

Coalition for Rainforest Nations



Developing a Low-Carbon Growth Plan

Volume 1 on climate-compatible development



Low-carbon growth for climate-compatible development

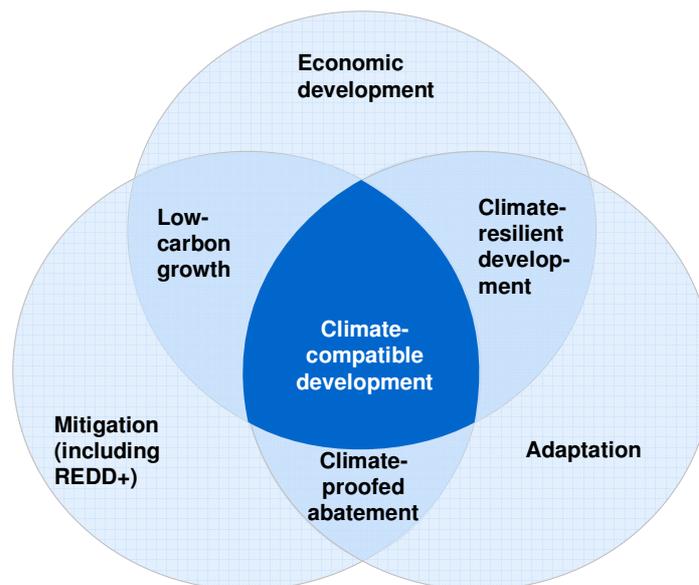
Political and business leaders worldwide realise the need for immediate and effective action to respond to climate change. This action may include policies to reduce greenhouse gas emissions, to curtail deforestation or to promote afforestation and other carbon sink policies. Most countries will also face enhanced risks from climate change and must adapt their societies to respond.

At the same time, leaders have an obligation to promote economic development and improve living standards for their constituencies. Achieving the country's and its peoples' development goals requires significant funds and binds a large share of government capacity. Climate change mitigation and adaptation compete for scarce resources and thus risk being de-prioritised if viewed as conflicting goals.

Countries must therefore find ways of combining their development, mitigation and adaptation goals to achieve climate-compatible development (Exhibit 1).

Exhibit 1

The components of climate-compatible development



- **Economic development** means expanding opportunities to increase incomes and create jobs, ultimately leading to a better life for a country's people. This process cannot be separated from the risks and opportunities presented by climate change. The resources provided by REDD+ or other mitigation action can be invested in more efficient and sustainable technologies (e.g., in power and transport). Economies of lower-income countries are also likely to be among the hardest hit by climate change and therefore need to be made climate-proof.
- **Climate change mitigation** means taking measures to reduce emissions of greenhouse gases at the lowest possible cost. Previous work by McKinsey on this topic concluded that there is enormous potential for abatement at relatively low cost in all sectors, including energy efficiency in transport, industry and buildings; low-carbon energy sources; more efficient land use and the use of carbon sinks.¹ For rainforest countries for example, schemes for promoting Reduced Emissions from Deforestation and Forest Degradation (REDD+) enable them to be rewarded for protecting their forest.
- **Adaptation to climate change.** Many countries are already vulnerable to climate events like floods, droughts, heat waves and tropical storms. Furthermore, gradual climate change can, for example, introduce malaria to new areas and cause irreversible damage to coral reefs. Climate change could significantly aggravate these climatic risks in the medium term, even if mitigation is pushed aggressively. Adaptation measures therefore need to complement mitigation action, to protect people and local economies from the negative effects of increasing climatic risks.

This white paper introduces the concept and methodology for a low-carbon growth plan, combining economic development with greenhouse gas mitigation. The focus here is on decarbonising development outside of the land use sectors. The paper *Developing a National REDD+ Strategy* details how to develop a plan to reduce emissions associated with land-use, land-use change and forestry (LULUCF). The paper *A National Strategy for Adaptation to Climate Change* describes a methodology to address climate risk in more detail, using a systematic approach to adaptation developed by the Economics of Climate Adaptation working group.

¹ McKinsey & Company (2009): *Pathways to a Low-Carbon Economy: Version 2 of the Global Greenhouse Gas Abatement Cost Curve*

The importance of a Low-Carbon Growth Plan



Economic development is an imperative for the over 1 billion people worldwide estimated to be living on less than EUR 1 a day. While the last 20 years have seen impressive rises in living standards in many countries, poverty, disease and lack of opportunity continue to constrain the lives of many. The food price rises of 2007-08 and global economic crisis of 2008-09 alone are estimated to have thrown over 200 million people back into poverty.¹

Mitigating and adapting to climate change is a priority for countries at all stages of development. Global greenhouse gas emissions can be reduced by more than 50 percent compared with a business-as-usual scenario until 2030, through a series of measures amounting to a cost of less than 1 percent of global GDP.² However, these actions require fundamental changes in all countries and sectors of the economy. This change must start now to avoid high switching costs later.

To be successful, action to tackle climate change must therefore be incorporated in a country's development and infrastructure investment strategy. Many of the assets required for development, particularly power supply, transport infrastructure and buildings, have high capital costs and long lives. Given that existing carbon-inefficient solutions often require less upfront investment than their low-carbon alternatives, there is a risk that developing countries today choose to invest into inefficient and ultimately less-sustainable alternatives, despite the availability and potential long-term social benefits of the climate-compatible alternatives. Furthermore, economic development often leads to land-use changes, which cause significant emissions, especially from deforestation. Sustainable development strategies do not forego growth, but employ low-carbon strategies to decarbonise economic activities.

¹ World Bank (2009): *Protecting progress: The challenge facing low-income countries in the global recession*

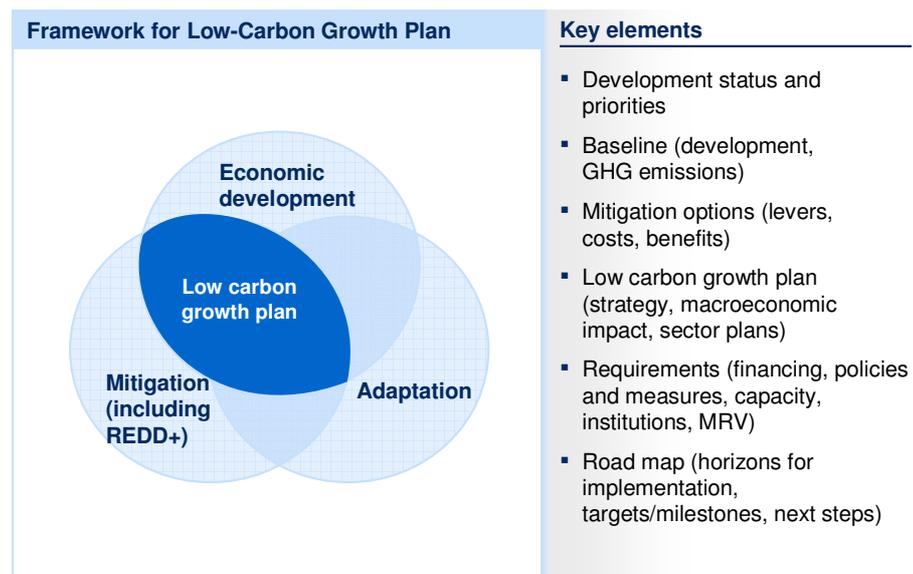
² McKinsey & Company (2009): *Pathways to a Low-Carbon Economy: Version 2 of the Global Greenhouse Gas Abatement Cost Curve*

A common approach and key success factors

Each country has different needs and priorities, so their options for low-carbon growth will vary. However, a common core of processes and analyses can inform choices, as described below. Mitigation, adaptation and economic development all need to be integrated and reflected in a country's development activities. Exhibit 2 shows an outline of what a Low-Carbon Growth Plan typically entails.

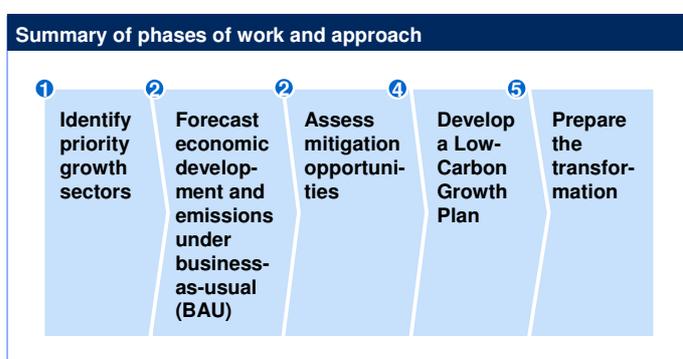
Exhibit 2

Key elements of a Low-Carbon Growth Plan



This white paper focuses on developing a plan for low-carbon growth (excluding the land use and forest sector, which is covered in a separate white paper).¹ Such a plan can be developed using the following framework:

- **Identify priority growth sectors.** This includes reviewing the economy’s historic growth and the natural endowments and man-made factors that will be the source of the economy’s future growth. It includes an assessment of the barriers to economic development and identifies which sectors have high potential for growth if some of these barriers can be removed.
- **Forecast economic development and emissions under a business-as-usual scenario.** This forecast is used to derive the mitigation opportunities.
 - Develop a business-as-usual (BAU) economic growth path based on detailed analysis of key sectors (including GDP and employment forecasts)
 - Develop the emissions baseline for all sectors, based on the BAU growth path
- **Assess the mitigation opportunities** (impact on emissions, cost and feasibility) and their socioeconomic impact for the most important sectors
- **Develop a Low-Carbon Growth Plan.** After prioritising the mitigation opportunities, a revision of sector strategies is possible, which reflects the impact of the mitigation measures and emphasises lower-carbon growth opportunities. Combined, these sector strategies can form a low-carbon growth plan, including forecast GDP, employment and emissions. The plan also needs to specify financing needs and sources.
- **Prepare the transformation.** Implementation should start from a platform of broad consultation across all institutions and civil society. In order to drive a major shift of the economy, new or strengthened institutions are required. Furthermore, capacity and capabilities may need to be built up. A plan should also specify how ministries and other constituencies work together to lead change. To the extent that the plan relies on international funding for adaptation and REDD+, the institution managing low-carbon growth may need to be



¹ The elements of REDD+ and adaptation plans are outlined in *Developing a National REDD+ Strategy* and *A National Strategy for Adaptation to Climate Change*

linked to institutions managing those processes. Enabling policies must also be put into place to support the transformation. It may be necessary to run pilots to learn about the most suitable approach for some new areas.

Finally, partners to provide the necessary technical and financial support need to be identified and engaged. Integrating expert opinion and broad consultation with business, civil society and the public enhances the success of the integration of the plan into national, regional and sectoral growth plans.

STEP 1: IDENTIFY PRIORITY GROWTH SECTORS

The first step involves a thorough assessment of the country's economic and environmental state (including current emissions levels), as well as its economic development trajectory. This assessment usually already exists in the context of national development plans, poverty reduction strategies and emissions baselines, but may need updating in some countries.

- **Review the economic growth and emissions trajectory to date** to quantify and prioritise the main sources of economic growth and emissions but also to identify the impact of past infrastructure investments and development plans.
- **Review the most important sectors in the economy**, with a view to identifying the most important sectors in terms of value added, employment and growth. Where a sector is deemed to have high potential but has not been developed yet (e.g., tourism), it is important to understand what barriers have constrained its development so far and what needs to change so that these barriers will not be obstacles in the future.
- **Identify the priority sectors for development**, based on a combination of their current performance, intrinsic potential and ease of attracting investment (both domestic and foreign). The portfolio of sectors targeted should include both short-term, low-risk opportunities (e.g., based on existing resources) and longer-term, higher-risk ones (e.g., reliant on infrastructure or human capital that has not been developed yet).

Example of tourism in Costa Rica



Many rainforest nations aspire to use the beauty of their natural resources to attract tourists and build a fast growing tourist sector. Costa Rica is one of the most successful. In 2008, 2.5 million tourists contributed 7.8 percent of GDP and 3 percent of employment. Many visited Costa Rica's 32 national parks, 8 biological reserves, 13 forest reserves and 51 wildlife refuges. But few visitors are specialist ecotourists. Rather, ecotourism helps define Costa Rica's brand, even for those who don't venture away from the beach. A reputation for safety and stability, frequent air connections to main markets and large-scale investment by international hotel chains around cities and beaches are other critical success factors.

STEP 2: FORECAST ECONOMIC DEVELOPMENT AND EMISSIONS UNDER BUSINESS-AS-USUAL

Step 2a – Develop economic forecasts by sectors. Develop realistic forecasts for the country's economic development over the relevant time period, e.g. until 2030, based on a combination of its achievements to date, aspirations and a realistic assessment of its potential. The intention is not to create a predictive macroeconomic model, but to simulate the contributions of the most important sectors to GDP and employment under different future scenarios.

This process should involve the following steps:

- **Collate latest information on the contributions of different sectors to GDP and employment.** These vary substantially between countries: for example, most developed countries have a high GDP contribution and emissions from the transport sector, whereas in many developing countries, forestry is a major source of emissions but rarely a large contributor to GDP.
- **Combine these data with assumptions for future development into a BAU scenario.** This BAU scenario assumes the development of each sector based on the best government assessment in a hypothetical future without carbon constraints or incentives. This BAU scenario will be the basis for the emission baseline and for the development of mitigation and adaptation options. Ultimately, it will be compared to a climate-compatible growth plan to be developed in Step 3.
- **Review and refine the BAU scenario with national and international sector experts** for realism and robustness. Non-renewable resources may be physically constrained: for example, it might be unrealistic to project timber production well beyond global demand. There are fewer natural constraints to



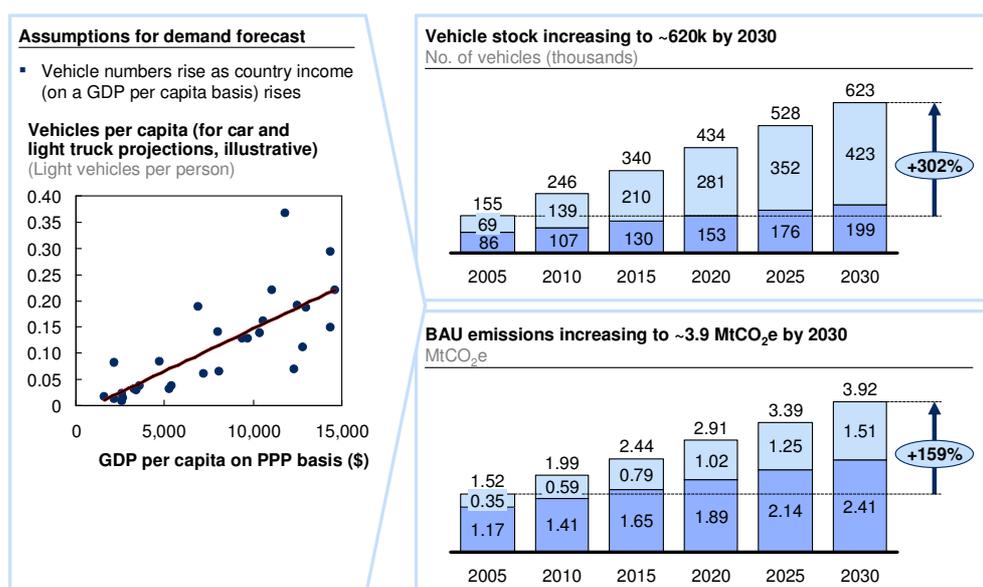
the development of the manufacturing or service sectors, but in many developing nations these sectors have been held back by poor infrastructure and in some cases investor concerns.

Step 2b – Develop an emissions forecast by sector. Develop estimates for emissions growth for the most important sectors of the economy for the same timeframe, assuming no major behavioural or technology changes. In this paper the process is outlined in general terms valid for all sectors of the economy – emissions from LULUCF are covered in more detail in the paper *Developing a National REDD+ Strategy*.

- **Identify the most important sectors** in terms of their current and future emissions profile
- **Translate economic activity into emissions.** Depending on data availability for the country, there are two relevant approaches for computing an emissions baseline:
 - Obtain official or recognised forecasts of sector and emissions development that tally with the economic activity projected for that sector, or
 - Project the sector's growth through a combination of detailed models of the most important growth factors within the sector and whole-economy growth or regression analysis. Exhibit 3 provides an example of this approach.

Exhibit 3

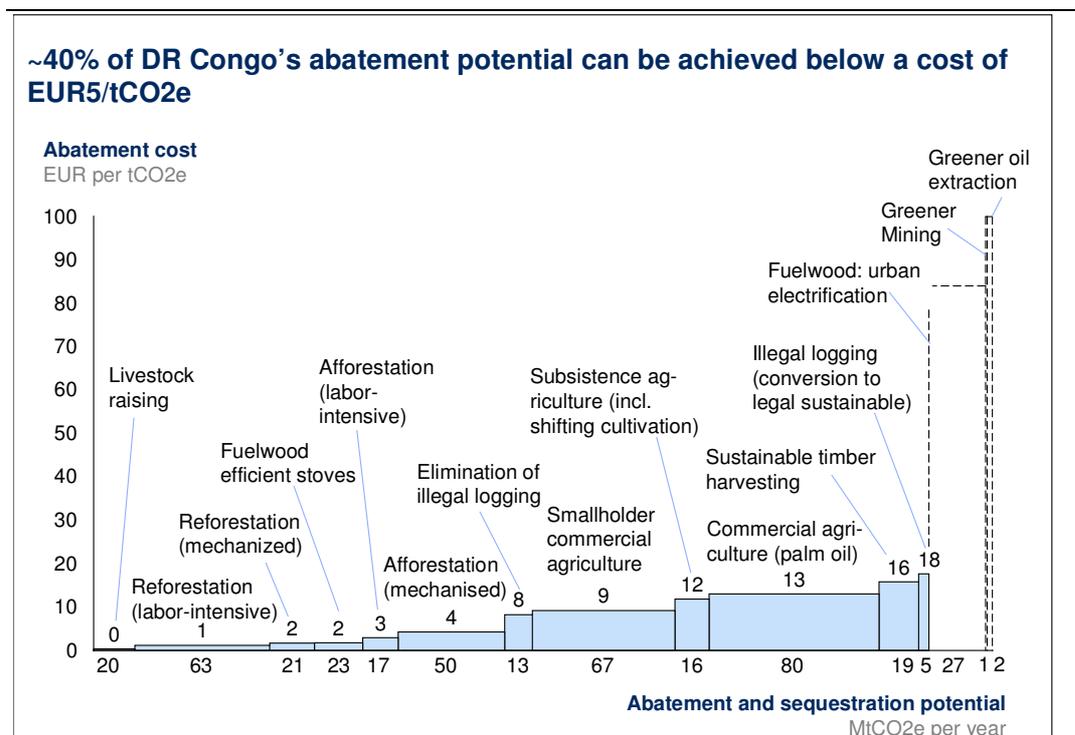
Transport emissions in Papua New Guinea will increase by a factor of 2.5 by 2030



STEP 3: ASSESS THE ECONOMICS OF GREENHOUSE GAS (GHG) MITIGATION

Develop a quantitative assessment of the economics of GHG mitigation options, including the volume and cost for the available mitigation measures within each sector. Understanding the economics of GHG mitigation is a critical step in developing a low-carbon plan. A number of approaches are possible, including macroeconomic models and microeconomic abatement cost curves. See Exhibit 4 for an example.

Exhibit 4



McKinsey analysis shows that the lowest-cost abatement options are usually in energy efficiency. Investments reducing energy consumption in houses, transport and industry often have a positive payback (and therefore result in negative cost on an abatement cost curve). While the current abatement volumes from energy efficiency are relatively low in many developing countries, it is important to introduce these technologies as the economies grow and household income rises. Abatement in land use change and forestry is the biggest source of mitigation in many developing countries (covered in *Developing a National REDD+ Strategy*). Abatement in the power sector is often more expensive, but may be easier to implement. A shift to renewable energy also has the added advantage of enhancing energy security and in many countries saving valuable foreign currency by reducing energy imports.

STEP 4: DEVELOP A LOW-CARBON GROWTH PLAN

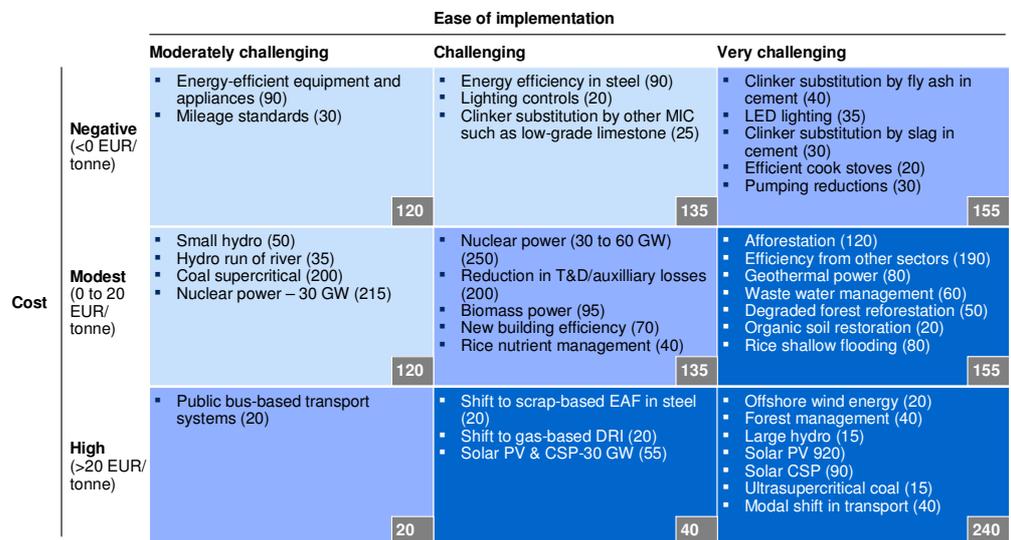
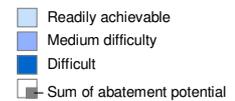
The fact base produced in Steps 2 and 3 is the foundation for the Low-Carbon Growth Plan. Low-carbon growth should achieve similar or better development outcomes as BAU growth, but with substantially lower carbon intensity. This typically means pursuing aggressive growth in all low-carbon sectors, while taking steps to decarbonise other sectors through investments ranging from agricultural programmes aimed at increasing yields to developing renewable power sources.

- Moving from assessment of options to a holistic plan.** Once a comprehensive picture emerges of the various mitigation options and most promising low-carbon growth sectors, it is important to prioritise and sequence the available levers. By grouping, and then categorising levers according to the two main themes of cost and ease of capture, it will then be possible to determine which groups of levers the country should start capturing now, versus which opportunities should be captured over time and which opportunities the country should invest in for future capture. Exhibit 5 contains an example output for India.

Exhibit 5

Feasibility of capturing abatement potential

Abatement potential in million tonnes CO₂e, 2030



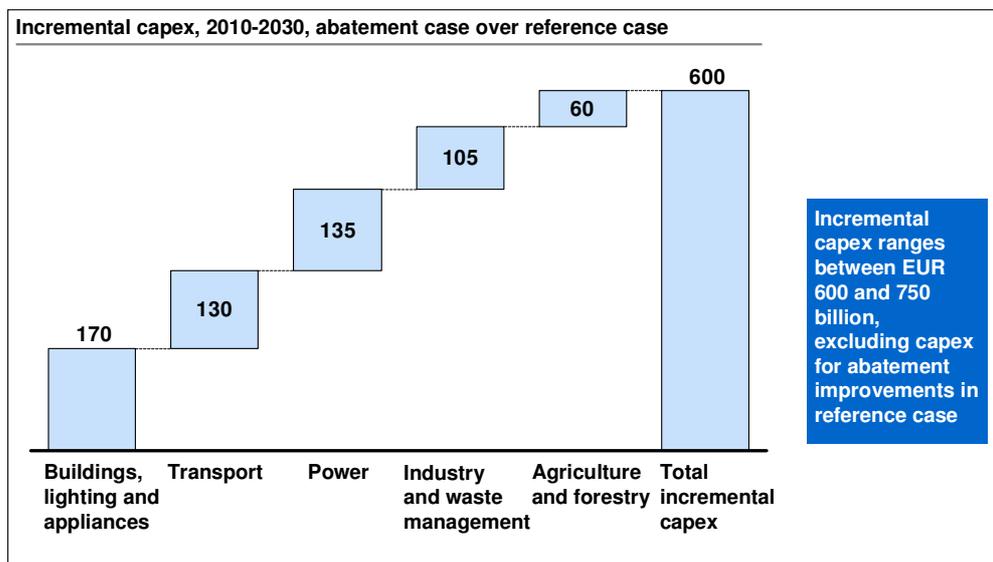
- Revise sector strategies to reflect the impact of GHG mitigation and adaptation to climate change.** These strategies should reflect the abatement measures outlined in the cost curve (Exhibit 4) and prioritised in the previous step (Exhibit 5). In most cases, this involves investment to decarbonise a sector (e.g., by

switching to renewable power). Some of these initiatives may have a negative abatement cost, but will need support to overcome high upfront capital costs, e.g., solar photovoltaic cells for rural electrification, which pay for themselves over time as they do not have any fuel costs. An example of the capital requirements for India is presented in Exhibit 6. It is important to specify the sources of finance, including the need for international support.

Exhibit 6

Incremental capital needed by sector

EUR billion

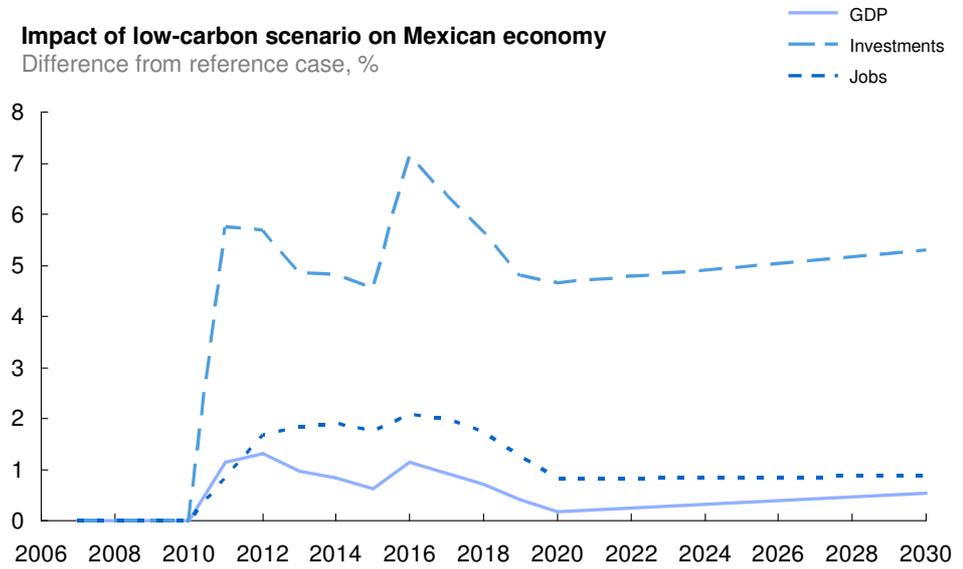


- Combine these revised sector strategies into a low-carbon growth plan and assess the macro-economic implications.** A thorough macroeconomic model can be developed to assess the revised sector strategies on relevant macro-economic indicators such as GDP, jobs and investments. Conducting similar exercises for other countries shows that, counter to popular perceptions, the economic implications of a climate compatible growth strategy have only a modest effect on the country's economy and often prove to be positive in the long run. For example, reducing emissions by 54 percent compared to 2030 BAU levels in the case of Mexico would actually increase GDP growth by 1 percent, and create 0.5 million new jobs (Exhibit 7).

Exhibit 7

A low-carbon development path for Mexico will increase GDP, investments and jobs compared to the reference case

Impact of low-carbon scenario on Mexican economy
Difference from reference case, %



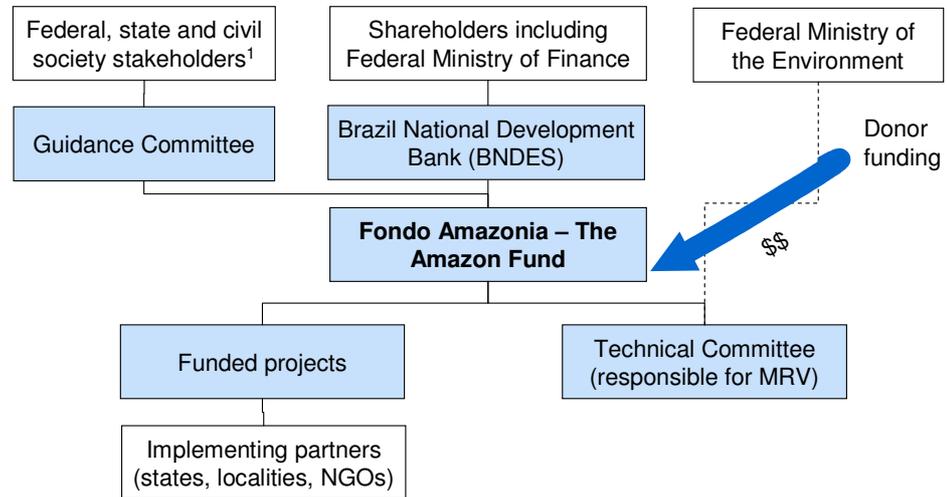
STEP 5: PREPARING THE TRANSFORMATION

Since the implementation of a Low-Carbon Growth Plan will impact the most important economic sectors of a country, it needs to be driven by the national leadership and grounded in broad stakeholder support. Broad alignment of national and international stakeholders and an institutional framework to drive the implementation across different sectors are drivers for success.

- **Stakeholder consultation should ideally be done across all institutions.** This will include government bodies at central, regional and community levels, NGOs, aid agencies and research institutions. Broad national support at all levels will facilitate implementation, and endorsement by the national leadership is a key factor to this.
- **Low-carbon development needs to be integrated into national planning and development efforts, and the responsibilities of institutions responsible for low-carbon growth need to be identified.** While the key responsibility for implementation usually remains with the responsible ministries (e.g., power, transport, agriculture, forestry), some countries may wish to establish a central institution for coordinating the work of ministries and other branches of government. There are also new functions that need to be established, with the corresponding institutional home (e.g., monitoring-reporting-verification for mitigation action, international financial support).
- **It may be appropriate for the relevant national or provincial institution to take an interim form while the international institutions dealing with climate change are taking shape.** This is particularly appropriate if the institution responsible for low-carbon growth planning also has responsibility for REDD+ and adaptation. Only one large institution in this field, the Brazilian Amazon Fund, is already operating, and its institutional architecture is still evolving. The Amazon Fund (see Exhibit 8) is an example of an organisation that is deliberately semi-independent from the federal government (it is managed by the Brazil National Development Bank). Elsewhere, such as in the Central Kalimantan province of Indonesia, the institution or institutions to be created are closely integrated to existing provincial government structures.

Exhibit 8

The Brazil Amazon Fund is controlled by the Brazil National Development Bank



¹ The Guidance Committee consists of representatives from relevant federal ministries, the 9 Amazon states and 6 civil society organizations including business and conservation groups

SOURCE: Brazil Amazon Fund

- **The capacity and capabilities of the relevant institution or institutions will need to be developed.** Low-Carbon Growth Planning requires in-depth measurement, analysis and forecasting of GHG emissions under different scenarios. It also makes the reduction of these emissions an explicit objective of policy. The institutions involved in the Low-Carbon Growth Plan will need a combination of scientific, technical and economic skills, the ability to coordinate within and outside government and an ability to implement the aspects of the plan that fall within their remit.
- **The feasibility of elements of the Low-Carbon Growth Plan should be tested with local pilots.** Pilot projects to decarbonise the economy (e.g., a power station or forest plantation) will help refine the estimates used in the Low-Carbon Growth Plan and demonstrate which initiatives have the most impact on development and emissions. Pilots should be evaluated rigorously and the successful ones scaled up.
- **Partnerships will need to be developed at national and international levels.** At a national level, the public, private and non-profit sectors will have to work together to achieve the Low-Carbon Growth Plan. At the international level, partners can provide technical and financial support, help to plug gaps and share best practices with other countries.

KEY SUCCESS FACTORS

Low-carbon growth holds many benefits for developing countries, but may also require difficult trade-offs and adjustments. Because of this, it is critical that the overall strategic approach enjoy broad political support and be robust to challenges and changing priorities during its implementation. Exhibit 9 sets out a number of factors that are required to create a successful low-carbon growth plan and its value to nations.

Exhibit 9

Key success factors and value for nations

A good low-carbon growth plan is ...

- Owned by the **senior leadership**
- Grounded in scientific and economic **analyses**
- **Ambitious** (but realistic)
- Supported by major **stakeholders**
- Integrated into **national strategy** and policies
- **Specific** in actions, goals, and timelines
- Clear on **requirements** for funding, institutions, and capacity

... and enables nations to ...

- **Achieve** development goals in a sustainable way
- **Respond** to climate change ahead of time
- **Align** all internal stakeholders
- **Prioritise** resources towards the most impactful levers
- **Understand** the technical, human, and financial requirements
- **Negotiate** appropriate support based on a solid fact base

* * *

We hope this white paper is useful to decision makers in developing countries that aspire to capture the opportunities and manage the challenges of a low-carbon growth development path.



Glossary

ACT	: Artemisinin based Combination Therapy
ADB	: Asian Development Bank
A/R	: Afforestation/Reforestation
BAU	: Business As Usual
CAGR	: Compound Annual Growth Rate
CCS	: Carbon Capture and Sequestration
CCD	: Climate-Compatible Development
CfRN	: Coalition for Rainforest Nations
CO _{2e}	: Carbon dioxide equivalent
CPO	: Crude Palm Oil
DRC	: Democratic Republic of the Congo
DDT	: Dichloro-Diphenyl-Trichloroethane
EACC	: The Economics of Adaptation to Climate Change (report by World Bank)
ECA	: Economics of Climate Adaptation
ENSO	: El Niño-Southern Oscillation
EVN	: Economic Value to the Nation
FAO	: Food and Agricultural Organization of the United Nations
GCM	: General Circulation Models
GDP	: Gross Domestic Product
GHG	: Greenhouse Gas
GIS	: Geographic Information System
ICRAF	: The International Centre for Research in Agro-Forestry
ICE	: Internal Combustion Engine
IFC	: International Finance Corporation

IFPRI	: Institute for Food Policy Research
IPCC	: Intergovernmental Panel on Climate Change
IRR	: Internal Rate of Return
IRS	: Indoor Residual Spraying
ITTO	: International Timber Trade Organization
IWG-IFR	: Informal Working Group on the Interim Finance for REDD
LDV	: Light Duty Vehicle
LLINs	: Long-Lasting-Insecticide-treated bed-Nets
LNG	: Liquefied Natural Gas
LUCF	: Land-Use Change and Forestry
LULUCF	: Land Use, Land-Use Change and Forestry
MDV	: Medium Duty Vehicle
Mt	: Million (metric) tonnes
MPI-BGC	: The Max Planck Institute for BioGeoChemistry
MRV	: Monitoring, Reporting and Verification
NSO	: National Statistical Office
NPV	: Net Present Value
PPP	: Purchasing Power Parity
PV	: Present Value
REDD	: Reducing Emission from Deforestation and Forest Degradation
REDD+	: Reducing Emission from Deforestation and Forest Degradation and Enhancement of Carbon Stocks
RIL	: Reduced Impact Logging
Solar PV	: Solar Photo Voltaic
SFM	: Sustainable Forest Management
UNFCCC	: United Nations Framework Convention on Climate Change
WHRC	: Woods Hole Research Center

WHO : World Health Organization