

Climate Change and Sustainable Development

08 CHAPTER

The year 2015 witnessed two landmark international events: the historic climate change agreement under the UNFCCC in Paris in December 2015 and the adoption of the Sustainable Development Goals in September 2015. The Paris Agreement aims at keeping the rise in global temperatures well below 2°C, which will set the world towards a low carbon, resilient and sustainable future, while the Sustainable Development Goals, which replace the Millennium Development Goals, set the development agenda for the next fifteen years. On the domestic front too some important climate-related initiatives were taken, including the launching of the historic International Solar Alliance and the submission of the ambitious Intended Nationally Determined Contribution.

INTRODUCTION

8.2 The adoption of a new climate change agreement at the 21st Conference of Parties (COP 21) by 195 nations in Paris in December 2015 represents another milestone in the climate change front. The Paris Agreement sets a roadmap for all nations in the world to take actions against climate change in the post-2020 period. It seeks to enhance global action against climate change and limit global warming while reflecting the principles of equity and common but differentiated responsibilities and respective capabilities (CBDR-RC), in the light of different national circumstances. An important feature of this new agreement is that it seeks to elicit ambitious action by each country by basing it on a country-driven approach with the contribution by each country to the global fight against climate change determined at national level.

8.3 The Millennium Development Goals (MDG) that were in place from 2000 to

2015 were replaced by the Sustainable Development Goals (SDG) with the aim of guiding the international community and national governments on a pathway towards sustainable development for the next fifteen years. A new set of 17 SDGs and 169 targets were adopted by the world governments in 2015.

8.4 On the domestic front, India continued to take ambitious targets in its actions against climate change. As a part of its contributions to the global climate change mitigation efforts, India announced its intended nationally determined contribution (INDC) which set ambitious targets for domestic efforts against climate change. Including other efforts, the country has set itself an ambitious target of reducing its emissions intensity of its gross domestic product (GDP) by 33-35 per cent by 2030, compared to 2005 levels, and of achieving 40 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030.

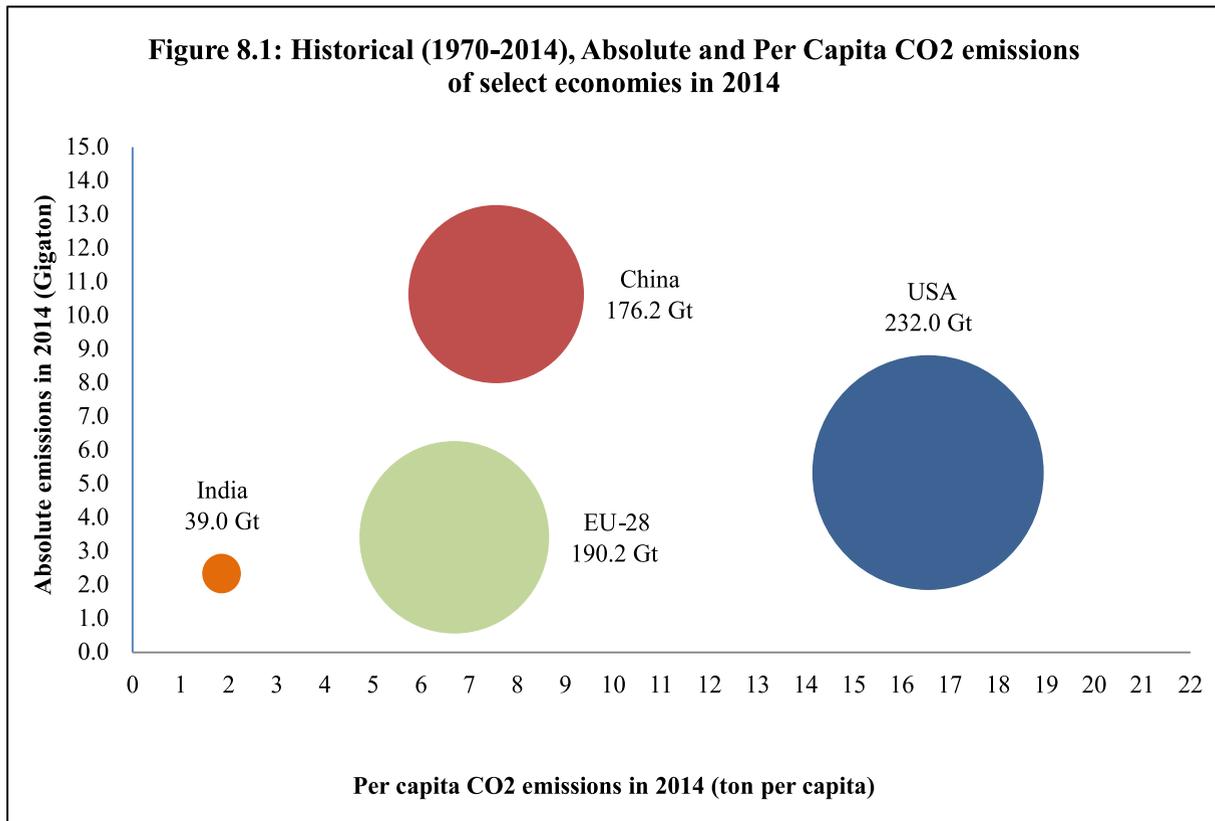
CLIMATE CHANGE

Emissions from major countries

8.5 According to the World Meteorological Organization, 2015 was the warmest year, with temperature 1°C above the pre-industrial era. This was owing to El Nino and warming caused by greenhouse gases (GHG). Anthropogenic emissions have been increasing at an unprecedented rate since the industrial revolution. According to an International Energy Agency (IEA) report (2015), concentration of CO₂ in 2014 was 40 per cent higher than in the mid-1800s. The energy sector is the largest contributor to GHG emissions and, within this, CO₂ emissions from combustion of fuels have the largest share. The global emissions profile shows that emissions have been distributed very unequally among different countries.

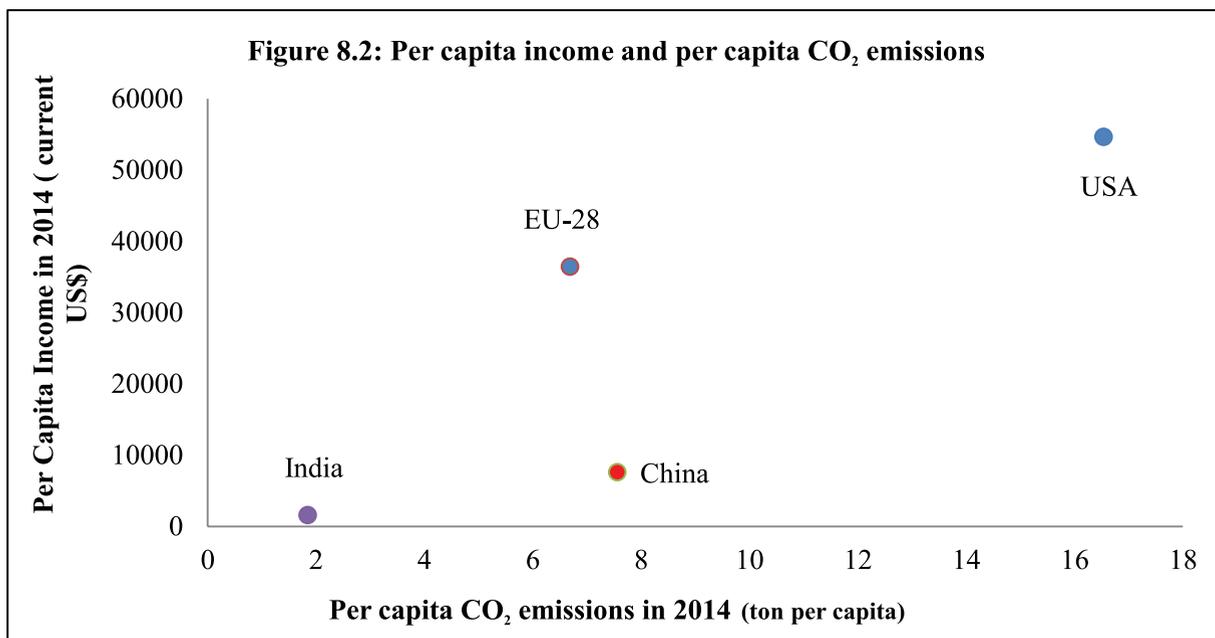
If historical CO₂ emissions from 1970 to 2014 are considered, India with 39.0 Gt is way behind the top three emitters – the USA, the EU and China. The USA's emissions, for example, were around six times India's. Even if historical levels are discounted and only present levels considered, both in terms of absolute and per capita emissions, India is way behind the three major CO₂ emitters (Figure 8.1). In 2014, in terms of absolute emissions, China was at the top, while in terms of per capita emissions, the USA was at the top. India's per capita emissions are among the lowest in the world.

8.6 If the different levels of development and differentiated responsibilities and equity are considered, the USA has the highest per capita CO₂ emissions and per capita income while India has the lowest of both among the four (Figure 8.2).



Note: Width of the bubbles indicates the total emissions between 1970 and 2014 for the respective countries and have been indicated beside the bubbles.

Source: Based on PBL Netherlands Environmental Assessment Agency data used in 'Trends in Global CO₂ Emissions 2015 Report'.

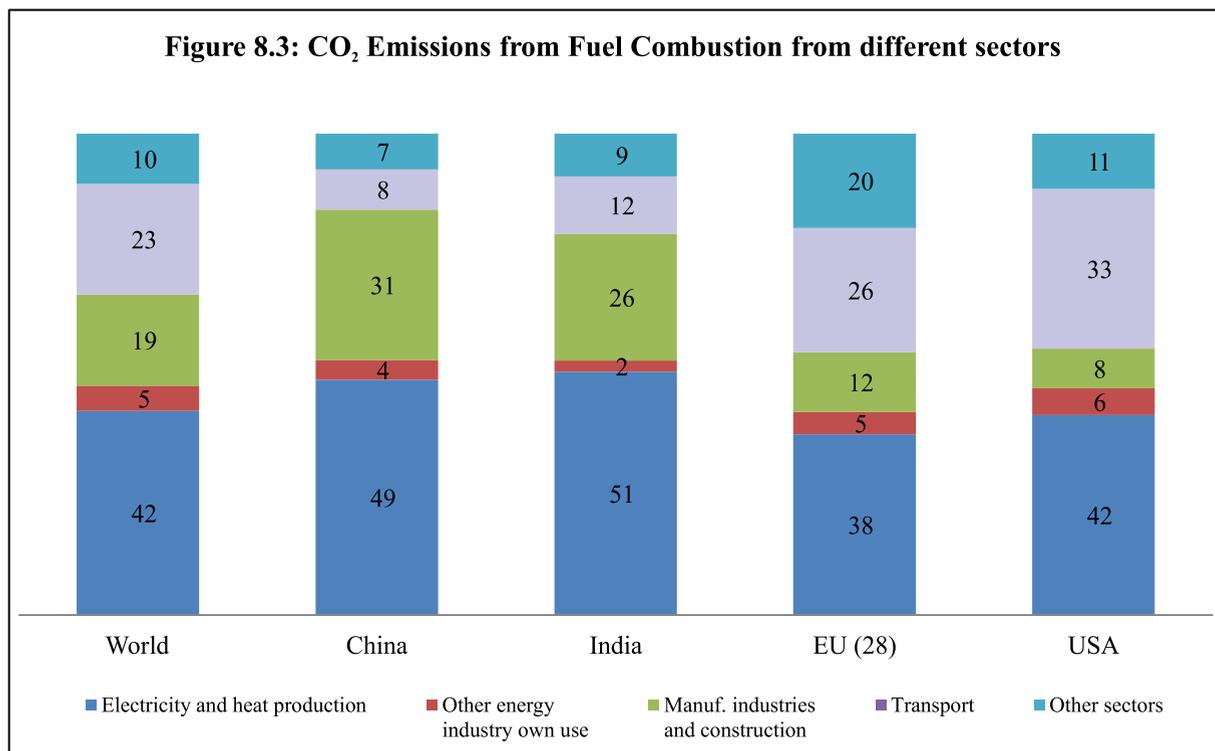


Source: Based on PBL Netherlands Environmental Assessment Agency data used in ‘Trends in Global CO₂ Emissions 2015 Report’ and World Bank Data.

Sector-wise emissions

8.7 In terms of sectoral CO₂ emissions from fuel combustion, electricity and heat production was the largest contributor for China, India, the EU and the USA, more

so for China and India, followed by the manufacturing industry for India and China and the transport sector for the US and the EU (Figure 8.3). These compositional patterns reflect the different priorities of these countries.



Source: Based on data from IEA CO₂ Emissions from Fuel Combustion, OECD/IEA, Paris, 2015.

PARIS AGREEMENT

8.8 The 21st Conference of Parties (COP 21) under the United Nations Framework Convention on Climate Change (UNFCCC) successfully concluded in Paris after intense negotiations by the Parties followed by the adoption of the Paris Agreement on post-2020 actions on climate change. This universal agreement will succeed the Kyoto Protocol. Unlike the Kyoto Protocol, it provides a framework for all countries to take action against climate change. Placing emphasis on concepts like climate justice and sustainable lifestyles, the Paris Agreement for the first time brings together all nations for a common cause under the UNFCCC. One of the main focus of the agreement is to hold the increase in the global average temperature to well below 2°C above pre- industrial level and on driving efforts to limit it even further to 1.5°C. The Paris Agreement comprises of 29 articles

and is supported by 139 decisions of the COP. It covers all the crucial areas identified as essential for a comprehensive and balanced agreement, including mitigation, adaptation, loss and damage, finance, technology development and transfer, capacity building and transparency of action and support (Box 8.1).

8.9 A marked departure from the past is the Agreement's bottom-up approach, allowing each nation to submit its own national plan for reducing greenhouse gas emissions, rather than trying to repeat a top-down approach advocated by the Kyoto Protocol, giving each country an emission reduction target.

Key Provisions of the Paris Agreement

8.10 **CBDR-RC:** The principle of CBDR-RC has been maintained across all the important pillars of the agreement (mitigation, adaptation, finance, technology

Box 8.1: Salient features of the Paris Agreement

- The Paris Agreement acknowledges the development imperatives of developing countries by recognizing their right to development and their efforts to harmonize it with the environment, while protecting the interests of the most vulnerable.
- The Agreement seeks to enhance the 'implementation of the Convention' while reflecting the principles of equity and CBDR-RC, in the light of different national circumstances.
- Countries are required to communicate to the UNFCCC climate action plans known as nationally determined contributions (NDCs) every five years. Each Party's successive NDC will represent a progression beyond the Party's then current NDC thereby steadily increasing global effort and ambition in the long term.
- The Agreement is not mitigation-centric and includes other important elements such as adaptation, loss and damage, finance, technology development and transfer, capacity building and transparency of action and support.
- Climate action will also be taken forward in the period before 2020. Developed countries are urged to scale up their level of financial support with a complete road map towards achieving the goal of jointly providing US\$ 100 billion by 2020. At the same time, a new collective quantified goal based on US\$ 100 billion floor will be set before 2025.
- The Agreement mandates that developed countries provide financial resources to developing countries. Other Parties may also contribute, but on a purely voluntary basis.
- Developed countries are urged to take the lead in mobilization of climate finance, while noting the significant role of public funds in the mobilization of finance which should represent a progression beyond their previous effort.
- The Agreement includes a robust transparency framework for both action and support.
- Starting in 2023, a global stocktake covering all elements will take place every five years to assess the collective progress towards achieving the purpose of the Paris Agreement and its long term goals.
- The Paris Agreement establishes a compliance mechanism, overseen by a committee of experts that operates in a non-punitive way, and is facilitative in nature.

development and transfer, capacity building and transparency of action and support). This was one of the contentious issues between developed and developing countries during the negotiations, with developed countries arguing that the world has changed since 1990 and fast-growing economies like India and China should also take deeper emission cuts despite the fact that they have historically contributed less to the global emission of greenhouse gases.

8.11 NDCs: The Paris Agreement invites Parties to submit their first nationally determined contributions prior to the submission of their instruments of ratification, accession, or approval of the Agreement. However, this requirement stands satisfied if a Party has already communicated its INDC prior to joining the Agreement. The Parties whose intended nationally determined contributions have a time frame up to 2025-2030 are required to communicate or update these contributions by 2020 and to do so every five years thereafter. Each Party's successive nationally determined contribution will represent a progression beyond the Party's then current nationally determined contribution. It also recognizes the need to support developing country Parties for the effective implementation of the agreement. NDCs may also include quantifiable information, time frames for implementation, scope and coverage, planning processes, assumptions and methodological approaches, including those for estimating and accounting for anthropogenic greenhouse gases.

8.12 Mitigation: To achieve the long-term temperature goal of holding temperature increase to below 2°C, in the context of sustainable development and efforts to eradicate poverty, Parties in the Agreement aim to reach global peaking of greenhouse gas emissions as soon as possible. The Paris Agreement operationalizes differentiation between developed and developing countries mitigation actions through three main

elements, namely, (a) by acknowledging that peaking of emission in developing countries will take longer; (b) by calling upon developed countries to take the lead in mitigation actions; and (c) by calling upon support to be provided to developing countries for implementation of climate change actions, recognizing that enhanced support will allow for higher ambition in their action.

8.13 Adaptation: Given the trends in global warming, even if the temperature rise is restricted to below 2°C, adaptation support would be required for developing countries like India. The agreement establishes the global goal on adaptation – of enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change – with a view to contributing to sustainable development and ensuring an adequate adaptation response in the context of the 2°C goal. Countries are required to update periodically their adaptation communication, but are given flexibility on the timing and method of communication.

8.14 Finance: The agreement sets a binding obligation on developed countries to provide financial resources to developing countries for both mitigation and adaptation while encouraging other countries to provide support on a voluntary basis. It reaffirms that developed countries will take the lead in mobilizing climate finance from a wide variety of sources, instruments and channels, noting the significant role of public funds. The decision also sets a new collective quantified goal from a floor of US\$ 100 billion per year prior to 2025, taking into account the needs and priorities of developing countries.

8.15 The agreement marks a step forward in terms of providing transparent and consistent information on support provided and mobilized by developed countries to developing countries. Though the modalities and procedure for reporting such information would be decided at a later stage, this could

help in avoiding double counting in terms of mobilized finance.

8.16 Technology Development and Transfer: The Paris Agreement contains strengthened provision on technology development and transfer with a new technology framework being established.

8.17 In addition, there is now a link established between the Technology Mechanism and the Financial Mechanism to allow for collaborative approaches in Research and Development (R&D), and for facilitating access to technologies. This reflects the concern of developing countries to ensure provision of financial resources to facilitate access to technologies.

8.18 The emphasis on R&D and innovation in the Paris Agreement is a critical step in furthering the implementation of the provisions of the Convention. Similarly, the technology framework providing guidance to the Technology Mechanism (which comprises of the Technology Executive Committee and the Climate Technology Centre and Network) in promoting and facilitating enhanced action on technology development and transfer is a step forward.

8.19 Transparency: The transparency mechanism of action and support under the UNFCCC was differentiated for developed and developing countries. The information provided by the developed countries in their National Communications, Biennial Reports (BR), etc. is subject to international assessment and review (IAR) while that provided by developing countries in their National Communications and Biennial Update Reports (BUR) is subject to international consultation and analysis (ICA). As per the Paris Agreement now, the Transparency Framework will build on and enhance the arrangements under the UNFCCC, and the information provided by all countries will be subject to technical expert review. However, the review process

will give due consideration to the respective national capabilities and circumstances of developing countries. Countries will be required to report on their anthropogenic emissions by sources and removals by sinks of greenhouse gases, and regularly track progress on achieving their NDCs.

8.20 Global stocktake: The agreement also establishes a framework for global stocktake to assess the collective action towards achieving the long-term goals mentioned in the Agreement. This stocktake would be an assessment of the aggregate level of ambition communicated through the NDCs in relation to the level needed, while considering mitigation, adaptation and the means of implementation and support, and in the light of equity. The first stocktake is slated for 2023.

8.21 The Paris Agreement also clearly states in its decision that it is under the aegis of the UNFCCC and will come into force only when at least 55 Parties to the Convention, accounting for at least an estimated 55 percent of total global greenhouse gas emissions, have deposited their instruments of ratification, acceptance, approval or accession. A new Ad Hoc Working Group on the Paris Agreement (APA) has also been set up to work on issues requiring further rules or guidance, including preparing for entry into force of the Agreement and the first session of the Conference of Parties serving as the Meeting of Parties to the Agreement.

8.22 Going forward, there is a clear direction and positives for clean energy sectors, energy efficiency and green finance (Box 8.2). Focus on renewable energy sectors like solar and wind energy can send strong market signals for technology development, particularly clean technology. However, there could be pressure on emerging economies to announce a peaking year of their emission in the future. The new transparency framework calling for regular reporting is an added obligation.

Box 8.2: Green Finance

The term green finance has gained a lot of attention in the past few years with the increased focus on green development. The Rio+20 document clearly states what green economy policies should result in and what they should not. While there is no universal definition of green finance, it mostly refers to financial investments flowing towards sustainable development projects and initiatives that encourage the development of a more sustainable economy (Höhne et al. 2012). Green finance includes different elements like greening the banking system, the bond market and institutional investment. Several working definitions and sets of criteria of green finance have also been developed. Examples include the China's Green Credit Guidelines, the Climate Bonds Taxonomy of Green Bonds, the International Development Finance Club's (IDFC) approach to reporting on green investment, the World Bank/International Finance Corporation's (IFC) Sustainability Framework and the UK Green Investment Bank Policies. An initial review of the current definitions in use reveals sizeable intersections of the various definitions in thematic areas such as clean energy, energy efficiency, green buildings, sustainable transport, water and waste management, as well as areas of controversy such as nuclear and large-scale hydro energy, biofuels and efficiency gains in conventional power.

Over the past decade there have been advances in mainstreaming of green finance within financial institutions and financial markets. Voluntary standards such as the Equator Principles have enhanced environmental risk management for many financial institutions. The World Bank Group has set up an informal "Sustainable Banking Network" of banking regulators, led by developing countries, to promote sustainable lending practices. In 2015, green bonds issued by governments, banks, corporates and individual projects amounted to US\$42 billion. Globally, more than 20 stock exchanges have issued guidelines on environmental disclosure, and many green indices and green ETFs (exchange-traded funds) have been developed. The Financial Stability Board (FSB) has established a climate-related financial disclosures task force that is expected to complete its first stage of the work by end-March 2016. A growing number of institutions, including the Bank of England and Bank of China (Industrial and Commercial Bank of China), have begun to assess the financial impact of climate and environmental policy changes. Germany, the US and the UK have developed interest subsidy and guarantee programmes for green financing, and over a dozen government-backed green investment banks are operating globally. The G-20 has also recently set up a green finance study group (GFSG).

One topical issue in the context of green finance is that of enhancing the ability of the financial system to mobilize private green finance, thereby facilitating the green transformation of the global economy which has been widely discussed in different fora including the G20. However, for developing countries like India, private finance will not readily be forthcoming and public finance both international and domestic needs to be used to leverage private finance.

Green development is also important for India though green finance is yet to pick up. Attaining the ambitious solar energy target, development of solar cities, setting up wind power projects, developing smart cities, providing infrastructure which is considered as a green activity and the sanitation drive under the 'Clean India' or 'Swach Bharath Abhiyan' are all activities needing green finance. India has created a corpus called the National Clean Energy Fund (NCEF) in 2010-11 out of the cess on coal produced/imported ('polluter pays' principle) for the purpose of financing and promoting clean energy initiatives and funding research in the area of clean energy. Some of the projects financed by this fund include innovative schemes like a green energy corridor for boosting the transmission sector, the Jawaharlal Nehru National Solar Mission's (JNNSM) installation of solar photovoltaic (SPV) lights and small capacity lights, installation of SPV water pumping systems, SPV power plants, grid-connected rooftop SPV power plants and a pilot project to assess wind power potential.

So far four banks have issued green bonds in India. Proceeds from these bonds are mostly used for funding renewable energy projects such as solar, wind and biomass projects and other infrastructure sectors, with infrastructure and energy efficiency being considered as green in their entirety. The Securities and Exchange Board of India (SEBI) has also recently approved the guidelines for green bonds.

While mobilization and effective use of green finance is of primary importance, there are some issues which need to be taken note of.

- For a developing country like India, poverty alleviation and development are of vital importance and resources should not be diverted from meeting these development needs. Green finance should not be limited only to investment in renewable energy, as, for a country like India, coal based power accounts for around 60 per cent of installed capacity. Emphasis should be on greening coal technology. In fact, green finance

for development and transfer of green technology is important as most green technologies in developed countries are in the private domain and are subject to intellectual property rights (IPR), making them cost prohibitive.

- Green bonds are perceived as new and attach higher risk and their tenure is also shorter. There is a need to reduce risks to make them investment grade.
- There is also a need for an internationally agreed upon definition of green financing as its absence could lead to over-accounting.
- While environmental risk assessment is important, banks should not overestimate risks while providing green finance.
- Green finance should also consider unsustainable patterns of consumption as a parameter in deciding finance, particularly conspicuous consumption and unsustainable lifestyles in developed countries.

Source: Based on G20's GFSG backgrounder and internal study.

Reference: Höhne / Khosla / Fekete / Gilbert (2012): Mapping of Green Finance Delivered by IDFC Members in 2011, Ecofys.

INTENDED NATIONALLY DETERMINED CONTRIBUTION (INDC)

8.23 INDCs are plans by governments communicated to the UNFCCC regarding the steps they will take to address climate change domestically. As per the COP 19 decision (Warsaw 2013), all Parties were requested to prepare their INDCs, without prejudice to the legal nature of the contributions towards achieving the objectives of Article 2 of the Convention and communicate them well in advance of COP 21. Accordingly, India submitted its INDC to the UNFCCC on 2 October 2015 (Box 8.3).

8.24 India's INDC is comprehensive and covers all elements, i.e. adaptation, mitigation, finance, technology and capacity building. India's goal is to reduce the overall emission intensity and improve the energy efficiency of its economy over time. It also covers concerns to protect the vulnerable sectors and segments of its society. The principle of equity and CBDR, historical responsibilities and India's development imperatives and enhanced adaptation requirements have been recurring themes in the INDC document.

8.25 India houses 30 per cent of the global poor, 24 per cent of global population without access to electricity, and 92 million people

Box 8.3: India's INDC: Climate Change Contributions

1. To put forward and further propagate a healthy and sustainable way of living based on traditions and values of conservation and moderation.
2. To adopt a climate friendly and cleaner path than the one hitherto followed by others at a corresponding level of economic development.
3. To reduce the emissions intensity of its GDP by 33 to 35 per cent of the 2005 level by 2030.
4. To achieve about 40 per cent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030 with the help of transfer of technology and low cost international finance including from the Green Climate Fund (GCF).
5. To create an additional carbon sink of 2.5 to 3 billion tonnes of CO₂ equivalent (CO₂eq.) through additional forest and tree cover by 2030.
6. To better adapt to climate change by enhancing investments in development programmes in sectors vulnerable to climate change, particularly agriculture, water resources, the Himalayan region, coastal regions, health and disaster management.
7. To mobilize domestic and new and additional funds from developed countries for implementing these mitigation and adaptation actions in view of the resources required and the resource gap.
8. To build capacities, create a domestic framework and an international architecture for quick diffusion of cutting-edge climate technology in India and for joint collaborative R&D for such future technologies.

without access to safe drinking water. Coupled with its vulnerability in terms of the impact of climate change, this entails that India faces formidable and complex challenges in terms of balancing the sustainable development agenda. Given the challenges it faces, it has prepared an ambitious plan in terms of clean energy, energy efficiency and lower emission intensity while addressing the critical issue of poverty and food security.

8.26 India's INDC sets ambitious renewable energy targets mainly in terms of solar and wind energy. With a potential of more than 100 GW, the target is to achieve 60 GW of wind power and 100 GW of solar power installed capacity by 2022. Given that in 2014 the world's entire installed solar power capacity was 181 GW, this target is extremely ambitious and clearly places India as a major potential renewable energy player (World Resource Institute, October 2015). India has also launched a historic International Solar Alliance (ISA) which is envisaged as a coalition of solar resource-rich countries to address their special energy needs and will provide a platform to collaborate on addressing the identified gaps through a common, agreed approach. Although there is lot of emphasis on boosting the renewable energy sector, the INDC clearly state that coal would continue to be the dominant source of power generation in the future. However, the INDC incorporates a lot of initiatives to improve the efficiency of coal-based power plants and to reduce their carbon footprint. Clean coal technologies would be critical to meeting the demand for power generation in the future.

8.27 In addition to mitigation-related activities, the INDC also incorporates adaptation-related activities. Out of the eight National Missions on Climate Change in India, five focus on adaptation in sectors like agriculture, water and forestry. The INDC also highlights India's major initiatives taken for rural livelihood security and disaster

management. India's INDC have been welcomed as fair and ambitious, specifically in the renewable energy and forestry sectors. However, the task is enormous as can be seen from a comparison on some actuals with the targets (Table 8.1).

Table 8.1: INDC Targets

	Current	INDC target
Wind power installed capacity	25.08 GW	60 GW by 2022
Solar power installed capacity	4.88 GW	100 GW by 2022

Source: Compiled from Ministry of New and Renewable Energy data and India's INDC.

8.28 Mobilizing finance is critical to achieving the ambitious targets set by India. Preliminary estimates suggest that at least US\$ 2.5 trillion at 2014-15 prices will be required for meeting India's climate change action under the INDC between now and 2030. While the maximum share of the country's current climate finance comes from budgetary sources, India is not relying solely on them and is experimenting with a careful mix of market mechanisms together with fiscal instruments and regulatory interventions. However, it needs to be emphasized that international finance is a critical enabler for the scaled up climate action plans.

International Assessment of INDCs

8.29 The 'Synthesis Report on the Aggregate Effect of the Intended Nationally Determined Contributions' (October 2015) of the UNFCCC, states that 119 INDCs were communicated by 147 Parties representing 86 per cent of global greenhouse gas emissions in 2010. Out of the 119 INDCs submitted, 100 had an adaptation component, which reflects the relevance of adaptation to all areas of social and economic activity and the strong interest of Parties in continuing to strengthen their adaptation efforts together with their mitigation ones. The INDCs of most countries are national in scope and can be implemented through their national action plan (NAP) and they cover a large number of sectors. In addition to adaptation, some of the

INDCs also have quantified loss and damage projections. Parties have also highlighted the crucial role of enhanced international support for implementing their INDCs.

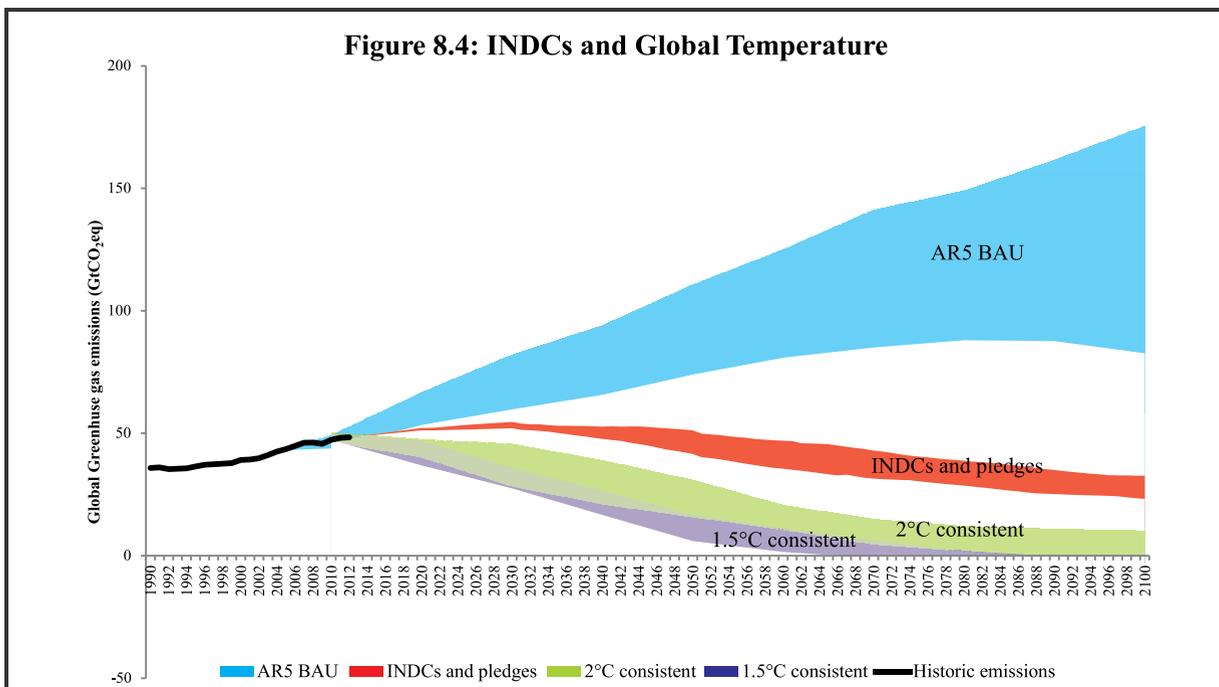
8.30 Further, the report states that the implementation of the communicated INDCs would result in aggregate global emission levels of 55.2 Gt CO₂ eq. in 2025 and 56.7 Gt CO₂ eq. in 2030. Global aggregate emission levels resulting from the implementation of INDCs do not fall within the 2°C scenarios by 2025 and 2030 and are expected to be higher by 34 - 46 per cent in 2025 and 37 - 52 per cent in 2030 in relation to the global emission level in 1990. However, as compared to the 1990 and 2010 levels, global average per capita emissions are expected to decline by 8 and 4 per cent by 2025 and by 9 and 5 per cent by 2030 respectively.

8.31 Figure 8.4 shows the impact of current pledges including those in the INDCs submitted by countries as well as other scenarios on the global greenhouse gas

emissions. As per the Climate Action Tracker Report, under the baseline scenario of the Intergovernmental Panel on Climate Change's (IPCC) Fifth Assessment Report (AR5) Working Group III, global rise in temperatures is expected to reach 4.1°C – 4.8°C above pre-industrial levels by the end of the century. Under the pledges and INDCs, it is likely to be limited to around 2.7°C above pre-industrial levels. Under the AR5 business as usual (BAU) scenario, greenhouse gas emissions are expected to be between 60 and 82 GtCO₂eq. in 2030 while with the implementation of the INDCs and pledges it is expected to lie between 52 and 55 GtCO₂eq. in 2030. The 2°C consistent emissions are much lower and lie between 28 and 45 GtCO₂eq. However, the amount of finance needed to achieve even the communicated INDCs would be huge.

TRACKING CLIMATE FINANCE

8.32 Policymakers around the world are alive to the compulsion of combating climate



Source: Climate Action Tracker Project. <http://climateactiontracker.org/global.html>

Note: AR5 BAU refers to the baseline scenario taken from IPCC AR5 Working Group III.

INDCs and pledges refers to the unconditional pledges or promises that governments have made including those in the submitted INDCs as of 7 December 2015.

change as unmitigated climate change risks pose irreversible costs. Complexity arises in the case of financing for addressing adaptation and mitigation of GHG emissions. Provision of finance is embedded in the convention and has also been mentioned in the Paris Agreement for addressing the adaptation and mitigation needs of developing countries. Equally important is the tracking of climate finance. Lack of a clear definition of climate finance has led to controversies in recent estimates of climate finance. The 'Climate Finance in 2013-14 and the US\$100 Billion Goal' report released by the Organisation for Economic Co-operation and Development (OECD) and Climate Policy Initiative states that the mobilization of climate finance from developed to developing countries had reached US\$62 billion in 2014. The report seems to include the full value of multilateral development bank (MDB) loans as well as official development assistance (ODA), some private finance, export credits, etc. as climate finance, leading to double counting. Also it includes the promises, pledges and multi-year commitments and not actual disbursements as climate finance. The decline in allocation of ODA to the least developed countries (LDC) in the past year, could perhaps be linked to higher allocation to 'climate-related objectives', implying that ODA is being diverted to climate-related activities.

8.33 The Paris Agreement mandates that transparent and consistent information on support provided and mobilized through public interventions for developing country Parties be provided by developed countries. However, it is silent on the definition of climate finance. While the question of what counts as climate finance would be decided at a later stage by the Standing Committee on Finance under the UNFCCC, it is important that it should highlight certain basic elements like sources of funding, terms of funding and purpose of funding in addition to resources being committed/disbursed/new. Moreover,

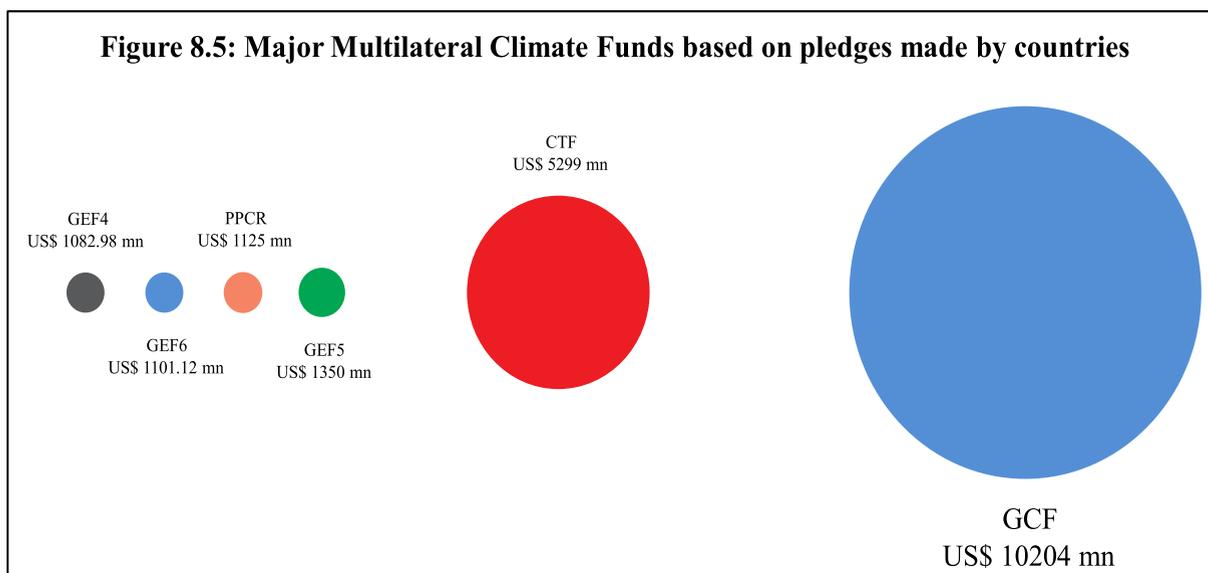
while defining climate finance, it is also important to define what cannot be counted towards climate finance. Aid money meant for development purpose should not be counted as climate finance. With reference to funds provided for multiple purposes, only the share provided solely for climate change should be included under climate finance. Also systems should be in place to check for double counting or treatment of ODA as climate finance. There is an even greater gap in tracking adaptation finance and segregating it from development funds as a whole; as a result, very often the entire amount allocated to a project is erroneously treated as adaptation finance. Any climate finance tracking exercise needs to carefully account for these problems.

MULTILATERAL CLIMATE FUNDS

8.34 International climate funds can either be multilateral or bilateral depending on the participating countries. Funds may further be classified according to their area of focus, namely mitigation, adaptation or REDD (reducing emissions from deforestation and forest degradation). Figure 8.5 shows some of the major multilateral climate funds in terms of their relative sizes according to the pledges made by different countries. Currently, the Green Climate Fund (GCF) is the largest, with pledges amounting to US\$10.2 billion. The second largest is the Clean Technology Fund (CTF) with pledges amounting to US\$5.3 billion. With the capitalization of the GCF and the sunset clause of the CTF, there is ambiguity about the role of the CTF in the climate finance architecture post-2020.

The GCF

8.35 The GCF was established as an operating entity of the financial mechanism of the UNFCCC in 2011 and is expected to be a major channel for climate finance from developed to developing countries. The GCF has so far been pledged US\$10.2 billion by 38 governments. These include some developing



Data source: Climate Funds Update website: climatefundsupdate.org. Status as of November, 2015.

Note: PPCR - Pilot Program for Climate Resilience

countries with small contributions. The highest contribution of US\$3 billion has been announced by the USA, followed by Japan (US\$1.5 billion), the UK (US\$1.2 billion), France (US\$1.03 billion) and Germany (US\$1.0 billion). Out of this total of US\$ 10.2 billion, only US\$ 5.9 billion has been converted into contribution agreements, with Japan, the UK, France and Germany fully signing the pledged amounts. Some countries including the USA are yet to sign the pledged amounts. The initial resource mobilization period extends from 2015 to 2018. At the 11th GCF board meeting (November 2015), the board approved commitment of US\$168 million to eight specific projects, subject to certain conditions being met by the project proponents. The board aims to approve US\$2.5 billion in commitments to additional projects in 2016.

Global Environment Facility

8.36 The Global Environment Facility (GEF) was established as a pilot programme for environmental protection. The current project cycle is GEF-6 over the years 2014-18. In 1992, when the Biodiversity and Climate Change Conventions were adopted at Rio de

Janeiro, the GEF was adopted as a financial mechanism for helping developing countries meet their financing needs for achieving their climate change goals. As of November 2015, the GEF has directly invested a total of US\$14.5 billion in 3946 projects in 167 countries, out of which US\$4.2 billion is in 1010 projects for climate change mitigation. Till date, India has received US\$516.6 million of GEF grant, of which US\$324.69 million is for climate change mitigation projects while US\$10 million is for climate change adaptation projects.

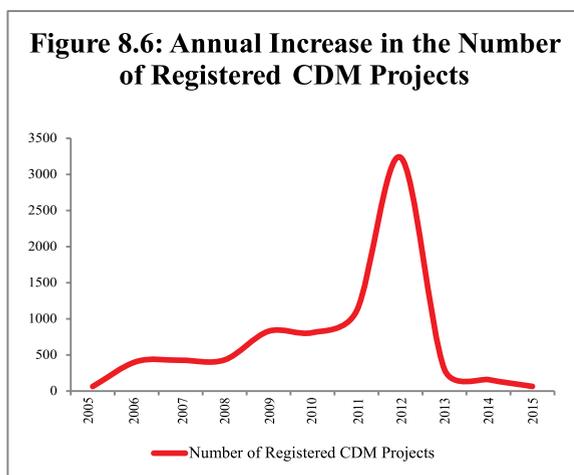
INTERNATIONAL CARBON MARKETS

8.37 The Clean Development Mechanism (CDM), created multilaterally under the UNFCCC is one of the mitigation instruments under the Kyoto Protocol. Lack of mitigation ambition in the pre-2020 period has slowed its momentum. Moreover, low ambition for emissions reductions expressed by developed countries under the Kyoto Protocol and some major players pulling out of Kyoto Protocol has further suppressed the demand for certified emissions reduction (CER) credits. At present, the CDM is facing its most severe crisis since it was set up a decade ago.

8.38 The CDM has witnessed a steady decline in the number of projects being registered since 2013 (Figure 8.6) owing to the crash in the price of CERs since 2012. In 2015 only 68 fresh CDM projects were registered and as on 31st January 2016, a total of 7691 projects were registered. Given that pre-2020 mitigation ambition is limited, the demand for CERs is expected to remain subdued. The potential supply of CERs till the end of 2020 is expected to be 7,758,428,513.

8.39 Analysis of the INDCs submitted to the UNFCCC reveals that many of the Parties to the Convention have shown interest in using market mechanisms or are positively inclined towards them. The Paris Agreement mentions voluntary cooperation among Parties through the use of internationally transferred mitigation outcomes. This indicates that market-based mechanisms are likely to be developed in the coming years to help Parties meet their post-2020 mitigation commitments. It remains to be seen whether the Kyoto flexibility mechanisms would be continued beyond 2020 or what form the mechanism takes.

8.40 In addition to the multilateral market-based mechanisms, many regional and national market mechanisms are under implementation. According to a World Bank Report (2015), around 40 countries



Source: UNEP Technical University of Denmark (DTU) Partnership CDM Pipeline analysis and database as of 1 January 2016.

and 20 regions around the world have regional carbon-pricing instruments under implementation. These represent about one-fourth of global greenhouse gas emissions. These instruments are either in the form of a carbon tax or an emissions trading scheme. There are at least 19 major emissions-trading schemes under implementation at national and regional levels across the world. The major regional emissions-trading scheme currently under implementation is the European Union Emission Trading System (EU ETS). The EU ETS covers 28 EU countries as well as Iceland, Liechtenstein and Norway.

CDM projects in India

8.41 As on 4 January 2016, 1593 out of a total of 7685 projects registered by the CDM executive board are from India, which so far is the second highest in the world with China taking the lead with 3764 projects registered. Indian projects have been issued 191 million CERs, 13.27 per cent of the total number of CERs issued. These projects are in the energy efficiency, fuel switching, industrial processes, municipal solid waste, renewable energy and forestry sectors and are spread across the country. About 90-95 per cent of the CDM projects are being developed by the private sector, facilitating investments of about ₹583,751 crore (US\$ 87.77 billion) in the country, which is more than the total of multilateral grants available for climate change related activities.

DOMESTIC ACTIONS ON CLIMATE CHANGE

National Action Plan on Climate Change

8.42 A major component of India's domestic actions against climate change is the National Action Plan on Climate Change (NAPCC). The Prime Minister's Council on Climate Change (PMCCC) has directed the missions under the NAPCC to enhance their ambition in respect of adaptation, mitigation and capacity building and reprioritize them, besides recommending the setting up of some new missions in addition to the existing

eight. Considering the adverse impacts that climate change could have on health, a new Mission on Climate Change and Health is currently under formulation and a National Expert Group on Climate Change and Health has been constituted. The proposed waste-to-energy mission will incentivize efforts towards harnessing energy from waste and is aimed at lowering India's dependence on coal, oil and gas for power production. The National Mission on Coastal Areas (NMCA) will prepare an integrated coastal resource management plan and map vulnerabilities along the entire (nearly 7000-km-long) shoreline. The Ministry of Earth Sciences will provide it scientific and technical advice and the Ministry of Environment, Forest and Climate Change (MoEF&CC) will manage and implement the NMCA.

State Action Plans on Climate Change

8.43 The State Action Plans on Climate Change (SAPCC) aim to create institutional capacities and implement sectoral activities to address climate change. These plans are focused on adaptation with mitigation as co-benefit in sectors such as water, agriculture, tourism, forestry, transport, habitat and energy. So far, 28 states and 5 union territories (UTs) have submitted their SAPCCs to the MoEF&CC. Out of these, the SAPCCs of 32 states and UTs have been endorsed by the National Steering Committee on Climate Change (NSCCC) at the MoEF&CC.

National Adaptation Fund for Climate Change

8.44 A National Adaptation Fund for Climate Change (NAFCC) has been established with a budget provision of ₹350 crore for the year 2015-2016 and 2016-2017. It is meant to assist in meeting the cost of national- and state-level adaptation measures in areas that are particularly vulnerable to the adverse effects of climate change. The overall aim of the fund is to support concrete adaptation activities that reduce

the adverse effects of climate change facing communities, sectors and states but are not covered under the ongoing schemes of state and central governments. The adaptation projects contribute towards reducing the risk of vulnerability at community and sector level. Till date, the NSCCC has approved six detailed project reports (DPR), amounting to a total cost of ₹117.98 crore, submitted by Punjab, Odisha, Himachal Pradesh, Manipur, Tamil Nadu and Kerala.

Coal Cess and the National Clean Energy Fund

8.45 India is one of the few countries around the world to have a carbon tax in the form of a cess on coal. Not only has India imposed such a cess but it has also been progressively increasing it. The coal cess which was fixed at ₹50.00 per tonne of coal since 22 June 2010 and increased to ₹100.00 per tonne of coal in Budget 2014-15, was further doubled to ₹ 200.00 per tonne in the 2015-16 Budget.

8.46 The National Clean Energy Fund (NCEF) which is supported by the cess on coal was created for the purposes of financing and promoting clean energy initiatives, funding research in the area of clean energy and for any other related activities. Till date 56 projects have been recommended by the inter ministerial group (IMG) with total viability gap funding (VGF) of ₹34,784.09 crore spread over several years. For 2015-16, ₹4700 crore has been allocated in the Budget for NCEF projects. VGF is also being provided for Namami Gange or the Integrated Ganga Conservation Mission.

Perform Achieve and Trade

8.47 The Perform Achieve and Trade (PAT) scheme under the National Mission on Enhanced Energy Efficiency was introduced as an instrument for reducing specific energy consumption in energy-intensive industries with a market-based mechanism that allowed the trading of ESCerts (energy saving

certificate). The first PAT cycle which ended on 31 March 2015 included 478 industrial units in eight sectors. The monitoring and verification phase lasted from 1 April 2015 to 14 August 2015. The verification of the performance of designated consumers (DC) was carried out by accredited energy auditing firms. Currently, scrutiny of performance assessment documents by state designated agencies and by the Bureau of Energy Efficiency (BEE) is under process. After the scrutiny, on the recommendations of the BEE, the central government will issue ESCerts which will be traded through power exchanges. The activities for PAT cycle II such as deepening, that is including more designated consumers from the existing sectors, and widening, that is including more sectors, have already started.

Progress on the Renewable Energy Front in India

8.48 Renewable energy has become a major focus area of the government with the ambitious target of achieving 40 per cent cumulative electric capacity from non-fossil fuel-based energy resources by 2030. India is currently undertaking the largest renewable capacity expansion programme in the world. The total renewable energy capacity target has been increased to 175GW by the year 2022, out of which 100GW is to be from solar, 60 GW from wind, 10 GW from biomass and 5 GW from small hydro power projects.

8.49 The First Renewable Energy Global Investment Promotion Meet and Expo (RE-INVEST) were organized in February 2015 to provide a platform for the global investment community to connect with stakeholders in India. The objective of the RE-INVEST series of conference expos is to showcase India's renewable energy potential and the government's efforts to develop and scale up the country's installed renewable energy capacity to meet the national energy requirement in a socially,

economically and ecologically sustainable manner. The event has attracted participation from 118 exhibitors, 200 global investors and financiers, 202 speakers and 2500 delegates from 32 countries. A total of 273,000 MW green commitments, including 62,000 MW of renewable manufacturing, were received in the event.

8.50 The Indian Prime Minister launched the ISA at COP 21 in Paris on 30 November 2015. The ISA will provide a special platform for mutual cooperation among 121 solar-resource-rich countries lying fully or partially between the Tropic of Cancer and Tropic of Capricorn. The Secretariat of the ISA will be hosted by India. Another ambitious programme of the government is the Development of Solar Cities Programme under which 56 solar cities projects have been approved. The government has also approved a scheme for setting up 25 solar parks, each with the capacity of 500 MW and above, and ultra mega solar power projects to be developed in the next five years in various states.

8.51 Another major renewable energy policy initiative is the National Offshore Wind Energy Policy 2015 to help in offshore wind energy development, including setting up of offshore wind power projects and research and development activities in waters, in or adjacent to the country, up to the seaward distance of 200 nautical miles exclusive economic zone (EEZ) of the country from the base line. Another development in the wind energy sector is that the accelerated depreciation benefits for wind power projects which were withdrawn with effect from 1 April 2012 have been restored on 18 July 2014. This is expected to help in creating a robust manufacturing base for wind turbines in the country. The Reserve Bank of India has issued guidelines for the inclusion of renewable energy in priority sector lending for scheduled commercial banks.

SUSTAINABLE DEVELOPMENT

8.52 The United Nations General Assembly (UNGA) in its 17th session in September 2015 has announced a set of 17 SDGs and 169 targets which will stimulate action over the next 15 years. This set of goals replaces the MDGs which were coming to an end in 2015 and will try to work in the areas which could not be completed earlier. Unlike the MDGs, the SDGs were adopted after one of the largest consultation exercises in UN history. In the June 2012 RIO+20 United Nations Conference on Sustainable Development, the UN General Assembly's Open Working Group proposed SDGs covering a broad range of sustainable development issues, including ending poverty and hunger, improving health and education, making cities more sustainable, combating climate change and protecting oceans and forests, and were adopted by the General Assembly as part of the broader post-2015 development agenda in September 2015. The SDGs are effective from January 2016 and will end in 2030.

8.53 The agenda highlights poverty eradication, combating inequalities, promoting gender equality and the empowerment of women and girls as the ambient goals and has at its core the integration of the economic, social and environmental dimensions of sustainable development. This also calls for an invigorated global partnership for sustainable development, including multi-stakeholder partnerships, in addition to enhancing capacities of stakeholders in better quality measurement and compilation of data or information on sustainable development. One of the core elements of the outcome document of the SDGs was an effective

follow-up and review architecture which is crucial for supporting the implementation of the new agenda.

8.54 India had made significant progress on the MDGs and has already achieved the target of gender parity in primary school enrolment and halved the proportion of population without access to clean drinking water and is on track on the poverty reduction target. But it is lagging on targets for achieving universal primary school enrolment, reducing child and infant mortality, and improving access to adequate sanitation. In comparison to the MDGs, the SDGs have very comprehensive targets and finding indicators for each of the 169 targets will be a challenge. Moreover, financing and adequate monitoring mechanisms will pose other major challenges. Taking leads from its progress on the MDGs, India will have to prioritize its SDGs, as it will be difficult to target each goal.

CONCLUSION

8.55 Making different countries from the world agree to a common framework on climate change and a set of SDGs in a single year was indeed a monumental achievement. But what is more important is the mobilization of the funds needed for realizing the bold targets envisaged under both and to have a clear action plan for implementation, taking note of the INDCs of individual countries. Successful implementation of the Paris Agreement, the SDGs and the ambitious targets set out in the INDCs will require huge financial resources which cannot be met through budgetary sources alone. Leveraging private finance along with public finance, both international and national, will be critical.