

Mitigation Talks

Series on Nationally Determined Contributions

October–December 2017

Volume 1 | Issue 2

Contents

From Series Editor's desk	1
DIPLOMACY	
Linking NDC Information and the Ambition Agenda	2
<i>Thomas Spencer</i>	
PERSPECTIVES	
Private Climate Finance for India	4
<i>Asbjørn Torvanger</i>	
Gender Justice and Sustainable Development Goal 7	5
<i>Mini Govindan</i>	
MITIGATION BRIEFS	
The Role of Energy Efficiency in the Indian Context	7
<i>Ritu Mathur and Swapnil Shekhar</i>	
INDIA FOCUS	
Addressing the complementarities between India's NDC and Sustainable Development Goals	10
<i>Aishwarya Raj</i>	

EDITOR
Neha Pahuja



The Energy and Resources Institute

From Series Editor's Desk

COP 23, to be held in Bonn later this year, will include the fourth part of the first session of the Ad Hoc Working Group on the Paris Agreement (APA). In its fourth session parallel to COP 23, APA would discuss issues, such as (i) clarity on and accounting of nationally determined contributions (NDCs); (ii) adaptation communication, including those in NDCs (iii) modalities, procedures and guidelines (MPGs) for transparency framework, as in Article 13 of the Paris Agreement; and (iv) global stocktake (GST), as in Article 14 of the Paris Agreement. These issues are likely to conclude next year, however, the meetings in Bonn can be seen as a crucial milestone in steering discussions on the same. This issue of *Mitigation Talks* focusses on some of these issues.

The first article in this issue titled "Linking NDC Information and the Ambition Agenda" discusses the GST and facilitative dialogue and highlights important questions to be considered by the APA. In doing so, the article considers the nature of sources of input for the GST and links it with the discussions on MPGs. The questions raised and discussed by the article are important insofar as they aid in further redefinition of the modalities of GST. Besides, the author also touches upon agenda item one of the APA and reinstates the need for better clarity on NDCs.

In the Perspectives section, the authors touch upon implementation issues in the context of NDCs. The second article in the issue titled "Private Climate Finance for India" discusses the importance of private sector climate finance for India and the key enabling policy instruments to encourage proliferation of private sector climate finance not only in energy but also in sectors replete with scope of more adaptation-related actions.

The third article, while reiterating that most of the NDCs include renewable energy in their contributions, emphasizes upon the role of gender in implementing actions in the sector, which will also be key to achieve the Sustainable Development Goal (SDG) 7. However, the article points to certain discrepancies in the way gender is integrated in the framework of both NDCs and SDGs. This, therefore, highlights the need for better gender integration in the agenda item 3 of the APA.

The fourth article in this issue titled "The Role of Energy Efficiency in the Indian Context" presents a brief case study from India and analyses the role of energy-efficient technologies in achieving India's NDC goals. The case study presents its analysis at the sectoral level and highlights key barriers or catalysers of actions that promote energy efficiency in respective sectors. The fifth article in this issue stresses on the need for complementarities and parallels between climate action and SDGs, elaborating on analysis of India's NDCs and its linkage with SDGs.

Linking NDC Information and the Ambition Agenda

Thomas Spencer, Fellow, TERI

E-mail: thomas.spencer@teri.res.in

As part of the negotiations on the 'rulebook' for the Paris Agreement, the Ad Hoc Working Group on the Paris Agreement is considering "further guidance for the information to be provided by the Parties in order to facilitate clarity, transparency and understanding of NDCs" (1/CP.21, para 28). These should be adopted at the first session of the Conference of Parties serving as the Meeting of Parties to the Paris Agreement (CMA), in 2018. 1/CP.20 adopted a minimum level of guidelines for the upfront information to be provided with nationally determined contributions (NDCs), such that NDC should provide (i) reference point (including, a base year), (ii) time frames and/or periods for implementation, (iii) scope and coverage, (iv) planning processes, (v) assumptions and methodological approaches (vi) and how the Party considers that it fair and ambitious.

The evidence is that these guidelines were an improvement upon the format in which contributions were submitted under the Copenhagen Accord, in terms of transparency, clarity and understanding. This, in turn, has helped ensure greater accountability for NDCs as well as greater robustness of global action.

Nonetheless, it is clear that the upfront information provided with NDCs, while an improvement on the Copenhagen pledges, was still lacking in certain instances, decreasing their transparency and accountability relative to an ideal case. For this reason, the decisions accompanying the Paris Agreement requested the CMA to adopt further guidelines for this upfront information.

At the same time, 1/CP.21 requested

- "those Parties whose intended nationally determined contribution pursuant to decision 1/CP.20 contains a time frame up to 2025 to communicate by 2020 a new nationally determined contribution" (1/CP.21, para 23) and
- "those Parties whose intended nationally determined contribution pursuant to decision 1/CP.20 contains a time frame up to 2030 to communicate or update by 2020 these contributions" (1/CP.21, para 24).

In addition to these two paragraphs, 1/CP.21, para 115 mandates a "proto-stocktake" for 2018, the Facilitative Dialogue (FD). This was seen by some Parties as the opportunity for upward revision of NDCs in 2020, as envisaged in paragraphs 23 and 24 quoted above.

These two paragraphs represent, thus, an exercise in "constructive ambiguity" in the face of differing points of view amongst different Parties regarding raising the global level of ambition. There are three ways to interpret this slightly ambiguous architecture between the FD and its weaker link with the "request" for Parties to communicate or update their NDCs in 2020. Firstly, it may be that some Parties were concerned that those Parties with 2025 contributions would be left without a longer-term commitment towards 2030, and hence, be less accountable to the global effort. Hence they pushed for the inclusion of 1/CP/21, para 23. Secondly, some Parties may have been concerned that the current level of ambition was insufficient to limit warming to 2°C, and further delay in raising ambition would render the 2°C objective out of reach. Hence, they pushed for the inclusion of 1/CP.21, paras 23, 24 and 115. Thirdly, another group of Parties may have been reluctant to commit to raising ambition so "soon" as 2020, particularly when the implementation of NDCs had only just begun. Hence, they may have insisted on a weaker link between the FD and the "request" to update or resubmit NDCs in 2020.

At the current juncture, the resolution of this constructive ambiguity in the negotiations on the Paris Agreement rulebook faces three additional complexities, as discussed in the following section.

Firstly, with the election of the Trump administration and its subsequent decision to withdraw from the Paris Agreement, it appears unlikely that the United States, the principal Party concerned by 1/CP.21, para 23, would submit a new contribution in 2020. Secondly, this weakens an already fragile willingness among a critical mass of Parties to revisit their current NDCs and to actually prepare updated (and strengthened) NDCs by 2020, as per 1/CP.21, para 24. It is, therefore, difficult to see the fulfillment of necessary diplomatic and domestic conditions in key Parties such that momentum could be created for a new round of updated NDCs in 2020. Thirdly, however, the signals from the real economy are that *de facto* climate ambition is moving faster than envisaged in NDCs. The key decarbonization technologies are approaching cost parity with the fossil fuel incumbents at a rate none may have foreseen in the years leading up to the Paris negotiations.

The key question is thus how to resolve the above-described dilemma presented in 1/CP.21 paras 23, 24 and 115, namely that the FD will certainly find that current levels of ambition are insufficient and delay lowers chances of keeping warming to less than 2°C, while at the same time, momentum is lacking for a full-fledged revision of NDCs in 2020. This resolution should be done in a way that (i) reflects the (regrettable) unlikelihood of a full-fledged round of updated contributions in 2020 at the current juncture; (ii) maintains the momentum of international collaboration generated by the Paris Agreement; (iii) captures the current *de facto* momentum in the real economy and strengthens it by bringing it into a further round of collective action. It is important to notice that the third point in the above list may appear paradoxical. Why update contributions if *de facto* progress on decarbonization is moving faster than envisaged? The answer is that NDCs act to anchor and generalize a “new baseline” about the level of global action, both amongst countries but also between countries and non-state actors.

The answer to this dilemma lies in creative use of the FD and the negotiations on the upfront information to be provided with the NDCs. It could be mandated, for example, that in addition to the information required by 1.CP/21, para 27, the following kind of information must be provided with new NDCs:

- In addition to information provided on national circumstance in the context of an assessment of how the contribution is fair and ambitious, a further category of information could be requested on how the global context of collective action, enabling domestic action, has or has not changed since the last communication (regarding, for example, technology trends, international collaboration, implementation progress by key partner countries, and the provision of financing and technology required by developing countries). This would help create a more explicit link between the process of stocktaking collective action (either in the FD or in subsequent stocktakes under the Paris Agreement) and the domestic process of

preparing subsequent NDCs. It would force Parties to consider how the changing context of international circumstances could enable them to take further action in the next round of NDCs.

- Further quantified domestic policy targets relevant to the achievement or overachievement of the NDCs are crucial. Here, Parties could submit additional sectoral or economy-wide targets of relevance to the NDC trajectory, communicating both information regarding implementation and potentially overachievement, *without having to necessarily go through the domestic process and international risk of revising the headline targets of their NDC in 2020*. Thus, revised NDCs would contain two tiers of quantified targets:
 - Headline targets, in some cases these would be same as submitted in 2015
 - Secondary targets, such as in specific sectors. Here, Parties could submit new secondary targets, whose aggregate may imply a greater level of ambition than the headline NDC.

In addition to this, the COP decisions concluding the FD should reiterate the requests of 1/CP.21, paras 23 and 24, as well as adding a link to the conclusion of the negotiation on upfront information to be provided with NDCs. In this way, the following three points will be linked—(i) the findings of the FD regarding inadequate level of global ambition, and hopefully progress on the international enabling conditions of greater ambition (e.g., technology progress); (ii) the request to resubmit or update NDCs in 2020; and (iii) the request to do so in the light of the further upfront information that has been negotiated.

To be clear, in 2020, Parties could submit a new and strengthened NDC, and after 2020, they are obligated to do so under Article 4.9 of the Paris Agreement. However, for those unwilling to do so, and it seems under current circumstances that this will be the majority, the above-described approach would allow the communication of further ambition in 2020 without the revision of headline NDC goals.

Private Climate Finance for India

Asbjørn Torvanger, Senior Research Fellow, CICERO
E-mail: asbjorn.torvanger@cicero.oslo.no

To implement the Paris Agreement's aim of less than 2 °C man-made global warming by the year 2100, huge investments are required for mitigation of greenhouse gas (GHG) emissions and for adaptation to residual climate change.¹ This climate finance can in part be public, but realistically, the lion's share will have to come from private investors. The need for climate finance is especially pressing in developing countries, in comparison to industrialized countries, due to comparatively larger investments needed for adaptation, and financial markets in these countries are less developed.

The significance of climate finance cannot be underscored in a large and fast-growing developing country such as India. The policies of the Government of India should, therefore, facilitate private climate finance from domestic sources and abroad. Private climate finance can be facilitated through a toolbox of financial instruments. Two reports from Center for International Climate Research (CICERO) explore the potential of financial instruments to catalyze private climate finance for developing countries. The analysis is based on case studies, applying the lenses of leverage ratio (the amount of private finance raised per unit of public finance spent), and scaling up potential.² The main conclusions are that the most promising financial instruments largely depend on context, which is the developing country in question, the economic sector, and the type of investment (technology). Private finance for adaptation projects is especially challenging due to intangibility, related to complex interactions with other drivers for societal change, difficult identification of climate change impacts, a long time horizon, public good characteristics of many projects, and climate policy uncertainties.

Based on these general findings, what advice might there be for enabling private climate finance for India? Let

- 1 According to UNFCCC (United Nations Framework Convention on Climate Change), "Climate finance refers to local, national or transnational financing, which may be drawn from public, private and alternative sources of financing. Climate finance is critical to addressing climate change because large-scale investments are required to significantly reduce emissions, notably in sectors that emit large quantities of greenhouse gases. Climate finance is equally important for adaptation, for which significant financial resources will be similarly required to allow countries to adapt to the adverse effects and reduce the impacts of climate change."
- 2 Torvanger, Narbel, Pillay, Clapp (2016), Instruments to incentivize private climate finance for developing countries, Report No. 8, CICERO, Oslo. Pillay, Aakre, Torvanger (2017), Mobilizing adaptation finance in developing countries, Report No. 2, CICERO, Oslo.

us first consider financial instruments presently used for climate-related investments in India. The CICERO reports discuss an *interest rate subsidy* on loans by United Nations Environment Programme (UNEP) and the Shell Foundation for funding a home solar electricity programme. It turned out that perceptions were more important as barrier than underlying economics.³ A *feed-in tariff* and renewable purchase obligation by Government of India facilitated deployment of solar power. The technology, policy, and commercial risks were too high to mobilize private climate finance. Thereafter, the Asian Development Bank together with commercial banks offered *partial credit guarantees* for up to 50% of a project's loan. *Tradable green certificate* mechanisms have been used in India to support renewable energy investments.⁴ The Solar Energy Light Company (SELCO) Foundation used *concessional loans*, in collaboration with regional rural banks, to allow poorer households to access sustainable energy services.⁵ Moreover, a *grant* from the International Climate Fund made the financial instrument attractive to private investors, through halving the cost of the guarantees.⁶ The International Finance Corporation (IFC – part of the World Bank Group) issued a *green bond* to finance its purchase of green bond shares issued by YES Bank, a commercial Indian bank. Through its high credit rating, IFC could also attract secondary investors.

The financial instruments are mostly used to stimulate investments in renewable energy. Clean energy sources are climate related when replacing fossil fuels. Feed-in tariffs and green certificates provide a price premium for investors in renewable energy. A partial credit guarantee and the grant mentioned attract private investments by reducing risk. The interest rate subsidy and concessional loans are directed at households in order to lower the cost of investing in solar electricity production.

Certainly, the scope for these financial instruments to support climate-related projects is much higher than indicated by these examples. Additionally, there is a huge potential for instruments, such as dedicated private-equity

- 3 Frisari, G., Hervé-Mignucci, M., Micale, V. and Mazza, F. (2013), Risk gaps: A map of risk mitigation instruments for clean investments, January, Climate Policy Initiative.
- 4 REN21 (2015), Renewables 2015 – Global status report. Renewable Energy Policy Network for the 21st Century, Paris.
- 5 SELCO (2016), About us. http://www.selco-india.com/about_us.html
- 6 Hervé-Mignucci, M., Frisari, G., Micale, V. and Mazza, F. (2013), Risk gaps: First-loss protection mechanisms, January, Climate Policy Initiative.

funds, public–private partnerships, loan guarantees and first-loss insurance. In terms of catalyzing private investment from industrialized country partners, countries can employ export credit guarantees or public–political risk insurance/ guarantees to stimulate investments in India. Likewise, multilateral organizations, the global climate finance regime and funds with climate-related investments on their agenda (e.g., the Green Climate Fund) can lower the threshold of private climate finance in India. The cases analyzed in the CICERO reports show that high interest on loans is

not the only barrier to climate-friendly investments, lack of information among households and investors also plays a role. This speaks on the value of measures to improve information to the public on profitable opportunities in renewable energy. Another learning is that a combination of financial instruments may be required to enable private investments. Finally, it makes sense for India to emphasize financial instruments to enable investments in adaptation projects, which are particularly challenging to finance and in terms of engaging private finance.

Gender Justice and Sustainable Development Goal 7

Mini Govindan, Fellow, TERI
E-mail: gmini@teri.res.in

The provision of modern energy services, crucial to human well-being, is considered an essential means to support overall economic development and to deal with the challenges posed by climate change. Majority of the mitigation actions included in nationally determined contributions (NDCs) and domestic climate policy are in the energy sector, including policies that target access to affordable and modern energy services. It is also often assumed to be an important input in improving gender equality and social inclusion in contexts where women experience particularly harsh living conditions and discriminatory norms. Growing evidence of impact of energy on end-users has clearly demonstrated that women undoubtedly benefit from access to adequate and reliable modern energy services. The new agenda for sustainable development, which aims to end poverty and promote well-being, prosperity and peace, while safeguarding the ecological systems of the planet by 2030, has, unlike the Millenium Development Goal (MDG), placed a much needed emphasis on energy access by elevating it as a stand-alone Sustainable Development Goal (SDG). In particular, SDG7 encourages national and international initiatives universally towards providing access to 'affordable, reliable, sustainable and modern energy for all'.

The targets and overall objectives of SDG7 are also consistent with the global Sustainable Energy for All initiative (SE4ALL), led by the United Nations (UN), which aims to address access to energy that is clean, healthy, and safe in order to achieve sustainable energy for all by 2030. With its huge network of partners across governments, businesses, international organizations,

financial institutions, and civil society, SE4ALL stands ready to take a leading role in supporting implementation of SDG7, as well as to monitor and report on the progress made towards achievement of the goal. While these goals are most relevant, especially in developing countries, the focus on gender inclusion and gender equality is conspicuous by its absence. The set of indicators identified through an expert group formed by the UN does not explicitly capture the gender dimension of energy access. It is assumed, time and again, that the benefits will trickle down and be of equal use to women and men. However, the focus on gender equality and women's empowerment is explicit across all the SDGs, both as a stand-alone goal on achieving gender equality (SDG5) and as a cross-cutting theme with more than 30 related targets spread across various sectors, such as water, health, education, employment, etc., but it does not mention energy. This appears as a paradox in the light of increasing appreciation in international and national development discourses of the role of energy as a conduit for redressing historic gender inequities. It also raises ethical question regarding gendered distribution of benefits from energy interventions at large, given the huge size of funds invested in energy projects.

On the positive side, SE4ALL does recognize the importance and position of women with respect to energy access and has proposed to extend its objectives with two additional targets—reducing by half the number of premature deaths due to indoor and outdoor air pollution, and providing modern energy services to primary healthcare service providers in developing countries. There is also an implicit message in SE4ALL regarding the

electricity needs of women for productive, educational and communicative services. However, it should be noted that opportunities for women in the energy sector should go beyond clean cooking solutions or viewing women only as end users or beneficiaries of an energy intervention.

India, which is continually dubbed as an 'emerging economy' has effectively committed to achieving SDG7 through close collaboration between the national and the sub-national governments as well as active participation of all other relevant stakeholders. Attempts have been made to align the country's national development goals as per the requirements of the SDGs. However, despite making progress in meeting the SDG7 goal of increase in the share of renewable energy, such as wind power capacity and solar energy production, the country is still characterized by a significant proportion of the population that is poor and deprived of access to modern sources of energy. Moreover, the growing population coupled with India's developmental ambition to support a mounting economy and provide electricity to those who remain without it will only add nuances in ensuring energy security. Hence, the major focus of the policies and programmes has always been to expand the energy services to the population that lacks access, to make the services affordable to the poorest segments of the population and to enhance the availability and reliability of the energy services. Even when the policies have gender-related provisions, they do not explicitly focus on the differentiated needs of women and men and thus, their impact has been limited in practice. Moreover, there are very few success stories wherein women have been actively involved in the decision-making processes,

policy formulation or in the provision of modern forms of energy.

The draft National Energy Policy 2017 continues to emphasize on access at affordable prices and aims to ensure that electricity reaches every household by 2022 and also proposes to provide clean cooking fuel to all within a reasonable time frame. The policy has also covered under its ambit improved security and greater sustainability in view of the threat of catastrophic effects of climate change as well as the detrimental effects of fossil fuel usage. Further, the energy policy also takes into cognizance India's vision of "Make in India" campaign to promote manufacturing and the "24x7 Power for All" drive for universal, round-the-clock electricity supply. While these objectives and goals are highly relevant in an emerging economy such as India, the issues of energy justice and gender equality are not apparent in the larger scheme of energy goals and such challenges are shared across many developed and developing countries and throughout all levels of the energy sector.

Considering that both gender equality and energy security in tandem is critical to sustainable development, integrating gender into SDG7 goals and targets assumes greater significance.

Such integration will also serve as both a precondition as well as an outcome to achieve the target of SDG5, which speaks about strengthening sound policies and enforceable legislation for the promotion of gender equality and empowerment of females at all levels, as energy is considered as one of the contributing factors for economic empowerment.

The Role of Energy Efficiency in the Indian Context

Ritu Mathur, Director, TERI and Swapnil Shekhar, Research Associate, TERI
 E-mail: swapnil.shekhar@teri.res.in

The single largest emitter of carbon dioxide (CO₂) in India is the power sector, but from the demand side, largest emissions come from the industrial sector followed by the transport sector.¹ From the environmental perspective also, minimizing the levels of energy requirement becomes an important target as we seek to meet developmental objectives of improving (energy) access, enhancing employment and increasing per capita incomes of our people. Every “Negawatt” that can be tapped is a boon because it can reduce the pressure on both our financial and natural resources. Energy savings can be achieved by switching to alternative technologies and/or adopting efficient devices, processes and methods across sectors and end uses.

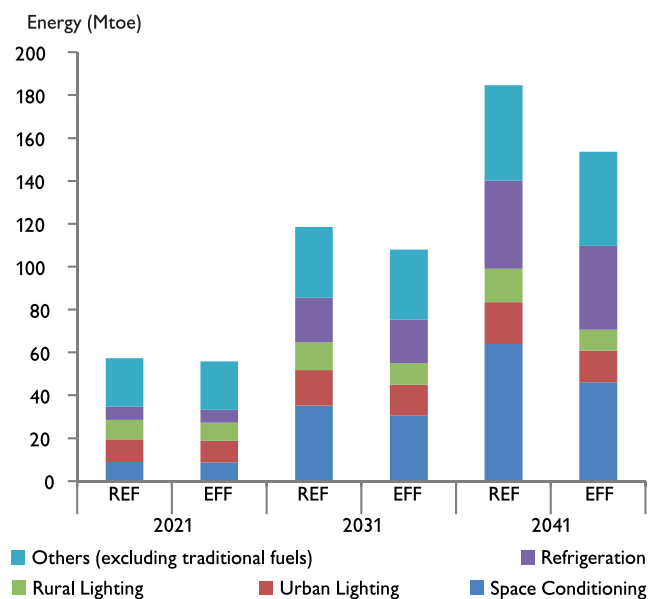
To evaluate this potential, TERI conducted a quick analysis of the potential for energy efficiency by modelling 2 scenarios that are developed to reflect an Efficiency scenario (EFF) vis-à-vis a Reference scenario (REF). The Reference scenario (REF) considers continued adoption of energy-efficient technologies and processes, based on past trends and/or at constrained levels on account of higher upfront costs and consumer choices. The Efficient scenario (EFF) considers a higher level of penetration of efficient options, faster uptake of efficient technologies and swifter phase out of inefficient alternatives fuelled by better policy frameworks and behavioural changes. The choice of technologies in this scenario was based on discussions with various sector experts, such as industry associations and manufacturers, regarding plausible enhanced penetration levels of these alternatives.

The overall results of this analysis indicate that energy efficiency can play a significant role in India’s energy transition. While the energy intensity of India’s gross domestic product (GDP) has been declining at an increasing rate since 1981,² implying that the low hanging fruits in energy efficiency are easily plucked, it is estimated that energy savings of up to 338 Mtoe (5%–12%) can easily be brought into effect over the period 2021–2041, over and above those observed in a BAU growth scenario.

Based on the analysis of two scenarios, we observe that by 2021, the emissions intensity as compared to 2006 levels, decreases by 21% in the REF scenario and 26% in the EFF scenario. By 2031, the REF scenario is able

to achieve only the lower end of the intended nationally determined contribution (INDC) target of 33% emission intensity reduction, but the EFF scenario is able to achieve around 41% reduction, clearly indicating the positive role that a push to energy efficiency can provide at the overall energy sector level. The TERI analysis, also conducted at the sectoral level, is discussed in the following section.

In the residential sector, the main end-uses in which energy efficiency seems to have a significant potential are space conditioning and lighting. Although the appliances in the residential sector have already been constantly improving their efficiency in the past, and this is partly already reflected in the REF scenario as well, by 2041, energy saving potential of another 31 Mtoe (10% with respect to REF scenario) can be envisaged, largely attributed to expected efficiency improvements in space conditioning and lighting technologies.



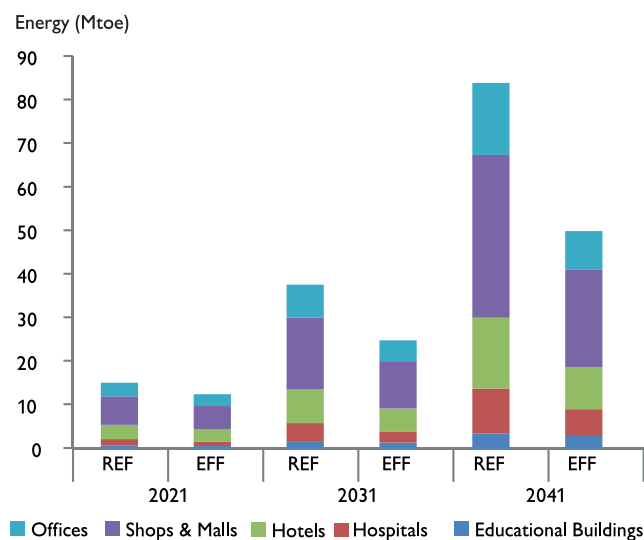
Residential Energy Consumption (Mtoe)

The commercial sector indicates a significant potential for energy efficiency, ranging from about 7% in 2021, 15% in 2031 and 18% by 2041 in the EFF scenario, as compared to the REF scenario. By 2021, 2031, and 2041 as much as 3 Mtoe, 13 Mtoe, and 34 Mtoe, respectively, could be saved between the two scenarios. These savings could accrue by energy efficiency in commercial buildings as well as efficiency improvements in end-uses, such as street lighting.

1 MOEF. (2010). *India: Greenhouse Gas Emissions 2007*. New Delhi: Ministry of Environment and Forests, Government of India.

2 Planning Commission. (2013). *Twelfth Five Year Plan (2012–2017) Economic Sectors (Vol.I)*. New Delhi: SAGE.

However, improvements through building efficiency seem to be the largest component, mainly stemming from a very different pattern of growth emanating for buildings. So, for instance, in place of small shops, there exists the concept of malls, and centrally air conditioned buildings have replaced schools and office buildings that relied on natural ventilation and basic electrical equipment. These changes can lead to large differences in the levels and patterns of energy use in these sectors. For example, an estimate indicated that the electricity consumption in the shopping malls of Mumbai accounted for a consumption of nearly 14 MU/month, which is equivalent to the power consumption of 12,454 rural households in India.³

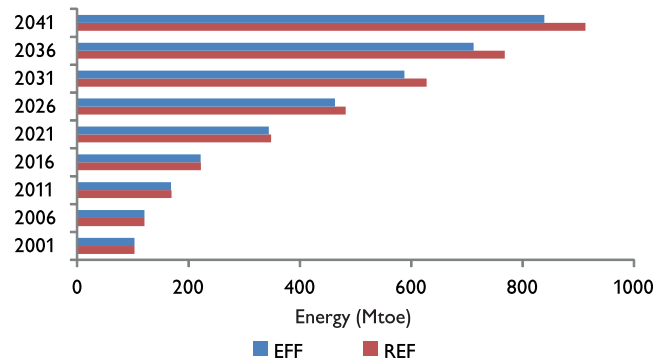


Energy use in Commercial Buildings (Mtoe)

In the transport sector, efficiency improvements are expected to accrue on account of shifts from road to rail-based movement and improvement in efficiencies of road-based vehicles as well as in the aviation sector. Efficiency improvements in the vehicle fleet are expected to occur in sync with autonomous efficiency improvements over time globally in the automobile industry rather than specific to India. Further, the introduction of electric vehicles is expected to lead to displacement of petroleum products, especially in the later time periods when electricity generation itself is much more decarbonized. All these elements are important for the transition within the transport sector as a whole, and can account for energy savings of 3 to 37 Mtoe (2%–6%) between 2021 and 2041.

The key large energy-intensive industry sub-sectors that indicate a potential for energy efficiency improvements, include the iron and steel sector, followed by the bricks, cement, and aluminium sectors.

³ Pachauri, R K. 2017. *The Dark Side of Shopping Malls*. The Pioneer, August 25.



Energy Use in Industrial Sector (Mtoe)

A first crucial step in achieving energy efficiency is to understand the sector, identify the main areas of focus and consequently undertake rectification measures. The PAT (Perform, Achieve and Trade) scheme has been successful in reducing 9 Mtoe in the first cycle⁴ but the degree of understanding of how and where energy is used is perhaps more significant so that efforts can be directed at bringing in greater efficiency and reducing energy consumption in these areas.

Since many measures have already been undertaken in certain industrial sectors, the potential to achieve more may be restricted in these domains. One such example is the cement industry wherein India is among the world best in terms of efficiency levels. However, there is still a significant potential of energy savings in this sector. Iron and steel shows a potential of saving up to 45 Mtoe by 2041. Another key sector of importance is the micro, small and medium enterprises (MSME) sector, which can save at least 15 Mtoe by 2041. Although a few initiatives have been undertaken by government/bilateral/multilateral organizations to help MSMEs improve their energy performance, there is a lot more that can be accomplished.

Although total energy use in the agriculture sector is not huge, use of more efficient pump sets can bring in savings of around 4%–19 % during the period accounting for up to 6 Mtoe by 2041.

The potential savings discussed in the preceding paragraphs can be realized, subject to overcoming the barriers and challenges that these sectors and end uses face in the uptake of energy efficiency. For instance, subsidized electricity in agriculture leads to inefficient use of pump sets and therefore such aspects need reliable energy to contain their use of energy.

Likewise in the residential sector, Delhi has started to see a peak at midnight during August–September, which seems to be explained by the heavy use of air conditioners in households in the city during these months. This is a

⁴ Ramesh, M. 2017. *Energy efficiency scheme leads to ₹ 37,685-crore savings for the country*. The Hindu Business Line, 22 March

complete change from the situation in the past when the peak was seen in the evening or morning hours. Therefore, with changes in the end-uses contributing to energy growth, action also needs to be focussed differently. For example, the need for producing extremely efficient air conditioners could assume high priority to manage such peaks. Also, while there have been some success stories with the LED experience, maybe similar business models to increase the sale of cheap and efficient air conditioners could play an important role as India acquires a more urban character and develops further.

Also, while goods and equipment have been constantly upgrading the efficiency levels with the star labelling programme, among other similar measures, growth in sales and uptake among consumers has been on the higher side in comparison to what efficiency improvement has so far been able to contain.

The main barriers mentioned to the uptake of the efficient technological options are often the high upfront costs of alternative technologies and processes and/or the

need for a stronger policy push/business models to scale up the uptake of the more efficient options. However, there are opportunities in some sub-sectors, such as irrigation in the agriculture sector, retrofitting in existing industrial technologies or lighting and space conditioning in the residential and commercial sectors wherein changes could possibly be brought in fairly quickly and economically.

Bringing in learning outcomes from other countries on energy efficiency measures could be relevant to maximize the gains from energy efficiency. For example, Japan has developed a carbon reduction reporting system for small and medium enterprises (SMEs) that involves both mandatory and voluntary reporting to the Tokyo Municipal Government (TMG).⁵ Based on these inputs, the TMG then educates the SMEs about energy efficiency strategies to gear them in a desirable direction. In Curitiba, Brazil, an improved public transportation system has led to one of the lowest per capita gasoline consumption in Brazil despite the second highest car ownership rate.⁶

5 World Bank. 2010. *Cities and Climate Change Mitigation: Case Study on Tokyo's Emissions Trading System*. World Bank.

6 Golub, A. 2004. *Brazil's Buses: Simply Successful*. ACCESS Magazine, 1(24).

Addressing the complementarities between India's NDC and Sustainable Development Goals

Aishwarya Raj, Research Associate, TERI

E-mail: aishwarya.raj@teri.res.in

The Nationally Determined Contributions (NDCs) and the Sustainable Development Goals (SDGs) have subsumed a core concern arising for the developing world today—developing sustainably amidst tackling the changing climate. The Intergovernmental Panel on Climate Change (IPCC) clearly states that the rise in global temperature should limit to the 'well below 2°C' mark. The global governance of climate change has, therefore, ventured into a new cycle of 'collective climate action which is nationally driven'.

Both NDCs and SDGs were formulated around the same time in 2015 targeting the year 2030 as the assessment year (although few NDCs have 2025 as the first assessment point in the cycle). The NDCs served as driving actions at the national level, keeping in mind the national context whereas the SDGs assigned importance to a diverse set of goals that would encompass the national concerns of Parties. As a result, the leap from Millennium Development Goals (MDGs) to SDGs has seen an expansion of targets comprising of eradicating poverty, ensuring food security, climate action as well as other goals, such as those on water security, forestry, human rights, good governance, gender equality and international cooperation. The fact that climate change stands tall as 'Goal 13' in the SDGs demonstrates the scope for building a complimentary relationship between the NDCs and the SDGs. A proper deliverable of SDG 13 would consist of sound climate policies at the international, national, and sub-national levels. A sustainable development trajectory within nations would build societies based on low-carbon growth models, thereby contributing to mitigation as well as building adaptation capabilities.

Moreover, this complementarity between the two can yield results that would serve to be co-beneficial for both the settings. For example, mitigating air pollution domestically would help a state not only mitigate GHG emissions (Goal 13) but also help in protecting its citizenry from aggravated health concerns (Goal 3). In this manner, one would not only be catering to sustaining growth and livelihoods for its citizenry but also contributing to a multiple set of SDGs simultaneously.¹ Thus, there is

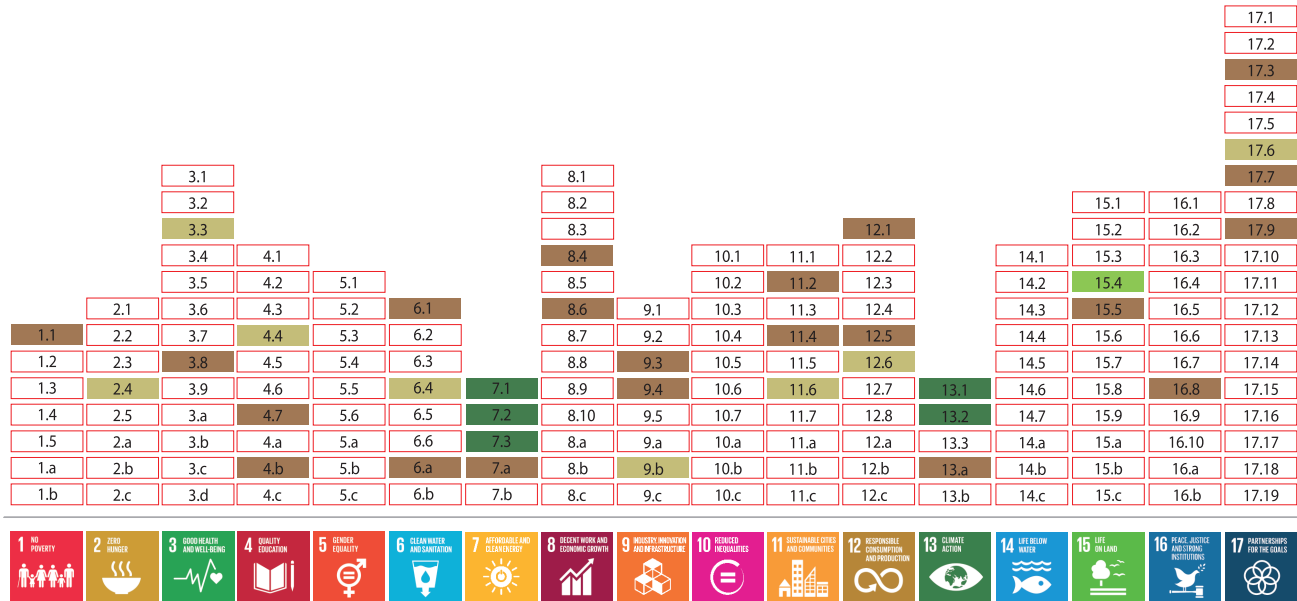
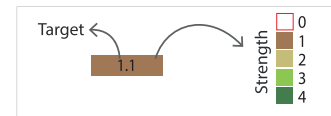
scope not only to link NDCs and SDGs but also to link the SDG targets within themselves. Integrating policies would then yield better results by optimally utilizing resources and saving time and finances for governments. This would specifically serve to be beneficial for developing countries, such as India and others in the Global South, who need to address the dual responsibility of elevating to a higher economic status alongside combating climate change. Since most of these countries are in their crucial stages of development, it is only natural for them to adopt a low-carbon path that sustains their livelihoods while at the same time contributes to the promise of collective action. With rapid urbanization rates and population growth, the demand for resources and infrastructure will rise, and without advancing on a sustainable path to development, these countries will fail to meet the SDGs and at the same time be unable to increase their capacities to tackle the impacts of climate change. Not just for the sake of meeting negotiation targets but also for domestic security, it is therefore imperative to develop capacities to withstand climate impacts, which most likely are going to sweep the Global South due to its vulnerable geography and capacities.

India's Nationally Determined Contributions

India's NDC explicitly mentions the need to integrate climate action with sustainable development when it reads "We promote sustainable production processes and also sustainable lifestyles across the globe."² India's policy premise is based on the notion to eradicate poverty for an all-round socio-economic development and to base climate actions on an all-inclusive framework. Given the developmental scenario, India will witness 40% increase in urbanization and 25% increase in population, which will only add more pressure on the existing resources, thus, requiring immediate resolutions. The extreme vulnerabilities due to India's geography, alongside the previously mentioned concerns regarding the deficit

1 Syed A A Farhan, Zeenat Niazi. Avenues of Alignment between Sustainable Development Goals and the Paris Agreement in India. Development Alternatives [Internet]. 2016. [Accessed 2017 May 15]; Available from: http://www.devaltd.org/Pdf/L2_SixThemePdfs/Climate%20SDG%20Paper.pdf?Tid=115

2 India's Intended Nationally Determined Contribution: Working Towards Climate Justice. UNFCCC. [Internet] 2016. [Accessed 2017 April 5]; Available from: <http://www4.unfccc.int/submissions/INDC/Published%20Documents/India/1/INDIA%20INDC%20TO%20UNFCCC.pdf>



infrastructural, financial and technological capacities, dual constraint of addressing current growth crevices and future pressures will only add on to India's concerns regarding national capacity. Recognizing the need to then "develop without destruction" has promoted this idea of low carbon growth for India.³ Moreover, as suggested earlier, for attaining its elemental goal of eliminating poverty, India needs to prudently cover a range of SDGs under its climate change agenda. In fact, this idea has also been propagated by India's developing counterparts in the Global South, wherein 9 out of 44 Asian NDCs had an explicit mention of SDGs that supported bridging the gap between these two agenda items.

For India then, Goal 2 (Zero Hunger), Goal 3 (Health), Goal 4 (Education), Goal 5 (Gender), Goal 6 (Water and Sanitation), Goal 7 (Energy), Goal 8 (Economic Growth), and Goal 11 (Sustainable Urbanisation and Human Settlements) could be the logical targets to include within this complementarity framework. Goal 13 (Climate Action) and Goal 15 (Forestry and Biodiversity) could fill up the 'NDC' side of the linkage with direct congruencies with the targets under these two SDGs. Specific target matches of India's mitigation contributions and adaptation requirements with SDGs would further help in highlighting the potential policy options for NDC-SDG integration.

³ India's Intended Nationally Determined Contribution: Working Towards Climate Justice. UNFCCC. [Internet] 2016. [Accessed 2017 April 5]; Available from: <http://www4.unfccc.int/submissions/INDC/Published%20Documents/India/1/INDIA%20INDC%20TO%20UNFCCC.pdf>

Therefore, it would be interesting to study the SDG footprint on India's NDC and seek the strong and weak complementarities that persist for India holistically. This would also help determine if congruencies observed could be utilized to develop a universal approach for global governance and address the concerns of mitigation and adaptation categorically.

The above infographic replicates the NDC-SDG linkages and the SDG footprint on India's NDC. Out of the 169 targets present in the SDGs, there were 35 matches from India's NDC. Upon assessment, India's NDC saw 14% of recurring matches implicating very strong linkages, 3% quantitative matches and 23% qualitative matches in the NDC-SDG complementarity analysis. Amongst the top 14% matches, India's NDC-SDG linkage profile clearly showcases that the strongest linkages are with Energy (Goal 7) and Climate Action (Goal 13). Other sectors, such as resilient agriculture, water security, sustainable industries, greener urban settlements, efficient transport and conservation of biodiversity and forestry also find a place in the linkage chart. As expected, the SDGs 2, 6, 9, 11, 15 and 17 outline the various branches of complementarity that exist in this NDC-SDG linkage. As remarkable as its ambitions are, India much like its other Asian counterparts will be able to succeed in both national and collective action only with an enhanced cooperative network. As shown in the above infographic, Goal 17 finds four congruent matches and all pertain to assistance required

in the domain of finance, technology and cooperation as well as capacity building. This prioritizes SDG 17 as India's prerogative, especially for a coherent NDC–SDG policy integration.

There is immense potential to emancipate the socio-economic status by engaging in North–South and South–South partnerships, which is an essential tenet of Goal 17. Much like India's initiative to engage in a global collaboration for R&D, other regional parties could also do the same, especially within Asia. Additionally, there could be graver emphasis added on unmatched SDGs, such as Goal 5 (Gender), Goal 10 (Reducing Inequalities), and Goal 16 (Peace, Justice and Strong institutions) as these form the crux for all-inclusive growth and climate action. Gender can help catalyse the scope for mitigation positively as in sectors where women dominate and efficient use of

resources and sustainable livelihoods can be practiced. Increased capacities reflect vigorous institutions that can make India more self-reliant and depend less on external sources for assistance.

Therefore, the complementarity between NDCs and SDGs can help bridge the existing gap between capacities and execution, provided the developed countries participate generously to Goal 17 of SDGs and emancipate the developing world. The trade-offs between development and environmental safeguarding can be best accommodated by sustaining both development and climate action with inclusive participation and support for the developed world. This would not only help achieve the goals set out in the Paris Agreement for collective action but also yield compelling results for the Global South and India.

The Paris Agreement sets an ambitious goal of keeping the increase in temperature rise well below 2°C. Almost all countries put forward their INDCs as a start towards meeting this goal, which were further revised as NDCs. Further, countries also agreed to undertake regular stock-taking to assess whether they will be able to reach their commitment and to what extent their efforts are enabling them to keep the GHG emissions trajectory on track with the above-mentioned goal. The achievement of these goals will depend on (i) effective implementation and (ii) enabling means of implementation or support. Continued analysis, deliberations and knowledge sharing is imperative for countries to implement their 'NDCs' along with identifying specific international cooperation needs. This project aims to contribute to this effort. The focus of the project is on issues related to implementing NDCs in both the international and domestic context. The following activities will be undertaken under this project:

1. Tracking of NDCs and domestic linkages with SDGs
2. Role of international cooperation and domestic innovation on climate finance
3. Technology cooperation needs for implementing and enhancing India's NDC
4. Understanding gender dimension in mitigation actions

This series of *Mitigation Talks* acts as a platform to initiate discussions on various issues under these four themes.

For more information, contact:

Neha Pahuja

Fellow, TERI

The Energy and Resources Institute (TERI)
Darbari Seth Block,
IHC Complex, Lodhi Road,
New Delhi 110 003

Tel: 24682100 or 41504900

Fax: 24682144 or 24682145

Web: www.teriin.org

E-mail: neha.pahuja@teri.res.in