Low Carbon Green Growth Roadmap for Asia and the Pacific

Turning resource constraints and the climate crisis into economic growth opportunities

A summary for policymakers

UNITED NATIONS ESCAP
Economic and Social Commission for Asia and the Pacific

KOICA
Korea International Cooperation Agency

ESCAP promotes regional cooperation for inclusive and sustainable economic and social development in Asia and the Pacific, a dynamic region characterized by growing wealth, diversity and change, but also challenged with persistent poverty, environmental degradation, inequality and insecurity. ESCAP supports member States with sound strategic analysis, policy options and technical cooperation activities to address key development challenges and to implement innovative solutions for region-wide economic prosperity, social progress and environmental sustainability. ESCAP, through its conference structure, assists member States in forging a stronger, coordinated regional voice on global issues by building capacities to dialogue, negotiate and shape the development agenda in an age of globalization, decentralization and problems that transcend borders. A key modality for this strategy is the promotion of intraregional connectivity and regional integration.

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A message from the Executive Secretary of ESCAP

The Asia-Pacific region stands at an important crossroads: high levels of economic growth have lifted great numbers of people out of poverty, and many of our development goals are now within reach. The region cannot realize this promise, however, by following the conventional growth strategies. If our region is to sustain the high growth needed to achieve our development goals, then we must shift to a different growth trajectory – one which is more resource and carbon efficient.

Green growth can help us to achieve these goals by turning crises into opportunities and promoting the development of an inclusive, resilient and sustainable Asia-Pacific region. Realizing the promise of green growth requires bold and ambitious transformation of economic systems, reshaping the very structure of economies, ranging from governance and fiscal policies, to lifestyles and infrastructure.

This Roadmap provides policy-makers in the region with a comprehensive list of policy options and practical implementation strategies to consider adopting, based on their own national priorities and circumstances.

Noeleen Heyzer
Under-Secretary-General of the United Nations and
Executive Secretary of ESCAP

A message from the Chairman of the Presidential Committee on Green Growth of the Republic of Korea

The concept of 'low carbon green growth' as a nation's new development paradigm was first presented to the world by President Lee Myung-bak of the Republic of Korea in his speech on 15 August 2008, commemorating the 60th anniversary of the Republic. It was noteworthy for its emphasis on climate change mitigation and green innovation as new growth engines.

The Korean Government has been pursuing green growth in a comprehensive and vigorous way since then. In parallel to domestic efforts, the Korean Government has also been promoting green growth as a global agenda, especially as a new development strategy for the emerging and developing economies. Among its numerous initiatives, it launched the East Asia Climate Partnership initiative as well as the Global Green Growth Institute. In this way, Korea is engaged in the international effort to open a new chapter in the history of the human civilization - a chapter for a planet-responsible new civilization.

The Korean Government was pleased to sponsor this Roadmap as part of this effort and is willing and ready to offer assistance to fellow regional countries for their respective green growth, as well as to play a leading role in regional cooperation for green growth.

Soogil Young, Ph.D.
Chairman
Presidential Committee on Green Growth
Republic of Korea

Roadmap directions

Developing countries in the Asia-Pacific region have experienced rapid economic growth in recent years, taking advantage of the opportunities brought about by globalization and an export-led growth model. High economic growth rates have helped lift millions out of poverty and achieve significant development gains. The high growth rates that the region is proud of, however, can only be sustained if resource constraints and climate change are adequately addressed.

To do so, the region has to embrace a new growth strategy that can turn the trade-off between economic development and environmental protection into a win-win synergy in which "going green" drives economic growth.

The concept of green growth emerged in the Asia-Pacific region to turn resource constraints and the climate crisis into an economic opportunity that generates a double dividend (higher growth with lower environmental impact) by improving the efficiency of resource use and increasing investments in natural capital to drive economic growth.

Realizing the promise of green growth will require a bold and ambitious transformation of the economic system. The "visible structure" of the economy, comprising such physical infrastructure as transport, buildings and energy systems, together with the "invisible structure", which encompasses market prices, governance, regulations and lifestyles, have to be re-oriented to resource efficiency. This Roadmap explains how to begin such a transformation.

The *Low Carbon Green Growth Roadmap for Asia and the Pacific* consists of several products:

1. This summary for policymakers
2. A manual, which lays out the challenges for the region, the paradigm of the green growth
3. Sixty-three fact sheets that provide detailed information and analysis of the policy options identified in the manual, including strengths, challenges and implementing strategies
4. Fifty-one case studies that provide detailed information about successful practices that can be found in the Asia-Pacific region and elsewhere
5. Eight policy papers that provide in-depth analysis for specific sectors, such as fiscal reform, urban planning, transport, green buildings, water infrastructure and trade

All products can be found in the CD-ROM enclosed in this publication, as well as online at:

www.unescap.org/esd/environment/lcgg/

For more details on the ESCAP green growth initiatives and activities, see www.greengrowth.org and the ESCAP website (www.unescap.org/esd/).

This Roadmap has been prepared under the project "Development of a Low Carbon Green Growth Roadmap for East Asia" with funding from the Korea International Cooperation Agency (KOICA), under the East Asia Climate Partnership. Sincere appreciation is expressed to the Government of the Republic of Korea for their generous support.

Resource constraints, the climate crisis and the need for eco-efficiency

Resource constraints are threatening future growth prospects.

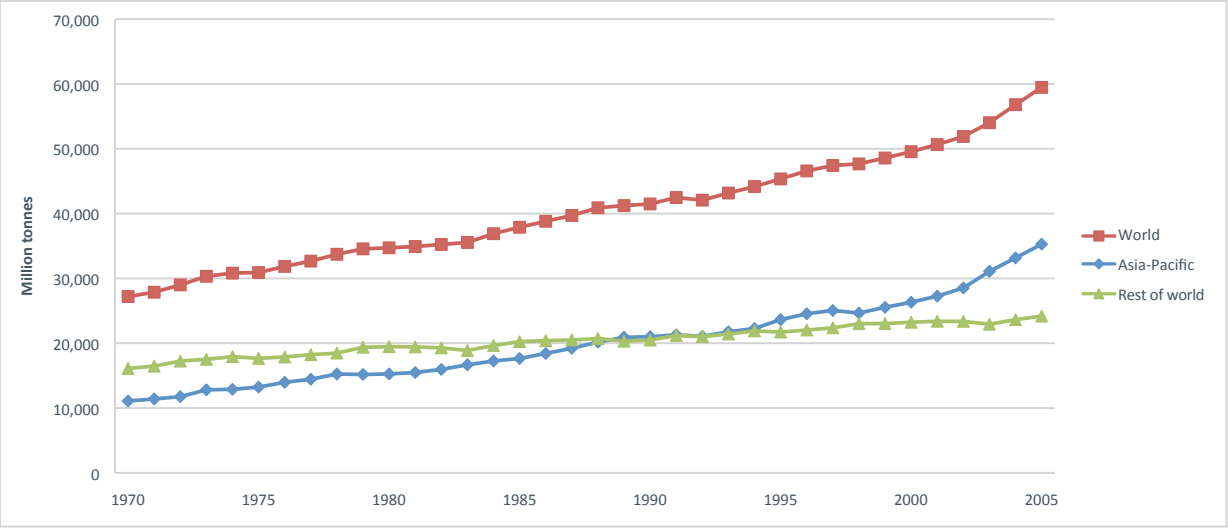
The days of resource abundance and low fuel prices are over. The world is entering a new era of high and volatile resource prices.

The 2012 report of the United Nations Secretary-General's High-Level Panel on Global Sustainability warned that by 2030 the world will need at least 50 per cent more food, 45 per cent more energy and 30 per cent more water.

Countries in the region are particularly vulnerable to energy and food price volatility. ESCAP estimates that in 2011 alone, 42 million people in the Asia-Pacific region were pushed back into poverty due to energy and food price increases. Achievements related to the Millennium Development Goals, in particular poverty reduction, are in jeopardy.

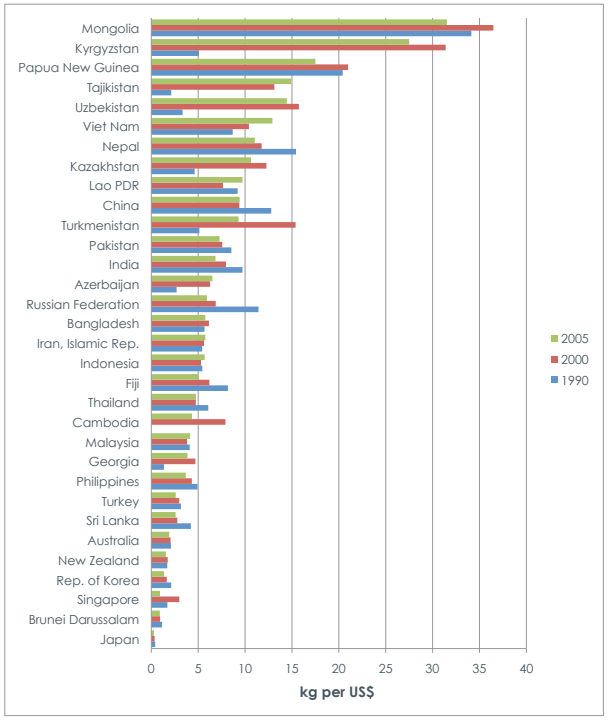
The Asia-Pacific region uses three times the resources as the rest of the world to create one unit of GDP, and between 2000 and 2005 the resource intensity of its economy increased, in contrast to trends in the rest of the world. Resource-intensive growth patterns have exacerbated the vulnerability of the region to resource price volatility while negatively affecting its ecological sustainability.

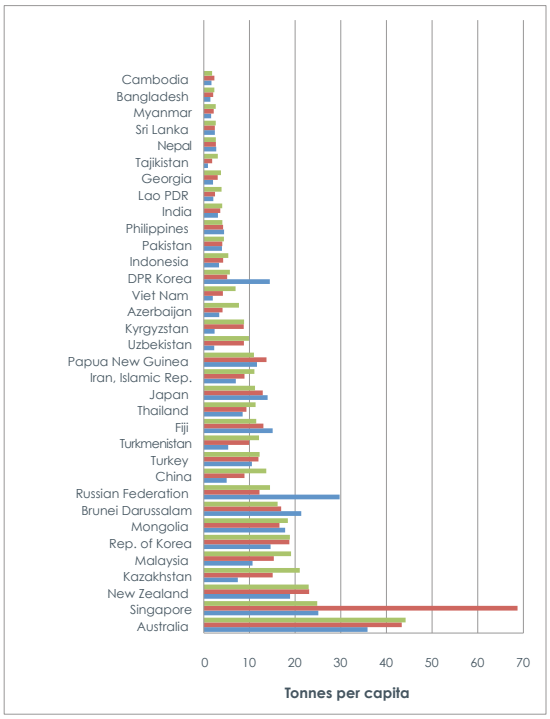
Domestic material consumption per unit of GDP in the world, the Asia-Pacific region and the rest of the world, 1970–2005



Source: CSIRO and UNEP Online Asia-Pacific Material Flows Database, as of March 2011. Available from www.cse.csiro.au/forms/form-mf-start.aspx

Domestic material consumption per unit of GDP and per capita, Asian and Pacific countries





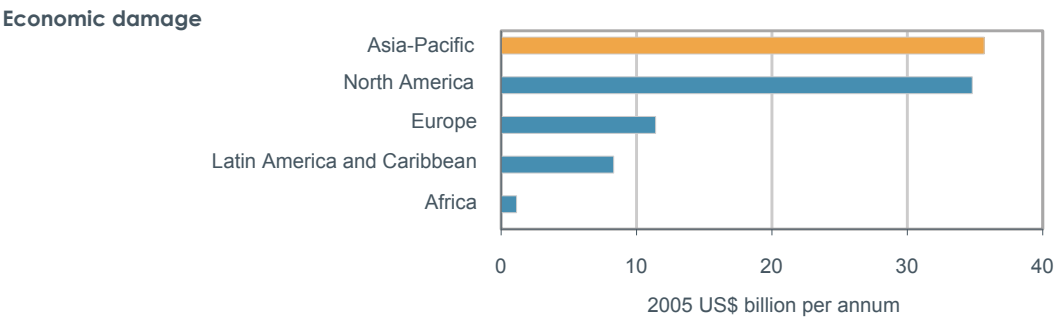
Source: CSIRO and UNEP Online Asia-Pacific Material Flows Database, as of March 2011. Available from www.cse.csiro.au/forms/form-mf-start.aspx

Climate change threatens development gains.

Countries in the Asia-Pacific region are the most vulnerable to climate-related disasters. As much as 85 per cent of deaths and 38 per cent of global economic losses due to disaster originated in this region from 1980 to 2009. Recent climate-related disasters, such as Cyclone Nargis in Myanmar in 2008 and the floods in Pakistan in 2010 and in Thailand in 2011, have been among the worst ever recorded in those countries.

If we are to limit the rise in global temperature to less than 2° C by 2050, as acknowledged by the parties of the United Nations Framework Convention on Climate Change, global emissions have to reduce by half by that time. The Asia-Pacific region, while emitting relatively low levels of greenhouse gases on a per capita basis, is one of the fastest-growing sources of climate-impacting emissions.

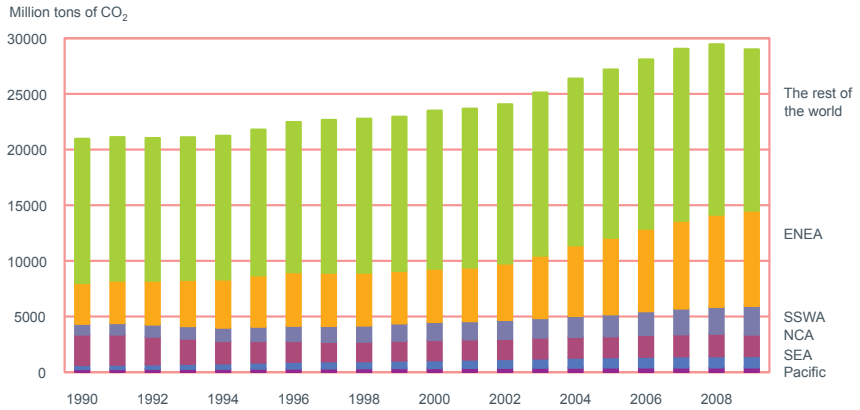
Average annual economic damage by natural disasters in global regions, 2001–2010



Source: ESCAP, Statistical Database based on data from the Emergency Events Database (EM-DAT).

CO_2 emissions in Asian and Pacific subregions and the rest of the world, 1980–2008

Total emissions



Legend:
ENEA – East and North-East Asia SSWA – South and South-West Asia SEA – South-East Asia NCA – North and Central Asia

Source: ESCAP Statistical Database www.unescap.org/stat/data/swweb_syb2011/DataExplorer.aspx based on data from the International Energy Agency

The region needs to urgently improve its ecological efficiency.

Resource constraints and the climate crisis mean that business-as-usual practices are no longer an option and call for a re-examination of resource- and carbon-intensive growth strategies. If we are to raise the standards of living of a growing population, we need to drastically improve the efficiency of using natural capital, and our economies need to become ecologically efficient.

The gap between ecological and economic efficiencies has to be closed.

Eco-efficiency is inclusive of both economic and ecological efficiencies. Renewable energy, such as solar and wind power, is ecologically efficient but not economically competitive under the current market price structure because it is more expensive than fossil fuel. This is a reflection of distorting policies that have warped the true-value pricing of fossil fuels. The market price structure has to be reformed so that solar and wind power become economically attractive.

Market price restructuring has to be done without damaging the economy or affecting the poor. This Roadmap suggests this can be achieved through properly designed environmental tax reform (ETR) and environmental fiscal reform (EFR), shifting taxes from labour and income to resource consumption, based on the principle of revenue neutrality. ETR and EFR can generate a double dividend of creating more jobs and growth while reducing environmental impacts and improving resource efficiency.

Turning crisis into opportunity: Green growth to deliver a double dividend

Low carbon green growth: A new growth strategy for Asia and the Pacific

Green growth can turn crisis into opportunity and help develop an inclusive, resilient and sustainable Asia-Pacific region. Green growth can improve energy, water and food security and help achieve the MDGs.

The concept of green growth was born in the Asia-Pacific region and is now practised globally.

The concept of green growth was first introduced in the Ministerial Declaration adopted at the Fifth Ministerial Conference of Environment and Development in Asia and the Pacific (MCED-5), convened by ESCAP in 2005 in the Republic of Korea.

Since then, many governments have turned to green growth approaches, most notably the Republic of Korea, which was the first country to declare, in August 2008, low carbon green growth as its national vision, with the conviction that addressing the resource and climate crises could drive economic growth.

The potential of a green paradigm to drive growth and employment creation was later acknowledged by heads of State across the world in the aftermath of the 2008 financial crisis, with many stimulus packages including green components.

The Green New Deal endorsed by the G-20 was the first collective policy initiative for which the top global political leadership recognized the potential synergies of "going green" and "gaining economic growth".

Green growth is a smart strategy for sustainable development and a process for arriving at a green economy.

Green growth is an implementing strategy to achieve sustainable development that focuses on improving the eco-efficiency of production and consumption and promoting a green economy, in which economic prosperity materializes in tandem with ecological sustainability.

Green growth provides a positive agenda for pursuing the three pillars of sustainable development – economic growth, social inclusiveness and environmental protection – by seeking to develop synergies instead of focusing on the trade-offs and trying to balance them.

Green growth is a crucial economic strategy for developing countries.

Rather than imposing an environmental conditionality on development or attempting to commercialize nature, green growth is a strategy to sustain the growth necessary to reduce poverty in the face of resource constraints and the climate crisis. A green growth approach is a way to generate and sustain development gains and achieve higher and better-quality growth in the medium and long terms.

Green growth provides a unique leapfrogging opportunity for developing countries.

Low carbon green growth can be a leapfrogging strategy for developing countries to pursue economic development without repeating the conventional "grow first, clean up later" path. By introducing a tax system based on resource consumption rather than only on income and labour, developing countries can pursue a cleaner and more efficient development path. A large share of the infrastructure required in the region still needs to be developed – this provides a unique opportunity to avoid the high-carbon, environmentally destructive path that industrialized countries have wedded themselves to through previous infrastructure decisions.

Realizing the promise of green growth requires a bold and ambitious transformation of the economic system.

A green economy will not materialize through incremental changes. A shift towards green growth requires a fundamental system change, restructuring both the visible (physical infrastructure) as well as the invisible structures of the economy (market prices, fiscal policies, institutions, governance and lifestyles).

The extent to which green growth can deliver a double dividend (such as higher growth with lower environmental impact) depends on the breadth and depth of the system change.

Can developing countries with limited technological and financial resources pursue green growth?

Yes. Financing and green technologies are necessary but not sufficient. System change, such as market price restructuring and designing infrastructure to be eco-efficient, is more critical in starting the process of green growth.

Is green growth only for developing countries?

No. For developing countries, green growth can be an economic strategy to sustain growth in the face of resource constraints and climate crisis; for industrialized countries, it can be a strategy to reverse the current economic downturn by generating jobs and stimulating greater growth.

Green growth will not happen if left only to the market – government must drive it.

The greening of the economy will not happen automatically through the market. This is mainly due to two gaps. First, there is a time gap between short-term costs and long-term benefits. Second, there is a price gap between current market prices and the real cost of natural resource use and ecosystem services. Governments have to close these two gaps through economic system change. Although the market has an important role, only governments can lead the systematic transition.

Strong government leadership and political commitment are required to bring businesses and the public on board.

A huge basket of business opportunities will emerge from green growth that the private sector should seize on rather than resist or block.

At the same time, green growth must engage the public. People need to support the paradigm shift by responding with positive public acceptance and by recognizing the benefits of lifestyle changes aimed more at the quality of life rather than the quantity of consumption.

Governments have to actively promote a forward-looking consciousness among those in office and the general public to mobilize political support for low carbon green growth.

An inclusive social policy has to go hand in hand with the transition towards a green economy.

In the long run, a green economy can produce better outcomes in terms of poverty reduction because it increases growth prospects, reduces the vulnerability of socio-economic systems to external shocks and crises and sustainably manages the natural resources that underpin such systems.

There is no guarantee, however, that the costs and benefits of the transition will be evenly distributed. Thus, it is critical that a system change towards green growth be supplemented by inclusive social policies that ensure the fair distribution of the costs and benefits.

Countries in the region are already taking action.

China has introduced a number of measures for green growth since 2005 and resource and energy efficiency were featured prominently in both its Eleventh and Twelfth Five-Year National Social and Economic Development Plans. In 2008, India adopted a National Action Plan on Climate Change, encompassing an extensive range of measures, including eight national missions focusing on renewable energy, energy efficiency, clean technologies, public transport, resource efficiency and tax incentives. Kazakhstan introduced elements of green growth into the National Sustainable Development Strategy since 2007 and adopted the Zhasyl Damu – Green Development Strategy 2030. Cambodia developed a National Green Growth Roadmap in 2010.

The Republic of Korea unfurled the most comprehensive action towards green growth when in 2008 the president declared low carbon green growth as the national vision for the country to follow for the next 60 years. That milestone was followed by the launching of a National Green Growth Strategy, complete with five-year midterm plans and implemented by a coordinating institution, the Presidential Committee on Green Growth, under the legal framework of the Framework Act on Low Carbon, Green Growth.

Collective action can maximize returns.

Fully realizing the potential of green growth will require collective action. System change entails risks and uncertainties, and some countries may be reluctant to be the first movers. Collective action and partnerships can reduce the risk and uncertainty and shepherd the transition towards a green economy.

The need for regional cooperation in the Asia-Pacific region on green growth was recognized at the Fifth Ministerial Conference on Environment and Development in Asia and the Pacific (MCED-5) in 2005, where the Seoul Initiative on Green Growth was launched. In Kazakhstan in 2010, MCED-6 highlighted the need for inter-regional cooperation and delegates endorsed the Astana Green Bridge Initiative to link Europe, Asia and the Pacific through green growth.

The region needs to step up such initiatives.

A global partnership is urgently required.

Although the policy framework for system change is the most critical aspect in shifting towards green growth, developing countries still need financial, technological and capacity building support to start up the green growth process. A global partnership is urgently needed to enable developing countries to adopt green growth policies and initiatives that can help meet their development goals. The 2012 United Nations Conference on Sustainable Development (Rio+20) provides a unique opportunity to do this.

As it pioneered the concept of green growth, the region can further drive the discussions and shape the global agenda on the green economy and green growth. This will require enhancing a coordinated Asian and Pacific voice and leadership. The region is already spearheading such global partnership at the regional level through a number of initiatives such as the East Asia Climate Partnership of the Republic of Korea and the Global Green Growth Institute.

A low carbon green growth roadmap for Asia and the Pacific

The concept of green growth was not born out of economic theory. Rather, it is a vision put forward by policymakers in an attempt to find practical ways of reconciling economic growth and environmental sustainability. So far, no country has yet to follow a green growth path. There are some positive examples. But these are mainly found in industrialized countries and are limited in scope. There is not yet an established economic theory or prescription for green growth.

Although many countries in the region are already following through on various policies, there is no single comprehensive blueprint that provides guidance on how to pursue a green growth path.

This Roadmap aims to fill this gap, by providing policymakers in the region with a comprehensive set of policy options and implementing strategies necessary to pursue system change for low carbon green growth.

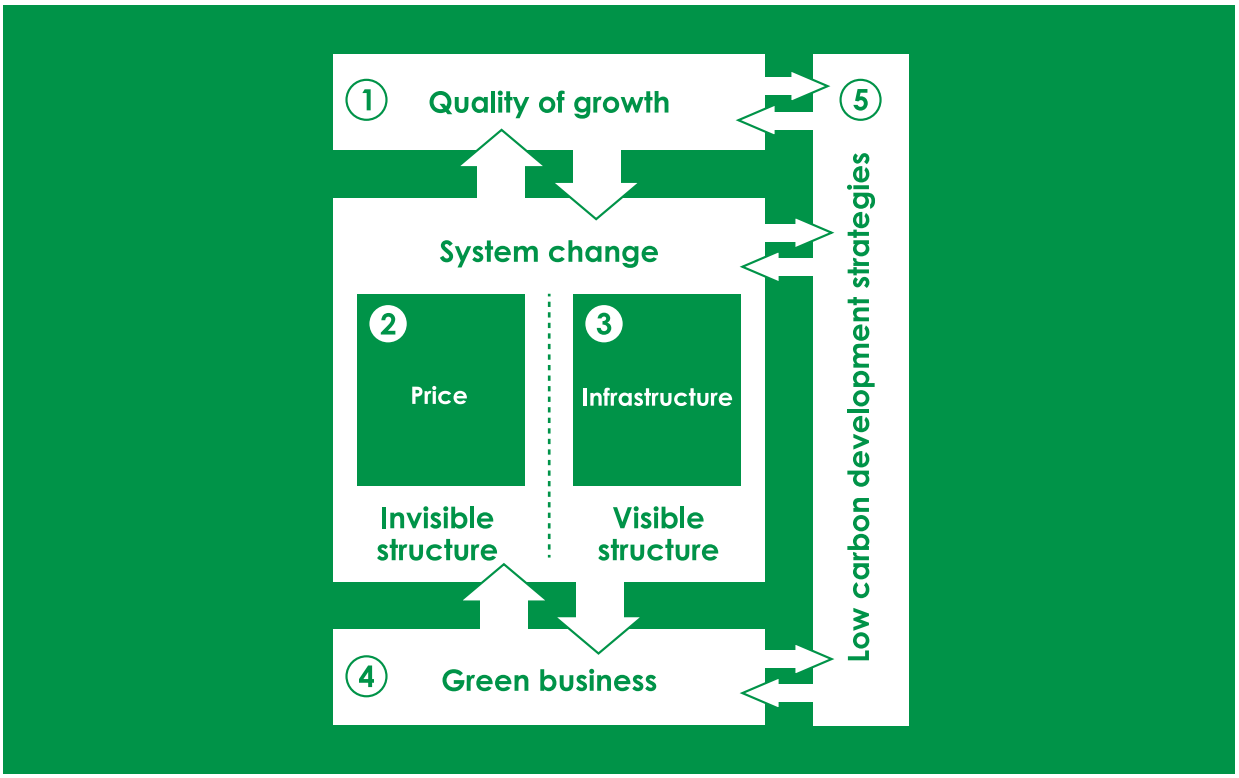
Five tracks to pursue low carbon green growth.

There is no one-size-fits-all approach to low carbon green growth. Socio-economic circumstances and political priorities differ from country to country; so should green growth strategies. There are, however, some key areas of policy intervention that can introduce the system change required for green growth that should be the backbone of any green growth strategy.

This Roadmap identifies five main tracks on which to drive the system change for low carbon green growth:

1. Improving the quality of growth and maximizing net growth
2. Changing the invisible structure of the economy: Closing the gap between economic and ecological efficiencies
3. Changing the visible structure of the economy: Planning and designing eco-efficient infrastructure
4. Turning green into a business opportunity
5. Formulating and implementing low-carbon development strategies

Five tracks for low carbon green growth



TRACK 1: Improving the quality of growth and maximizing net growth

Focusing only on maximizing the quantity of growth will in the long run undermine the prospects of sustaining it. Countries in the Asia-Pacific region, both industrialized and developing, need to shift away from the conventional economic paradigm of maximizing production (as measured by GDP). What is paramount at this point in the world's history to protect resources and thus future growth is a new development paradigm focused on improving the quality of growth, and in particular the economic, social and ecological qualities of growth patterns. Employment generation, economic resilience, social inclusiveness and ecological sustainability are all important goals for any economy striving for a better quality of growth.

Growth patterns of the countries in the region show different economic, social and ecological qualities. Countries at a similar level of per capita income exhibit different ecological footprints, levels of social cohesion and economic resilience.

Many countries are already moving beyond the GDP-only paradigm and taking a more balanced and sustainable perspective to economic growth strategies. In China after decades of rapid growth, for example, the quality of growth is now considered more important than its speed and bold quantified targets for energy and resource efficiency and air pollution reduction have been introduced. Similarly, India is integrating ecological values into its national accounts.

Green growth is an attempt to improve the ecological and economic qualities of growth patterns by minimizing the hidden ecological and economic losses.

Current market prices do not capture the social and ecological values of consumption and production and this leads to increasing losses that are not reflected in GDP or other statistics of economic growth. If the costs related to pollution and environmental degradation or lost economic opportunity costs such as traffic congestion were factored in, the actual net growth often would be much lower than the calculated GDP growth rate.

Green growth strategies can maximize net growth by reducing the hidden ecological and economic costs (GDP losses) that erode the human, social and natural capital.

Green growth can also deliver higher growth in the long run through innovation and efficiency gains triggered by the system change.

Quality of growth is a broader concept going beyond the idea of green growth. Quality of growth provides a conceptual basis and underpins the pursuit of green growth. Green growth has to be a part of an overall policy framework of improving the economic, social and ecological qualities of growth. Quality-of-growth perspectives have to be integrated into socio-economic development planning. As well, modalities to identify and measure hidden GDP losses need to be developed and improved.

TRACK 2: Changing the invisible structure of the economy: Closing the gap between economic and ecological efficiencies

The invisible structure of the economy comprises many factors that affect the way an economy operates; these include the market price structure, lifestyles, institutions and governance, regulations and standards. System change for green growth requires a re-alignment of all these factors towards being as eco-efficient as possible.

In particular, system change for low carbon green growth requires inter-ministerial institutions and in-depth coordination between central, regional and local governments. Long-term plans and targets are also important because they decrease uncertainty for businesses and encourage investments.

The most important factor, however, is allowing prices to reflect the real costs of production and consumption. This requires the use of fiscal instruments, such as taxes and subsidies. The challenge is to introduce such interventions in a way that does not affect the poor or reduce competitiveness but is politically acceptable.

Properly designed environmental tax reforms (ETR) and environmental fiscal reforms (EFR) can achieve this and generate the double dividend of lower environmental impact and higher growth and employment.

ETR entails shifting the burden of taxes from conventional levies on labour and income to environmentally damaging activities, such as resource use or pollution. This proposition is based on the principle of revenue neutrality. ETR can generate a double dividend of more jobs and growth and reduced resource consumption and pollution.

Market price restructuring though ETR and EFR can close the gap between economic and ecological efficiencies.

There has been concern that ETR will negatively affect competitiveness and the poor, and that the hypothesis of the double dividend is not conclusive. However, examples of countries that have tried it show positive results and prove that competitiveness and income regressiveness effects can be effectively tackled.

Although ETR so far has been mainly tried in northern European countries, it has great potential in the Asia-Pacific region. ESCAP analysis shows that a carbon tax would be effective in reducing CO_2 emissions from the region, with the biggest reductions in developing countries while having a positive effect on the economy if the revenue is used to reduce taxes on labour, corporate income or consumption.

Global CO_2 emissions could be reduced by up to 7.86 per cent by 2020 if countries in the Asia-Pacific region alone implemented ETR.

ETR provides a leapfrogging opportunity for developing countries to develop their tax system based on resources and pollution instead of income, thereby putting their economies into a different, more resource-efficient development path.

TRACK 3: Changing the visible structure of the economy: Planning and designing eco-efficient infrastructure

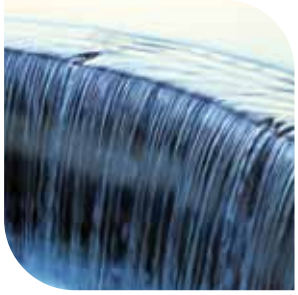
Prices will take a long time to change the design of physical infrastructure. Given the long life span, infrastructure becomes "locked in" to the nature of the design. This takes a toll on the environment and societies if that design is high-carbon, environmentally destructive in nature. It serves economic growth, environmental protection and social inclusiveness needs when the planning and design of infrastructure take into account eco-efficiency criteria.

The carbon intensity and energy efficiency of the future greatly depends on the kind of infrastructure we design and invest in today.

Investing in eco-efficient new infrastructure and the retrofitting of old infrastructures provides great opportunities for economic growth, employment generation and achieving the MDGs.

Policy tools to evaluate infrastructure options need to integrate the concept of eco-efficiency from a life-cycle perspective. For example, when evaluating transport projects, such as a highway, energy consumption and carbon emissions generated from its use cannot be ignored.

Useful tools and mechanisms exist, such as the strategic environmental assessment, environmental impact assessment, life-cycle assessment and other integrated assessments. But these are often not used or are poorly functioning. Achieving eco-efficient infrastructure requires strengthening the use of these tools and mechanisms.



A shift towards eco-efficient infrastructure requires:

- **Urban areas** to be planned and designed as compact and walkable, mixing different land uses and enhancing public and green spaces.

  The region is undergoing rapid urbanization. Urban sprawl and car-centred development are putting the liveability and sustainability of healthy cities at risk. Cities and towns require an urgent shift towards eco-city development.

- **Transport** systems to shift from a road to rail emphasis, with greater investment in public transport and more control on the use of private cars.

  The region is experiencing rapid motorization. Car-centred transport systems leads to hidden costs, such as chronic congestion, energy consumption, carbon emissions, air pollution and traffic accidents, which add up to more than 10 per cent of a country's GDP. A shift to sustainable mobility is urgently required.

- Existing **buildings** to be retrofitted to substantially improve their energy efficiency, and new building design to be based on green building standards.

  Buildings consume up to 40 per cent of energy. Improving the efficiency of buildings can reduce CO_2 emissions and the total amount of energy used.

- **Energy systems** to improve the efficiency fossil fuel consumption, expand the share of renewable energy sources and embrace next-generation technologies.

  In the Asia-Pacific region, 675 million people do not have access to modern energy services. Increasing the share of renewable energy through a decentralized and hybrid system and developing a low-carbon energy system can help respond to this demand – thus breaking down one of any society's great disparities.

- **Water** infrastructure to emphasize water-sensitive and low-impact development, based on decentralized water resource management and rainwater management.

  The per capita availability of water in the Asia-Pacific region is the second lowest in the world due to the population size but also as a result of misuse and overuse. If properly managed, a decentralized water resource management system can secure water resources, prevent urban flooding and restore the ecosystem.

- **Waste** to be turned from a cost (burden) into a resource and waste management must prioritize treatment at the source and recycling.

  Rapid urbanization and economic growth has resulted in a corresponding growth of waste that municipalities are finding increasingly difficult to dispose and on which they spend the lion's share of their budget. Reducing the amount of waste that needs to be disposed at the landfill is crucial. Recovering resources from waste through recycling, composting and turning waste into energy can solve the waste challenge while generating revenue and jobs.

TRACK 4: Turning green into a business opportunity

Greening the economy will require new and upgraded infrastructure, greening current industries and creating new ones as well as new and better goods and services. Businesses stand to gain from this transition. But governments have to create the enabling conditions for businesses to thrive in a green economy.

Governments need to bridge the gap between short-term costs and long-terms benefits and reduce uncertainty and risk for investors. Governments need to create a market for environmental goods and services.

This will require a mix of regulatory, economic, fiscal and information instruments, in particular: allowing market prices to reflect the real cost of energy and natural resources; using public finances strategically to leverage private investment; greening public procurement practices; supporting R&D; promoting transparency (through environmental reporting) and consumer awareness (through eco-labelling) as well as setting predictable long-term and transparent regulation (greenhouse gas emissions targets) and giving businesses enough time to adjust.

Turning green into a business opportunity should follow a three-pronged strategy:

- **Greening existing industries:** This entails encouraging industries to use resources more efficiently, phasing out toxic substances, substituting fossil fuels with renewable energy sources, improving occupational health and safety conditions, taking increased producer responsibility and reducing the overall risks for the environment. It also requires governments to promote cleaner production, industrial symbiosis and the 3R (reduce, reuse, recycle) approach.

- **Promoting new green products and services:** Green growth provides an opportunity for new industries to emerge. Enhancing energy systems, for example, provides an opportunity to develop the renewable energy industry as well as next-generation technologies, such as smart grids. The spread of these technologies can create a market for other goods, such as smart meters and smart appliances. A push towards sustainable mobility also provides an opportunity to develop industries around new technologies, such as electric vehicles. Greening the economy will require new services. A drive towards energy efficiency, for example, can provide opportunities for energy service companies (ESCOs).

- **Turning natural capital into a business opportunity:** Preserving ecosystems and investing in natural capital provide new space to generate profit and employment. National parks kept for biodiversity conservation and traditional culture can attract international tourists interested in ecotourism. Suncheon, Republic of Korea, for example, managed to attract more than three million visitors a year and economic benefits amounting to US$89 million by turning its wetlands into an ecotourism attraction. Additionally, sustainable agriculture practices, such as organic agriculture, marry the need for preserving ecological integrity with the need for profit.

TRACK 5: Formulating and implementing low-carbon development strategies

Governments in the region realize the importance of addressing climate change. At the same time, there is an urgent need to sustain economic growth to meet pressing socio-economic development goals and improve living standards.

Low carbon green growth is about harmonizing environmental protection and economic growth and using climate action to drive economic growth. This requires mainstreaming climate change mitigation and adaptation into the national development planning process.

More and more countries are aligning climate change and development priorities through a more integrated, comprehensive, consistent and coordinated approach through the planning and implementation of low-carbon development strategies.

The medium to long term targets and goals of the strategy provide clear signals to the private sector and the public on the direction for future investments, research and development for technology innovation and infrastructure development which can generate various growth opportunities. National greenhouse gas inventories need to be established and strengthened as an essential tool to support the planning process, as well as to track emission trends and their reduction.

Low-carbon development strategies can also provide the basis for planning, developing and implementing nationally appropriate mitigation actions (NAMAs). NAMAs allow developing countries to be recognized internationally for their voluntary actions that are based on their country context and can provide opportunities for attracting financing and technology transfer. Towards this end, a system for measurement, reporting and verification needs to be introduced to monitor emissions and reductions and promote transparency of financial flows and the deployment of technological support that are provided to a specific NAMA.

Putting a price on carbon, through a carbon tax and cap-and-trade schemes, is crucial for reducing carbon emissions, decreasing carbon intensity and stimulating green growth and should be the cornerstone of any low-carbon development strategy.

In addition, the promotion of eco-efficient infrastructure development to reduce the carbon intensity of economic growth patterns and active engagement of the public to pursue low carbon lifestyles should be an integral part of the strategy.

Lastly, low carbon development strategies will require engagement across ministries and sectors, backed by political commitment at the highest level.


CO2


Change
Just Ahead


Threat
Opportunity

Means of implementation:
Mobilizing finance, technology and capacity building

Changing market prices to reflect the social and environmental cost of resource consumption, coupled with supportive regulation, will allow private investment and technologies to flow into eco-efficient solutions. Introducing the system change required for low carbon green growth and pursuing the five tracks presented in this Roadmap will require, however, the mobilizing of needed financial resources, putting in place policies to stimulate R&D and ensuring that needed capacities are developed.

Financing

Public financing will be instrumental in jump-starting green growth. It is important that a sufficient amount of public funds be directed to catalyse the transition. Government funds also can be used to leverage private funds. Public financing mechanisms can tilt the balance in favour of profitability where the returns on investment for environmentally sustainable projects are currently low.

Carbon finance and mechanisms for payment for ecosystem services (PES) also have a place in financing low-carbon development and investments in natural capital.

Overseas development assistance (ODA), however, remains a critical source of funding for countries with special needs, such as least developed countries, landlocked developing countries and small island developing states, and its role in the transition to a green economy cannot be stressed enough.

Technology

Achieving environmental sustainability will require changes in public policy, business strategies and personal behaviours. It will also require better technologies. Green technologies will not just improve the economic, social and ecological qualities of economic growth – they will help drive growth.

Although most technology transfer is currently the domain of the private sector, the public sector will need to presume a more proactive influence with green growth. Publicly funded research leads to considerable economic benefits, both direct and indirect – as the green revolution can attest. At present, however, R&D on green technologies in many countries in the Asia-Pacific region is still at relatively low levels. If the region is to make faster progress the more industrialized countries will need to increase their investment.

Many countries in the region will also require assistance in the diffusion of clean energy technologies and should be able to rely on greater bilateral, regional and international cooperation.

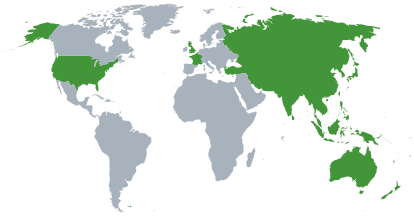
Capacity building

The transition to a green and low-carbon economy will also need to be accompanied with policies and programmes for building up the required capacities at different levels. First is the need to build the institutional skills and other capacities at different levels of government to generate and enforce the required policies. Second is the need to build the capacity of enterprises, especially small and medium-sized enterprises, to use new and existing knowledge to green their operations and to take advantage of business opportunities in a green economy. And third is the need to build up the skills of the workforce to engage in green and low-carbon economic activities.

Bilateral, regional and international cooperation is required to support capacity building in developing countries, especially those with special needs.

The Asia-Pacific region has come to a historical crossroad: development goals are within reach and the region has the opportunity to lift its people out of poverty. But arriving at those goals and pulling millions more people out of poverty cannot be done through conventional growth strategies. Resource constraints, price volatility and the climate crisis have removed business as usual as an option for all economies. The situation now requires a serious re-examination of the resource- and carbon-intensive growth strategies. Every country in the Asia-Pacific region needs to drastically improve its resource efficiency. The region must embrace a new growth strategy that can turn the trade-off between economic development and environmental protection into a win-win synergy in which "going green" drives economic growth.

The ***Low Carbon Green Growth Roadmap for Asia and the Pacific*** explores the opportunities that a low carbon green growth path offers to the region. It articulates five tracks on which to drive the economic system change necessary to pursue low carbon green growth as a new economic development path. In particular, the "visible structure" of the economy, comprising such physical infrastructure as transport, buildings and energy systems, together with the "invisible structure", which encompasses market prices, governance, regulations and lifestyles, have to be re-oriented towards resource efficiency. The Roadmap provides policymakers in the region with a comprehensive list of policy options and practical implementing strategies as well as examples of successful practices, woven through more than 100 fact sheets and case studies.



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