><strong>3719.4</strong></td>
<td><strong>1108.8</strong></td>
<td><strong>2610.6</strong></td>
</tr>
<tr>
<td><strong>PILLAR 3: ADAPTATION AND RESILIENCE TO, AND MITIGATION OF, CLIMATE CHANGE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1 Disaster risk reduction</td>
<td>1654.7</td>
<td>724.1</td>
<td>930.6</td>
</tr>
<tr>
<td>3.2 Sustainable infrastructure development</td>
<td>2202.4</td>
<td>1705.5</td>
<td>496.9</td>
</tr>
<tr>
<td>3.3 Mitigation and low carbon development</td>
<td>783.3</td>
<td>455.6</td>
<td>327.7</td>
</tr>
<tr>
<td>3.4 Increased resilience at the community level</td>
<td>251.6</td>
<td>36.2</td>
<td>215.4</td>
</tr>
<tr>
<td><strong>TOTAL (PILLAR 3)</strong></td>
<td><strong>4892.0</strong></td>
<td><strong>2921.4</strong></td>
<td><strong>1970.6</strong></td>
</tr>
<tr>
<td><strong>PILLAR 4: ENVIRONMENTAL GOVERNANCE, GENDER, AND HUMAN AND INSTITUTIONAL CAPACITY DEVELOPMENT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1 Improved legislative, regulatory and policy framework</td>
<td>82.5</td>
<td>6.5</td>
<td>76.0</td>
</tr>
<tr>
<td>4.2 Improved stakeholder participation and gender equity</td>
<td>416.5</td>
<td>4.3</td>
<td>412.2</td>
</tr>
<tr>
<td>4.3 Improved organisational capacity and processes for evidence-based decision-making</td>
<td>109.0</td>
<td>29.6</td>
<td>79.4</td>
</tr>
<tr>
<td><strong>TOTAL (PILLAR 4)</strong></td>
<td><strong>608.0</strong></td>
<td><strong>40.4</strong></td>
<td><strong>567.6</strong></td>
</tr>
<tr>
<td><strong>TOTAL COST OF EFCC CIP</strong></td>
<td><strong>11679.5</strong></td>
<td><strong>4713.0</strong></td>
<td><strong>6966.5</strong></td>
</tr>
</tbody>
</table>

Source: Government of the People’s Republic of Bangladesh 2016
This activity is best led by key agencies such as the ministry of finance, ministry of planning and the financial service authority, in collaboration with relevant sectoral ministries (energy, transport, housing etc).

1. Review any existing work that may have been completed, such as:
   - outputs of Part 2, Activity 2 (Estimate investment need over time)
   - outputs of Part 2, Activity 6 (Prioritise actions)
   - outputs of Part 3, Activity 1 (Understand barriers to deployment of low carbon technologies at scale)
   - emissions baseline study for specific projects or technologies in the country
   - quantitative financing needs assessments as disaggregated as possible, such as at project level.

2. Draw on the analyses from Part 2, Activity 2 and Part 2, Activity 6 to identify priorities for inclusion in the national (or sectoral) investment plan, and a high level estimate of investment need.

3. Draw on the mapping of existing finance flows (Part 1, Activity 4) to identify gaps between existing finance flows and indicative investment needs.

4. Draw on the Technology Readiness Level and Commercial Readiness Index analysis completed as part of Part 3, Activity 1 to evaluate investment plan priorities against technology and commercial readiness, and to identify the types of financial instruments needed and the role of government, development finance institutions, institutional investors (both state-owned and private) according to the stage of readiness (see Figure 9, p.115).

5. Assess existing sectoral infrastructure plans against investment priorities to:
   - identify any potential misaligned investments, which should then be re-evaluated
   - identify planned and potential projects that align with the national investment plan priorities.

6. Build a pipeline of planned and potential projects (either at national or sectoral level) that best align with long-term climate, development and infrastructure objectives.
   - Look for projects that can be catalytic in sectoral transformation. For example, upgrading transmissions and distribution infrastructure may be key to unlocking investment in renewable energy.
   - The pipeline should be clear on the stage of project maturity: for example, project investigation, project feasibility, procurement, appointment of project proponent, financial close, construction complete/operations phase. This will help with allocating resources – government budgets, financing, international support – where they are most needed, lowering costs and increasing the effectiveness of financing.

7. Develop a more granular analysis of project investment needs.

8. Prioritise projects using a prioritisation approach such as SWOT Analysis, multi-voting technique, MCA4Climate project prioritisation tool, PEST analysis, OECD-DAC criteria, criteria-based matrix or other qualitative assessment tools (GCF 2016).

9. Define performance and outcome indicators for these projects and establish a process to track progress of implementation.
   - Draw on data from sectoral decarbonisation pathways (Part 2, Activity 1) to create baseline indicators across priority sectors and infrastructure.

10. Ensure investment priorities are embedded in sectoral plans and budgets of relevant ministries or government agencies: for example, power development plans, transport master plan or other sector infrastructure plans. This may need to be built into the next planning cycle.

11. Identify needs for capacity building and technical assistance, and update technical
assistance needs assessment as required (Part 1, Activity 5).

12. Review and adjust policy packages (Part 4) to be consistent with the investment plan.

13. Make the investment plan and project pipeline publicly available to signal to investors and project proponents where investment will be directed.

THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:

+ National and/or sectoral infrastructure investment plans that embed long-term climate objectives and that could be reflected in the government’s medium-term development plan.
+ Pipeline of climate-compatible projects.
+ Planned investments to be included in government budget (Part 5, Activity 2).
+ Planned investments to be supported by official development assistance (Part 5, Activity 2).
+ Performance and outcome indicators.

AREAS FOR FURTHER WORK

There is currently a gap in the guidance available for governments in developing countries as to how to evaluate the cost-effectiveness of building long-term resilience into infrastructure investments, particularly in the electricity and transport sectors.
TOOLS & RESOURCES

- **Developing robust project pipelines for low carbon Infrastructure**
  OECD 2018.

  Chapter 3 explores approaches taken by governments and public institutions to build robust project pipelines and align infrastructure investment to long-term climate objectives.

- **NDC invest**
  Inter-American Development Bank (IADB) n.d.

  A platform which offers financial solutions and technical support to build national goals and transform them into attainable plans that generate prosperous, resilient and neutral carbon economies by 2050.

- **RETScreen**
  Natural Resources Canada n.d.

  RETScreen is a clean energy management software system for energy efficiency, renewable energy and cogeneration project feasibility analysis, as well as ongoing energy performance analysis. RETScreen empowers professionals and decision-makers to rapidly identify, assess and optimise the technical and financial viability of potential clean energy projects.

- **GCF readiness tools and resources**
  Green Climate Fund n.d.

  The Green Climate Fund shares a range of tools and resources applied by countries to the identification, prioritisation and financing of their climate projects.

- **Climate change project prioritisation tool and Guidelines**
  Green Climate Fund, 2016.

  Describes and assesses a range of approaches for project prioritisation.

- **Global infrastructure project pipeline**
  G20 n.d.

  A free-to-use digital platform that allows governments to promote public infrastructure projects to a global investor network.

- **Center for green finance and investment**
  OECD.

  A platform for knowledge exchange in green finance among leaders from the private sector, government and regulatory institutions, academic and civil society.

- **Global infrastructure investor association**
  A network that provides advisory and stakeholder engagement to infrastructure investors interested in sustainable infrastructure projects.
PART 5, ACTIVITY 2

Direct public finance towards priority investments and reflect in budgeting frameworks.

OVERVIEW

This activity is intended to help governments to focus the use and allocation of domestic public finance to support non-marketable sectors or technologies important in reducing emissions.

The focus for public investment should be on fostering the enabling environment for other investors such as through:

1. **Market creation**: Government has a significant role to play in creating new markets for low carbon technologies: for example, by updating government procurement guidelines to prioritise low carbon technologies and energy sources.

2. **R&D**: Government can actively initiate pilot programs, develop and implement appropriate policies and programs to attract private sector investment for new technologies and design and implement incentive mechanisms, which will move the risk burden to the government budget.

3. **Risk sharing**: Government can participate as a shareholder in new technology or projects, provide guarantees to reduce political and/or institutional risks, and guarantee offtakes of products (for example, feed-in tariffs for renewable energy).

4. **Grants**: Governments can provide grants for project readiness, capacity building and affirmative actions.

The role of local governments in directing public finance is also important. National governments can optimise the role of regional fiscal transfers (or central-to-regional transfers) to encourage or align local government investment with national climate targets. This can be done, for example, by earmarking certain transfers for climate-related investment or expenditure or by creating performance-based fiscal transfers. An example of ecological fiscal transfers based on retention or expansion of forest cover can be seen in Indonesia (Surya Putra et al. 2019).

As well as using expenditure, governments can also optimise revenue instruments such as taxes and levies to direct proceeds towards more sustainable investments. For example, revenues from a carbon tax can be invested in green infrastructure or returned to the producer and consumer in the form of a tax cuts or tax dividends (tax swap or ‘revenue recycling’). Revenue instruments can also act to discourage unsustainable behaviours such as by a carbon tax on fuel to reduce fuel consumption or a land tax/permit to discourage deforestation (Sutiyono and Mafira 2015).

Developing countries often experience challenges in attracting private capital. While this activity alone cannot solve this problem, demonstrating government commitment through its own expenditure can help make the investment climate more attractive. Domestic public finance is still the main source of financing for regulatory and policy reform to enhance the investment climate and attract foreign direct investment – a key source of green finance.

Finally, governments will continue to play an important role in areas that struggle to attract...
investment: for example, in addressing social risk, building community consensus, delivering public communication, integrating vulnerable groups, supporting research and development and the achievement of adaptation measures.

Adaptation will continue to rely on government support, particularly in sectors such as agriculture, forestry and fisheries that rely greatly on government spending.

BEST PRACTICE
Governments could consider opportunities for repurposing current fossil fuel based investments to minimise their exposure to potential stranded assets.
CASE STUDY

INDONESIA’S FIRST MITIGATION FISCAL FRAMEWORK

In 2011, the government of Indonesia issued The National Action Plan to Reduce Greenhouse Gas Emissions (RAN GRK), which committed IDR 16 trillion (US$1.7 billion) in the budget in 2012. Maintaining budget commitment at this level until 2020 would, however, only deliver about 16% of the funding required to achieve the greenhouse gas (GHG) emissions reduction target. The Mitigation Fiscal Framework was prepared by the Ministry of Finance to assess the public expenditure and other policies needed.

The 2009 Medium Term Development Plan (RPJM) included explicit consideration of climate change mitigation, with strong emphasis on renewable energy and reforestation. A Medium Term Expenditure Framework was introduced to ensure that budget allocations reflected changing policies, such as the RAN GRK.

The Mitigation Fiscal Framework provided annual cost estimates of between US$11 and US$15 billion to achieve Indonesia’s National Action Plan to Reduce Greenhouse Gas Emissions target. The Mitigation Fiscal Framework identified that reliance on government budget support alone would only achieve 16% of the target while creating an additional budget deficit of 0.25% of GDP, which highlights the importance of the private sector in sharing the cost.

The Mitigation Fiscal Framework opened up a critical process in Indonesia by mainstreaming climate, its committed targets and investment needs into the country’s budgeting process. It started the process of Indonesia’s Climate Budget Tagging Program (currently operated by the Ministry of Finance), and the Climate Finance Landscape analysis (jointly overseen by the Ministry of Finance and the Financial Service Authority).

Source: Ministry of Finance 2012
CASE STUDY

CLIMATE BUDGET TAGGING

Climate Budget Tagging (CBT) is a tool for monitoring and tracking climate-related expenditures in the national budget system. It provides a database on climate change relevant spending, enabling governments to make informed decisions and prioritise climate investments. Climate Budget Tagging also encourages planning officers and policy managers to incorporate climate considerations in project design. By generating data on climate change investments (which the traditional budget classification would not), Climate Budget Tagging enables public scrutiny on government and donor spending on climate change issues, and strengthens accountability and transparency.

Climate Budget Tagging is not a stand-alone initiative and has to be aligned with the country’s fiscal framework. Climate Budget Tagging should:

+ be considered and implemented in the context of a climate change financing framework.
+ support the implementation of other public financial management reforms such as performance-based budgeting and medium-term expenditure frameworks.
+ be part of wider efforts contributing to a country’s readiness for climate finance such as that offered by the Green Climate Fund.

In embracing Climate Budget Tagging, countries also embark on works to enhance enabling conditions and readiness. Climate Budget Tagging thus provides coherence with other initiatives:

+ Joint leadership between finance, planning and environment: Generate buy-in and leadership from finance and planning ministries with technical support from environment ministry.
+ National climate change policy priorities: Climate Budget Tagging should be based on definitions, typology and criteria driven by national climate policy priorities in order to track climate spending towards these policy priorities.
+ Capacity building: Clear tools and guidance to line ministries and relevant agencies are essential for Climate Budget Tagging implementation. Also, training on climate tagging should be considered in the context of broader capacity building efforts, from raising awareness on climate change to integrating climate change into the budget process.

Some countries in Asia have implemented Climate Budget Tagging:

+ The Philippines: The Philippines mandated Climate Budget Tagging in national budget submissions for all government entities in 2015.
+ Indonesia: Since 2014, Indonesia has introduced a Low Emission Budget Tagging and Scoring System in key ministries to track resources spent to achieve the national emissions reduction target of 26% by 2020.
+ Nepal: Nepal was one of the first countries to adopt Climate Budget Tagging, incorporating a climate tag into its budgeting system in 2012.
+ Bangladesh: The government of Bangladesh adopted a Climate Fiscal Framework in 2014 that proposes a climate expenditure tracking framework be applied to all line ministries’ budget submissions. It also tags on-budget overseas development assistance.

Source: Haselip et al. 2015

Also see:

+ Bangladesh experience in establishing Climate Fiscal Framework
+ Kenya’s experience in improving subnational government investments in climate change mitigation and adaptation
**PART 5, ACTIVITY 2**

**APPROACH**

1. Review any existing work that may have been completed, such as:
   + Disaggregated national data sets such as national budget data including international grants, government budget allocations, domestic climate finance analysis (from Part 1, Activity 4).
   + Cross-ministry annual and five-year work program documents.
   + Analysis of effectiveness and efficiency of government expenditure and financing for climate programs.
   + Finance needs assessments relevant to government expenditure.
   + Tracking of adaptation finance.

2. Compare existing climate finance flows (Part 1, Activity 4) with the estimated investment need from government budget identified in Part 5, Activity 1 to identify where additional budget allocations need to be found.

3. Modify existing programs by adding climate mainstreamed output indicators that can also enhance the ability to attract funding.

4. Allocate budget for new projects and programs through line ministries or provincial/subnational budget allocations, including policy packages developed in Part 4, Activity 1.

5. Ensure budget is allocated to operations and maintenance to ensure capital investments also deliver service enhancement. Proper maintenance can significantly reduce lifecycle costs for infrastructure (Rozenberg & Fay 2019).

6. Allocate budget to reform financial sector policies (see Part 4, Activity 2).

7. Define priorities for international support through country partnership strategies and conduct international finance support negotiations to agree on a portfolio that has mainstreamed priority climate actions. In defining priorities, it is important to ensure that development finance doesn’t ‘crowd out’ private investment.

8. Integrate budget support from development partners such as international donors, development banks, national and international think tanks into government budget records.
   + Development partner budget support can address different aspects such as readiness, risk allocation and different stages of the project investment.
   + By integrating their support into budgetary mechanisms, governments avoid redundancy and improve the quality of resource allocation.

9. Review fiscal policy, climate change financing framework and other budgeting frameworks to ensure that long-term climate objectives are prioritised.

10. Set up Climate Budget Tracking or other means to monitor climate-related expenditure within the budget.

11. If necessary, a state decree may be issued by the national government or regional government. In developing countries, policy ownership (especially those involving budget commitment) is key and often needs legal support through decrees at different levels.

**THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:**

+ Climate finance gap analysis for specific sectors or projects. For example, ecosystem restoration financing often receives insufficient budget allocation from a country’s budget. Knowing the actual cost of restoration and the gap in government budget support will help inform the private sector.

+ Selection of budgetary instruments. For example, expenditure, revenue or regional transfers, which can be utilised for identified climate actions, should also be mapped to specific ministries.

+ Selection of tools to guide monitoring of climate investments. The tools must include monitoring for different actors such as public and private, different sources such as domestic and international, and different uses across sectors.
Tools & Resources

- Financing climate futures
  ‘Chapter 4: Ensure fiscal sustainability for a low emission, resilient future’ outlines four priority policy actions to use the power and influence of public budgets to build momentum towards a low-emission, resilient economic future.

- Beyond fossil fuels: Fiscal transition in BRICS
  IISD 2019.
  Brings together official data on governments’ revenues and subsidies associated with fossil fuels in Brazil, Russia, India, China and South Africa (BRICS). It offers initial recommendations on aligning BRICS’s fiscal policies with a clean energy transition.

- National monitoring approaches for climate change public finance
  GIZ 2016.
  Describes an example of climate change budget tracking, summarises five tools that can support climate change financial monitoring and identifies key enabling conditions for its effective application.

- Climate change public expenditure and institutional review sourcebook
  World Bank 2014.
  Provides practitioners with the tools and information needed to respond to the public expenditure policy and management challenges arising from climate change.

- Climate public expenditure and institutional review: A methodological guidebook
  UNDP 2015.
  Seeks to equip relevant stakeholders (governments, donors, CPEIR practitioners) with information on a step-by-step process, methodologies and tools to conduct a CPEIR.

- Budgeting for climate change
  UNDP 2015.

- Knowing what you spend: A guide note for governments to track climate finance in their budgets
  UNDP 2019.
  Designed for government agencies responsible for climate finance within ministries of finance, ministries of planning or climate change policy-making bodies that wish to set up a Climate Budget Tagging system or strengthen an existing one, and that are exploring ways to improve their management of the response to climate change and to reduce long-term impacts on their nations.

- Tracking subnational government investments in climate change mitigation and adaptation in Kenya
  Development Initiatives 2019.
  This reviews the progress being made in climate change investment through budget allocations between 2016/17 and 2018/19 financial years by county governments in Kenya.
PART 5, ACTIVITY 3

Define the role for development finance institutions in scaling up blended finance.

OVERVIEW

Unfamiliarity with new technologies, markets or financial instruments can increase the risk profile of projects, making them unbankable. Development finance institutions (DFIs) play an important role in unlocking private capital by providing risk capital (typically in the form of higher risk loans, equity positions and risk guarantee instruments) for economic development projects in industrialising countries that would otherwise not be able to get funds from commercial lenders. As such, they help to enhance the bankability of projects for private sector investors.

For the purposes of this activity, development finance institutions are defined to include multilateral development banks, national development banks and bilateral development banks. They exclude smaller financial institutions that focus on microfinance and community-level development financing.

Development finance institutions can support clients with financing to help countries to reach and exceed their climate commitments – for instance, through innovative blended finance opportunities that pave the way and leverage private capital (Chebly, Mancini & Zadek 2018).

This activity aims to help governments determine how best to leverage development finance institution investment through blended finance by providing clarity or direction to development finance institutions on where to invest for greatest impact: for example, in technologies that are less mature and high-risk.

Blended finance is an approach to structuring investment that enables development finance institutions to achieve social impact objectives by reducing investment barriers to unlock private sector investment. It does this by addressing the main barriers for private investors, such as high perceived and real risk and poor returns relative to comparable investments (Convergence n.d.). See Table 14 in the Appendix for a range of blended finance instruments that can be used by development finance institutions.

This activity can assist in identifying which blended financing approaches (that is, de-risking instruments and credit enhancements) should be used to ensure private sector participation in priority infrastructure investments.

By taking an active coordination role, governments can also improve climate finance tracking, covering both public and private finance flows.
PART 5, ACTIVITY 3

APPROACH

This activity is best led by the ministry of finance in collaboration with the national development bank, state-owned enterprises responsible for infrastructure investment, the financial regulator, and other major development finance institutions operating in your country.

1. Review any existing work that may have been completed, such as:
   + outputs from Part 5, Activity 1 to identify finance gaps and priorities for development finance institution and private sector investment
   + case studies on various blended finance instruments
   + investment data in key sectors or low carbon technologies
   + outputs from Part 3, Activity 2 and Part 4, Activity 2 that review financial stakeholders, available instruments, and financial barriers
   + project feasibility studies.

The OECD and World Economic Forum (2015) have released a how-to guide for using blended finance, which has been adapted below.

2. Understand the starting point: working with line ministries, assess the status and effectiveness of blended finance already implemented in your country.

3. Build organisational buy-in and awareness: ensure strong understanding of, and support for, the use of blended finance by line ministries and sub-national governments, including its prioritisation to achieve development and climate objectives to create the necessary conditions for scaling up the blended finance.

4. Formulate a preliminary set of goals and principles: ensure blended finance is focused, measured and deployed selectively to ensure optimal use. The financial regulator can play a role making sure the use of blended finance is prudent and does not put financial institutions under stress. It is also important to ensure that blended finance is targeted where it is genuinely needed to unlock private capital, and so does not displace traditional investment structures.

5. Assess gaps in organisational capacity: to support government to gain a comprehensive understanding of its blended finance capabilities, determine the blended finance mechanisms that are best placed to scale in the short term, and identify key gaps in undertaking the selected blended finance instrument/approach. Findings should be built into the technical assistance program (Part 1, Activity 5).

6. Pilot a blended finance deal in a new investment project: choose a potential investment project from the project pipeline (Part 5, Activity 1) that provides the opportunity for piloting blended finance in a sector or technology where it has not previously been used. Work with development finance institutions to engage private investors and structure and execute a blended finance transaction (see list of blended financial instruments in Table 14 in the Appendix).

7. Review lessons learned to build blended finance capabilities: based on lessons learned from the pilot, review which institutional capabilities the government needs most. Decide how project prioritisation can be improved and what organisational structures are best suited to scaling up blended finance.

8. Develop pipeline and deal execution capacity: drawing on the project pipeline developed in Part 5, Activity 1, build a pipeline of projects suited to blended finance that meets the country’s impact objectives and builds partnerships with the private sector.

9. Learn and scale up: set up monitoring and evaluation to assess success and impact, inform the refinement of the blended finance strategy and portfolio, and catalyse financial innovations.
PART 5, ACTIVITY 3

THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:

+ A blended finance instrument planned or executed through a ministry or state or privately-owned financial institutions (executing agencies).
+ Capacity building or technical assistance program on the piloted or planned instrument targeted to finance managers and analysts at the executing agencies.
+ Demonstrated or piloted blended financing to green projects, with support from international public money or private money (domestic or international).
+ Monitoring and evaluation report on blended finance instruments.
+ Investment plan to scale up the blended finance size in identified sectors.
**TOOLS & RESOURCES**

- **GCF readiness program**
  Green Climate Fund.

  Provides financial resources to help nationally designated authorities and accredited direct access entities engage with the Green Climate Fund and enhance access to Green Climate Fund financing.

- **Green Climate Fund accreditation toolkit**

  Developed to support Uzbekistan to access finance from the Green Climate Fund, and to provide guidance on the Green Climate Fund process and accreditation that provides useful information for other countries.

- **Blended finance primer**
  Convergence n.d.

  Leverages Convergence’s database of historical blended finance transactions to generate unique insights about the blended finance market to date.

- **A Resource for structuring blended finance vehicles**
  Global Impact Investing Network.

  Provides a suite of resource documents for stakeholders who have decided to utilise a blended finance structure that leverages one of the following catalytic tools: junior equity, guarantee, subordinated debt, technical assistance, first-loss capital.

- **Aligning development co-operation and climate action: The only way forward**
  OECD 2019.

  Outlines a conceptual framework for development cooperation providers to design, implement and continually assess their efforts to align with Paris Agreement.

- **A how-to guide for blended finance**

  A practical guide for development finance institutions and philanthropic funders to integrate blended finance best-practices into their organisation, presented through examples and cases in user-friendly tables.
PART 5, ACTIVITY 4

Explore the potential for ‘green banks’ and national development banks to catalyse private investment.

OVERVIEW

A dedicated national climate finance facility can be catalytic in unlocking private finance at scale. This activity considers two approaches that have been used by national governments – the establishment of a dedicated climate finance facility within an existing national development bank or the establishment of a fit-for-purpose ‘green bank’. The choice is highly context-specific. This activity supports governments to consider each option and the process required for implementing its preferred choice.

In addition to their role in facilitating blended finance, national development banks (NDBs) are an important means of directing public finance, as they are often an integral part of government systems and their mandates and activities respond directly to policy signals.

National development banks have a development mandate to finance underserved sectors. They are also intended to complement, rather than compete with, private financiers. National development banks often act as a project structurer, providing technical assistance alongside financing. Most importantly, national development banks are risk takers, addressing risks and barriers where the private sector will not.

They play a critical role in unlocking climate finance, particularly in developing countries, as they can:

+ **PROVIDE FINANCE FOR GREENFIELD, LOW-EMISSIONS, RESILIENT INFRASTRUCTURE.**
  This helps to achieve proof-of-concept for specific technologies, investments and business models in new markets. Later in the project cycle, these can be refinanced by commercial investors.

+ **ENGAGE IN POLICY REFORM AND MARKET CREATION.**
  Development banks can support policy reform, removing specific barriers to investment, and create markets to scale up climate action. They also help to develop project pipelines and bring these to bankability through targeted project development support.

Many national development banks, however, lack a clear mandate to promote national climate change mitigation and may invest in renewable energy projects and fossil fuel projects in parallel. By contrast, green banks focus exclusively on low carbon investment and face fewer competing agendas. (OECD, 2015e).

The term ‘green bank’ is shorthand for financial institutions, funds or facilities dedicated to leveraging private-sector investment into low carbon and climate resilient solutions. Green banks are publicly capitalised. They are typically either public, quasi-public or non-profit, and have been set up at the national, subnational and even city level. Green investment banks play a similar role to development banks but are focused primarily on investing in climate infrastructure and technologies and can therefore be less constrained by the need to deliver both climate and developmental outcomes.

Green investment banks can play a role in establishing a history of risk return profiles to eventually mainstream low carbon investments in the finance sector. They use public funds to lower the cost of finance for new technologies and
infrastructure (generally considered higher risk) in the domestic market, facilitating proof of concept and commercial scaling.

While green investment banks may differ in scope and approaches, they generally share some core characteristics (OECD 2015b):

+ a narrow mandate focused primarily on mobilising private low carbon and resilient investment using interventions to mitigate risks and enable transactions
+ independent authority and a degree of latitude to design and implement interventions
+ a focus on cost-effectiveness and performance reporting.

Establishing a new institution can be costlier than ‘greening’ an existing institution and can entail some duplication. Establishing a green bank with autonomy from the government does, however, create flexibility to experiment, innovate and adapt to market developments in ways that may be difficult for a national development bank (OECD, in IADB & GFL 2019).

National development banks may also be constrained in the financial instruments they are able to offer. The OECD (2015e) found that, among members of the International Development Finance Club, 78% of financing in 2013 was in the form of concessional loans, followed by non-concessional loans (17%) and grants (3%), with other financial instruments such as equity and guarantees accounting for only 1% of investment.

By contrast, green investment banks are often more oriented toward accelerating risk-taking by investors, through demonstration, co-investment and sharing risks with investors using guarantees and other risk mitigants (OECD 2015b). They can offer a range of innovative financial instruments and structures, with a focus on addressing market barriers to allow rapid scaling up of low carbon, resilient infrastructure.
CASE STUDY

GREEN BANKS TO MOBILISE INVESTMENT IN EMERGING ECONOMIES AND DEVELOPING COUNTRIES

Internationally, there has been a movement towards green banks. To realise the Paris Agreement goals, new climate finance capacity is needed at the national and subnational level to develop local capital markets, activate local commercial banks and connect with local market intelligence. Nationally based institutions such as green banks are coming into focus as the vital link to channelling capital into country-led decarbonisation. Green banks build national financial capacity to address market barriers, helping to channel domestic savings and private investment into priority projects. Green banks also provide international financial institutions with a strong national cofinance partner (and lead arranger) with blended finance capabilities. For donor countries, green banks are an effective and efficient wholesale distribution partner for concessional green finance.

Green banks have been successful in a number of OECD jurisdictions. The Green Bank Network estimates its member banks have deployed US$11.3 billion in capital, which resulted in US$41.1 billion worth of projects financed and 25 million tonnes of CO₂ avoided. The figure is equivalent to taking 11.6 million cars off the road. On average, Green Bank Network members have leveraged more than US$2.60 in private capital for every dollar of public capital invested.

Recognising the applicability of the green bank model in emerging markets (in particular, to address market failures that inhibit private capital flows), over 30 developing countries in the Asia-Pacific, Latin America, and Africa are exploring green banks in various forms. Some are extensions or evolutions of existing national development banks, some are private institutions seeking to be first movers, and others are new green finance institutions.

Source: Green Bank Design 2020
APPRAOCH

1. Review any existing work that may have been completed, such as:
   - mapping of existing climate finance flows (Part 1, Activity 4) to identify key gaps that a green bank or fund could help to address
   - analysis of the set of instruments the national development bank is able to utilise to leverage climate finance including grants, tier-1 and tier-2 loans, equity, and guarantees.

2. Assess whether it is preferable to ‘green’ an existing national development bank or establish a green investment bank.

3. A focus on ‘greening’ the national development bank will need the following considerations (Smallridge et al. 2013):
   - Determine which role of the national development bank should be optimised in the planned investments.
   - Determine which instrument(s) the national development bank should use, for example:
     - Grants to finance pre-investment stage activities such as technical assistance, feasibility studies, business plans.
     - Tier-1, or direct, loans to extend credit from financial institutions to project developers. In this structure, national development banks carry some of the risks for the project developer and can blend the financing with grants or concessional loans. This instrument is useful to attract local or international financing for large projects.
     - Tier-2 loans to local financial institutions such as banks, often on concessional terms. In this case, the national development bank carries the credit risk of the local banks. This instrument is useful to finance projects that need a low interest rate or a long payback period.
     - Equity to provide anchor funds that will provide additional security and leverage to the project developer in attracting external financing. This instrument is useful to finance new technology projects.
     - Guarantees or liability contingent instrument to local financiers or project developers, in order to assume some of the credit risk which otherwise prevents private investment. This instrument is useful to support projects with high risk exposure.
   - Identify partners to be linked to the national development bank to support establishment of a green fund, such as multilateral development banks, development finance institutions or foreign export credit agencies.

4. A focus on establishing a green investment bank will need the following considerations (adapted from OECD 2015c):
   - Identify a suitable source to capitalise the bank: Countries have used a variety of sources such as appropriations, carbon pricing revenue, utility bill surcharges, loans, bond issuance and national government funding.
   - Decide the funding remit for the bank: There are a range of investment classes that banks can choose from including large- and mid-scale renewable energy technologies, transmission and distribution infrastructure, low carbon industrial technologies, water and waste management, natural resource conservation technologies, alternative fuels transport, energy efficiency (industrial, commercial and residential) and rooftop solar PV.
   - Determine which financial instruments the bank should use: For example, senior and subordinate loans, bond-based financing and equity.
   - Consider complementary financing mechanisms to enhance attractiveness to investors. For example:
     - Risk mitigants to reduce the risk profile of projects (loan loss reserves,
guarantees, insurance, debt subordination).

> **Transaction enablers** to increase the flow of capital by bundling small-scale projects to achieve scale and reduce transaction costs, such as:

v. *Warehousing* to aggregate small projects.

vi. *Securitisation*, in which non-traded or small-scale assets are transformed into a standardised, tradable asset.

vii. *Co-investing* alongside investors without sufficient scale or expertise.

viii. *On-bill financing* to allow borrowers to repay clean energy or energy efficiency loans through their utility bill.

ix. *Leasing* to enable customers to make use of assets such as rooftop solar PV without purchasing them.

----------

**THIS ACTIVITY SHOULD PRODUCE THE FOLLOWING OUTPUTS:**

+ An assessment of the most suitable public bank structure (national development bank green fund or green bank) to support the low carbon transition, including recommendations on:

  - Approach to capitalisation.
  - Required financing instruments to mobilise low carbon investment at scale.
  - Funding remit across investment classes.
TOOLS & RESOURCES

+ **Green Bank Network**
  Database of green investments and green projects made by members of Green Bank Network.

+ **Reports and white papers**
  Green Bank Network.
  Contains a list of reports and white papers on a range of topics, including how to mobilise private sector financing for sustainable infrastructure and other assets, and how to measure and report the impact of green investment banks.

+ **Financing climate futures**
  ‘Chapter 6: Rethink development finance for climate’ outlines the key changes that governments and development banks need to make to scale up climate-compatible development finance.

+ **Green investment banks: Policy perspective**
  OECD 2015.
  Provides policymakers with the first comprehensive study of publicly capitalised green investment banks, examining the rationales, mandates and financing activities of this relatively new category of public financial institution.

+ **Establishing a green bank or greening an existing bank?**
  IADB & GFL, 2019.
  This paper examines the relative merits of establishing a green bank compared to ‘greening’ an existing national development bank. It outlines a basic process to ‘green’ a national development bank, if that option is chosen.

+ **The role of NDBs in scaling up international climate finance**
  IADB 2013.

+ **Blending climate finance through national climate funds**
  UNDP 2011.
  Describes a process for establishing a national climate fund.
### Appendix

**TABLE 9: SUGGESTED INDICATORS FOR INCLUSION IN SECTORAL MODELLING. ALL SHOULD BE MEASURED AT TIME STEPS (FOR EXAMPLE 2030, 2040, 2050)**

<table>
<thead>
<tr>
<th>PROGRESS INDICATORS</th>
<th>INVESTMENT INDICATORS</th>
<th>RISK/OPPORTUNITY INDICATORS</th>
<th>‘READINESS’ INDICATORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Supply and demand (MWh)</td>
<td>+ MW of new generation and electricity storage capacity, by technology type</td>
<td>+ MW of coal or gas closed by time interval</td>
<td>The following modelling assumptions provide an indication of ‘readiness’:</td>
</tr>
<tr>
<td>+ Fuel mix</td>
<td>+ CapEx by technology type</td>
<td>+ Early asset retirement to meet emissions target.</td>
<td>+ Technology deployment / build-out rates</td>
</tr>
<tr>
<td>+ Share of renewable electricity (generation)</td>
<td>+ Transmission and distribution upgrades</td>
<td>+ MW of renewable energy including battery storage potential</td>
<td>+ Labour force skills limitations</td>
</tr>
<tr>
<td>+ Changes in total sector emissions</td>
<td></td>
<td>+ T&amp;D risks (intermittency, shift to distributed generation etc.)</td>
<td>+ Asset lifecycle /turnover rates</td>
</tr>
<tr>
<td>+ Emissions intensity (e.g. tCO2e/MWh, tCO2e/unit of GDP)</td>
<td></td>
<td>+ T&amp;D opportunities (smart grids, digitisation)</td>
<td>+ Technology costs</td>
</tr>
<tr>
<td>+ Generation costs by fuel type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Electricity price</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Share of electricity use in total energy use</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>+ Employment indicators</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>+ Changes in T&amp;D losses</td>
<td></td>
<td></td>
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<tr>
<td>+ Well-being indicators (e.g. air pollution, affordability, electricity access indicators, changes in natural resource consumption, job quality, changes in water use)</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**ELECTRICITY SECTOR**
<table>
<thead>
<tr>
<th>INDUSTRIAL SECTOR</th>
<th>PROGRESS INDICATORS</th>
<th>INVESTMENT INDICATORS</th>
<th>RISK/OPPORTUNITY INDICATORS</th>
<th>‘READINESS’ INDICATORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Changes in total sector emissions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Emissions/energy intensity by industry sector (e.g. tCO2e/unit of GDP, kWh/unit of GDP)</td>
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<td></td>
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<tr>
<td>+ Non energy emissions intensity</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>+ Employment indicators</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Share of electricity used in industry</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Changes in fuel mix</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Well-being indicators (e.g. Air pollution, changes in resource efficiency, job quality, changes in water use)</td>
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<tr>
<td>+ Rate of fuel switch (e.g. electrification)</td>
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<tr>
<td>+ CapEx by technology type.</td>
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<tr>
<td>+ Rate of materials substitution</td>
<td></td>
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<td></td>
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<tr>
<td>+ Changes in output by industry sector</td>
<td></td>
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<tr>
<td>+ Changes in value of key economic sectors (e.g. sector value add)</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>BUILT ENVIRONMENT</th>
<th>PROGRESS INDICATORS</th>
<th>INVESTMENT INDICATORS</th>
<th>RISK/OPPORTUNITY INDICATORS</th>
<th>‘READINESS’ INDICATORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Changes in total sector emissions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Emissions/energy intensity per building type (e.g. tCO2e/m2 kWh/m2)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>+ Share of electricity use in energy use per building type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Material recycling rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Changes in fuel mix</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>+ Well-being indicators (e.g. changes in housing costs as a proportion of household income)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>+ Changes in building stock turnover</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ CapEx by technology type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Building insulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Appliance efficiency</td>
<td></td>
<td></td>
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<tr>
<td>+ Changes in floorspace per building type.</td>
<td></td>
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<tr>
<td>+ Changes in construction material</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>PROGRESS INDICATORS</td>
<td>INVESTMENT INDICATORS</td>
<td>RISK/OPPORTUNITY INDICATORS</td>
<td>‘READINESS’ INDICATORS</td>
<td></td>
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<tr>
<td>---------------------</td>
<td>-----------------------</td>
<td>----------------------------</td>
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<td></td>
</tr>
<tr>
<td>TRANSPORT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Number of vehicles and by type (ICEs, hydrogen, EV, PHs)</td>
<td>+ % trips (or passenger kilometres) by transport type (private, public and active transport)</td>
<td>+ Modal shift</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Share of low carbon vehicles (proportion of new car sales and total fleet)</td>
<td>+ % electric vehicles in road fleet</td>
<td>+ Changes in fuel use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Changes in total sector emissions.</td>
<td>+ Fuel demand</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Emissions/energy intensity by transport type (private, public and active transport) (e.g. tCO2e/km, fuel consumption/km)</td>
<td>+ CapEx by technology type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Emissions intensity per unit of GDP</td>
<td></td>
<td></td>
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<tr>
<td>+ Well-being indicators (e.g. air pollution, rate of soft transport (e.g. walking, biking), transport access</td>
<td></td>
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</tr>
<tr>
<td>LAND USE AND FORESTRY</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>+ Land use mix.</td>
<td>+ Reforestation rates</td>
<td>+ Million ha carbon forestry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Changes in total sector emissions.</td>
<td>+ CapEx by land use type</td>
<td>+ BAU land conversion projections vs. abatement case</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Emissions intensity per land use type (e.g. tCO2e/ha)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Emissions intensity per unit of GDP</td>
<td></td>
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<tr>
<td>+ Share of degraded land.</td>
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<td></td>
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<tr>
<td>+ Employment indicators</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>+ Food security indicators (e.g. value added in agriculture, commodity price variability, FAO food security index)</td>
<td></td>
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</tr>
</tbody>
</table>
**FIGURE 10: ILLUSTRATIVE GRAPH HIGHLIGHTING SCALE OF TECHNOLOGY TRANSITION IN THE POWER SECTOR.**

Sectoral transformation pathways such as this are useful for communicating the scale and pace of transition required in a given sector.

**POWER GENERATION FOR 2020-2050, TWH**

**FIGURE 11: INDICATIVE GRAPH SHOWING TOTAL INVESTMENT IN CLEAN TECHNOLOGIES IN KEY SECTORS (BILLION US$).**

Graphs such as this provide a useful communication tool for communicating the scale of investment required across the economy over different time horizons, which is particularly useful for whole-of-government forward planning.

**INVESTMENT NEEDED IN KEY SECTORS, BILLION USD**

- **Buildings**: 68
- **Transport**: 133
- **Energy**: 2040-2050: 178

---

**FOSSIL FUELS**
- Diesel
- Gas
- Coal

**RENEWABLES**
- Tidal & wave
- Biofuels
- Geothermal
- Offshore wind
- Onshore wind
- Large-scale PV
- Rooftop PV

---

**POWER GENERATION FOR 2020-2050, TWH**

- 2020: 0
- 2030: 50
- 2040: 150
- 2050: 250
Sectoral investment graphs such as this provide a useful granular illustration of which specific technologies require investment, and at what scale, over different time horizons, which is useful for guiding sector-specific planning and financing.

By estimating the required financing in each sector over different time horizons, governments can understand the overall magnitude of finance required and better plan to ensure its deployment in each sector when required. This helps to guide the focus of Part 3 (Readiness assessment), which identifies where technology, market, finance and policy barriers need to be addressed to ensure finance can be directed where it is most urgently needed, and at the rate and scale required.
### TABLE 10: REFERENCE SCENARIOS THAT MAY PROVIDE A USEFUL BASELINE FOR DEVELOPMENT OF NATIONAL SCENARIOS  
(SOURCE: ADAPTED FROM IIGCC, N.D.)

<table>
<thead>
<tr>
<th>ORGANISATION</th>
<th>RELEVANT REPORTS / RESEARCH</th>
<th>LATEST REPORT</th>
<th>BRIEF DESCRIPTION</th>
<th>COVERAGE</th>
<th>TYPES OF RISKS ADDRESSED</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Energy Agency (IEA)</td>
<td>World Energy Outlook (WEO)</td>
<td>2019</td>
<td>+ Includes a Sustainable Development Scenario that fully aligns with the Paris Agreement goal of holding global temperature rise to well below 2°C and aiming for 1.5°C.</td>
<td>Energy sector</td>
<td>Transition</td>
</tr>
</tbody>
</table>
|                                            | Energy Technology Perspectives (ETP)    | 2017          | + It provides a policy perspective and its scenarios describe future pathways for the global energy system to 2040 under different assumptions.  
+ The ETP scenarios provide a technology perspective to identify economical ways to reach a desired outcome.  
+ Detailed information about IEA’s scenarios can be found in Appendix II of this report.  
+ NB: The IEA will publish the new ETP in June 2020.                                                                 |                                |                          |
| IPCC                                      | Special Report, Global Warming of 1.5°C | 2018          | + Explores four scenarios focused on stabilising global temperature rise at 1.5 °C including consideration of climate impacts and sustainable development outcomes.                                                                                                                                                                                                                                                                                                                                 | All sectors                     | Transition and physical risk |
| Bloomberg New Energy Finance (BNEF)       | New Energy Outlook (NEO)                | 2019          | + An annual long-term economic analysis of the world’s power sector up to 2050. The NEO focuses on technology that is driving change in markets and business models across the electricity sector.  
+ The report also includes forecasts for coal, oil and gas around the world, and assesses the impact of the energy transition on fossil fuel demand and materials.                                                                                                                                                                                                                                                                 | Electricity system              | Transition               |
| International Renewable Energy Agency (IRENA) | Global Energy Transformation: A Roadmap to 2050 (REmap) | 2019          | + REmap scenarios represent worldwide renewable energy potential. The analysis is based on a sector and technology bottom-up approach.  
+ The 2019 update report examines technology pathways and policy implications for a sustainable energy future.                                                                                                                                                                                                                                                                                                                                                          | Energy sector                   | Transition               |
FIGURE 13: ILLUSTRATIVE RISK HEAT MAP BY INVESTMENT AREA.

Heatmaps can be used to create a clear visual representation of risks and opportunities by economic sector over time and across different scenarios.

<table>
<thead>
<tr>
<th>INVESTMENT AREA</th>
<th>TRANSITION</th>
<th>PHYSICAL</th>
<th>LEGAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology - A</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Technology - B</td>
<td></td>
<td></td>
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<tr>
<td>Technology - C</td>
<td></td>
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<td></td>
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<tr>
<td>Technology - D</td>
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<tr>
<td>Technology - E</td>
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<tr>
<td>Technology - F</td>
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<tr>
<td>Technology - G</td>
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<tr>
<td>Technology - H</td>
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<tr>
<td>Technology - I</td>
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<td></td>
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<tr>
<td>Technology - J</td>
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<td></td>
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<tr>
<td>Technology - K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity Generation - A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity Generation - B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity Generation - C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity Generation - D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity Generation - E</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Electricity Generation - F</td>
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</tbody>
</table>
## TABLE 11: OVERVIEW OF ENABLING INFRASTRUCTURE FOR DECARBONISATION TECHNOLOGIES

<table>
<thead>
<tr>
<th>ENERGY</th>
<th>TRANSPORT</th>
<th>INDUSTRY</th>
<th>FOOD AND LAND USE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Decarbonisation technology / strategy</strong></td>
<td><strong>Related infrastructure</strong></td>
<td><strong>Decarbonisation technology / strategy</strong></td>
<td><strong>Related infrastructure</strong></td>
</tr>
<tr>
<td>Large-scale renewable energy generation (e.g. solar, wind, thermal, tidal)</td>
<td>Transmission and distribution (T&amp;D) infrastructure to connect generation to the grid</td>
<td>Electric and hydrogen passenger road vehicles and trucks</td>
<td>Vehicle charging and vehicle refuelling infrastructure</td>
</tr>
<tr>
<td></td>
<td>Large-scale energy storage (thermal cycle, power to gas, batteries)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small-scale distributed renewable energy resources (e.g. rooftop solar)</td>
<td>Microgrids, smart grids and virtual power plant infrastructure</td>
<td>Mass public passenger transport and active transport</td>
<td>Mass rapid electric transit systems (light rail, metro, bus lanes) Cycling and walking paths</td>
</tr>
<tr>
<td></td>
<td>T&amp;D infrastructure to connect generation to the grid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrification and energy efficiency improvements of end-uses</td>
<td>Retrofitting building stock and new zero energy or positive energy buildings</td>
<td>Aviation, shipping, rail and road freight biofuels</td>
<td>Airport, port, rail and road refuelling infrastructure</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Hydrogen as energy source</td>
<td>Hydrogen pipelines, stations and storage infrastructure</td>
<td>Autonomous ride-sharing vehicles</td>
<td>AV-compatible road infrastructure e.g. road sensors and street signs Intelligent transport systems</td>
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</tbody>
</table>
### Table 12: Barriers Analysis Framework (Source: ClimateWorks Australia 2018, Adapted from Haselip et al. 2015, P. 27)

<table>
<thead>
<tr>
<th>Categories of Barriers</th>
<th>Identified Barriers</th>
<th>Solutions to Address Barriers</th>
<th>Co-Benefits or Trade-Offs to Solutions</th>
<th>Degree of Effort Required</th>
<th>Who Holds Responsibility for This Action?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological Readiness</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Commercial Readiness</td>
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<td></td>
</tr>
<tr>
<td>Market &amp; Supply Chain Readiness</td>
<td></td>
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<td></td>
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<tr>
<td>Skills Transfer and Workforce</td>
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<tr>
<td>Legal &amp; Regulatory</td>
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<tr>
<td>Institutional Capacity</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Awareness &amp; Acceptance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 13: GOVERNMENTS, DEVELOPMENT FINANCE INSTITUTIONS AND THE PRIVATE SECTOR HAVE DIFFERENT ROLES TO PLAY IN ADDRESSING FINANCIAL BARRIERS (SOURCE: ADAPTED FROM OECD 2015A; WORLD ECONOMIC FORUM 2013)

<table>
<thead>
<tr>
<th>FINANCIAL BARRIERS</th>
<th>GOVERNMENT</th>
<th>CENTRAL BANKS, FINANCIAL SERVICE REGULATOR, NATIONAL DEVELOPMENT BANKS</th>
<th>DEVELOPMENT FINANCE INSTITUTIONS (DFIS)</th>
<th>PRIVATE SECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of financial products in key sectors</td>
<td>R&amp;D funding to establish a green finance regulatory framework</td>
<td>Set up or clarify regulations on green investment portfolio R&amp;D funding to establish a green finance regulatory framework</td>
<td>Research grant to explore blended finance and de-risking instruments</td>
<td>Enter public private partnership (PPP) scheme with public guarantee Work with DFI in piloting green investments, e.g. using green bonds Blended finance schemes</td>
</tr>
<tr>
<td>Lack of harmonised definitions and taxonomies</td>
<td>Central bank to issue taxonomy regulation</td>
<td>Help establish taxonomies based on international experience</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CONT.
<table>
<thead>
<tr>
<th>FINANCIAL BARRIERS</th>
<th>GOVERNMENT</th>
<th>CENTRAL BANKS, FINANCIAL SERVICE REGULATOR, NATIONAL DEVELOPMENT BANKS</th>
<th>DFIS</th>
<th>BILATERAL AND MULTILATERAL DEVELOPMENT BANKS</th>
<th>PRIVATE SECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited local capital markets</td>
<td>Provide junior debt financing to attract private investors</td>
<td>Green reserve requirements/collateral frameworks. Consider lowering capital requirements for green loans</td>
<td>Technical assistance/grants in development of specific financing instruments, e.g. sovereign green bonds</td>
<td>Financial instruments engineering, e.g. bundling small projects to increase the scalability</td>
<td>Provide mezzanine lending to strengthen project’s equity profile (e.g. Dong Energy in the UK)</td>
</tr>
<tr>
<td>Limited data on projects</td>
<td>Standardise data and reporting templates, provide funding guarantee, e.g. geothermal exploration funding.</td>
<td>Sustainable/green financing database – especially non-government financing – at project level disaggregation</td>
<td>Provide funding for technical support, research, feasibility study</td>
<td>Support development of green financing database</td>
<td>Provide accurate financial project data, as part of financial transparency commitment</td>
</tr>
</tbody>
</table>
### TABLE 14: A RANGE OF BLENDED FINANCE INSTRUMENTS CAN BE USED BY DEVELOPMENT FINANCE INSTITUTIONS
(SOURCE: OECD 2017, P. 288)

<table>
<thead>
<tr>
<th>INSTRUMENT/ APPROACH</th>
<th>HOW IT IS USED</th>
<th>EXAMPLE</th>
</tr>
</thead>
</table>
| Guarantee                  | Political risk guarantees can enable investment in higher risk countries. Credit guarantees can incentivise institutional investment. | The Multilateral Investment Guarantee Agency provided a guarantee against risks related to expropriation, war and civil disobedience to a Dutch solar company (SunE Solar) to cover investment in the development of three solar power plants in Honduras.  
The Multilateral Investment Guarantee Agency provided a guarantee to cover the non-honouring of financial obligations issued to back a US$361 million loan by Banco Santander S.A. of Spain to the state of Sao Paulo, Brazil, to improve the sustainability of Sao Paulo’s transport system. |
<p>| Currency Hedging           | Currency hedging mitigates the risk of currency fluctuations for foreign investors, important for infrastructure investment in developing countries. | The Currency Exchange Fund (TCX), supported by the German and Dutch governments, is a currency hedging fund. When the private fund manager ResponsAbility Investments provided local currency-indexed loans to M-Kopa, a Kenya-based solar home system company that provides decentralised solar solutions in Kenya, Tanzania and Uganda, it used a hedging contract with a specialist currency hedging provider, which either passes on the currency risks to commercial counterparties or to the Currency Exchange Fund, if the former does not exist. |
| Loan syndication           | Loan syndication mitigates business risks for private investors and builds on due diligence capacity of development banks. | Multilateral development banks usually take the role of lead arrangers, and the private sector steps in to provide additional capital. The division of the loan amount leads to risk diversification and it builds on the due diligence capabilities and reputation of the public sector arrangers. By doing this, the multilateral development banks boost investor confidence and reduce transaction costs. |
| Debt subordination         | Debt subordination diversifies risks and facilitates private investment.                        | The Green for Growth fund was launched by KfW Development Bank and the European Investment Bank (EIB) with the financial support of the European Commission, the German Federal Ministry for Economic Co-operation and Development (BMZ) and the EBRD. The fund invests in energy efficiency projects as well as projects increasing renewable energy sources in south-east Europe. The public donors are invested in the most junior tranche, while private institutional investors invest in the most senior tranches, thereby benefiting from the risk cushion provided by public donor investment. |</p>
<table>
<thead>
<tr>
<th>INSTRUMENT/APPROACH</th>
<th>HOW IT IS USED</th>
<th>EXAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-investment platforms and funds</td>
<td>Co-investment vehicles pool investor capital to deploy directly in infrastructure projects, bypassing intermediaries. Blended finance funds pool public and private capital to mobilise additional capital.</td>
<td>The Marguerite 2020 European Fund for Energy, Climate Change and Infrastructure brings together several national development banks and financing institutions, including Caisse des Dépôts et Consignations (CDC), Cassa Depositi e Prestiti (CDP), European Investment Bank (EIB), KfW and PKO Banco Polski to co-invest in renewable energy and sustainable transport infrastructure in Europe, with a focus on greenfield projects (minimum 65% of the fund) (Delia Croce and Sharma, 2014). Climate Investor One, launched by Netherlands Development Finance Company (FMO) and Phoenix InfraWorks and supported by funding from the government of the Netherlands, is a new fund designed to invest at the development, construction and refinancing stage of large-scale solar, wind and hydro projects, with initial project financed in Rwanda and Zambia.</td>
</tr>
<tr>
<td>Protect development facilities and technical assistance</td>
<td>Supports the development of bankable infrastructure projects.</td>
<td>The Asia Pacific Project Preparation Facility, funded by Australia, Canada and Japan, supports Asian Development Bank (ADB) member country governments and their public-sector agencies in preparing and structuring public-private partnership transactions for infrastructure, prioritising infrastructure with climate change and sustainable development elements. The Asian Development Bank will provide technical assistance.</td>
</tr>
</tbody>
</table>
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climate-targets-oil-production-and-fiscal-revenues-latin-america-and-caribbean


Executive Capacity/Interministerial Coordination/ Informal Coordination


UNFCCC LDC Expert Group 2015, Best Practices and Lessons Learned in Addressing Adaptation in the Least Developed Countries, United Nations Framework Convention on Climate Change,
UNFCCC Technology Executive Committee 2015, Good practices of Technology Needs Assessments, United Nations Framework Convention on Climate Change, Bonn Germany. https:// unfcc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEC_documents/5be1bf880cc34d52a4315206d54a711b/ed47c2dc2a84f5ba2831f268524903d.pdf


