

Policy Paper on Environment and Climate Change

(PIC 'Innovating India: Roadmap for 2019-24')

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The summer of 2018 saw the continental US have its [hottest ever month of May](#) while Japan was wrecked by record 3-digit temperatures killing at least 86 people. The Algerian oil town of Ouargla recorded a high of 124°F and Nawabshah in Pakistan recorded 122°F (50°C) on April 30. Los Angeles also recorded 106-108°F for 2 weeks in July. Environmental scientists' world over agree that the current pattern of heat wave is more than two times in frequency and hotter in intensity than normal due to the global warming. Over past 30 years, 3/4th of the Arctic sea-ice has been melted away and Himalayan glaciers have receded more than 40% in many areas. With loss of heat-reflecting ice sheets, the polar regions are getting hotter much faster, risking exposure of frozen permafrost below that; and release Methane gas which is a very potent GHG, capable of creating cascading warming effects, that would be difficult to control.

Human footprint on natural environment has become so large that it is threatening to disturb nature's balance. Steady growth in global population combined with increasing demand for energy have led to unprecedented exploitation of fossil-fuels to support the phenomenal advances of the modern civilization. Environment has become a casualty in this march for human economic progress and its impact on water resources, biodiversity, waste generation and the very quality of air that we breathe, have become serious concerns. But the 'climate change' alone threatens to overwhelm all those concerns with its global scale impact and the silently-building dangerous potentials. Hence this paper will focus mainly on climate change related issues and not the wider issues of environmental preservation policies, laws or implementation problems.

Inter-Governmental Panel on Climate Change (IPCC) was formed in 1988 to address the global warming concern and the Rio climate conference in 1992 helped in spreading awareness about the global warming due to increasing GHG gas concentration in Earth atmosphere - which crossed 410 ppm level of 'CO₂Eq' gases in March 2018, compared to the pre-industrial normal level of about 270 ppm. The global average temperature is already 1°C above that normal and extreme weather events with sustained high temperatures, sudden heavy precipitation and floods, melting of polar ice sheets etc. are already visible. Unfortunately, despite IPCC warnings and the periodic international climate conferences leading to 'Paris Conference' pledges in 2015 by 195 countries, the actual collective global action has been far below what is needed. Maximum 2°C temperature rise by year 2100 was the agreed threshold 'never-to-be-crossed'; but global emissions are still increasing and even if most NDC commitments are met by 2030 we may still be on a pathway to over 3°C rise by year 2100 with its severe consequences. Recent IPCC special report has revised the warning that earth should not get warmer than 1.5°C (above pre-industrial average) to avoid catastrophic impacts and the window of opportunity is just 10-12 years. Hence global action on war-footing is a must now.

Global warming is a slow, invisible and cumulative process that cannot be easily recognized as a clear danger like an earthquake or a terrorist attack. Hence there is still

a sizable lobby of climate deniers funded by the fossil-fuel industry. Present US President is one such denier who has reversed many policies of the earlier government for supporting climate actions. However, increasing evidence around the world is becoming more convincing for acceptance of climate change as 'reality' and the fossil-fuel industry itself has started investing in renewable energy options like Solar and Wind. But just that may be too little, too late for arresting further global warming.

There is growing realization that the predictions in the IPCC reports have been cautiously conservative and climate induced changes such as polar ice sheet melting or longer lasting droughts are actually happening much earlier than anticipated. Globally humanity is adding over 40 Gega-Tons of 'CO₂Eq' gases in the earth system every year and the present carbon budget (for remaining within 2°C warming) is just about 800 GT which would be exhausted in 20 more years. The oceans that absorb over 70% of CO₂ emissions are already getting acidic and losing their capacity to absorb more. Average Sea level is already rising at 2-3 cm per decade that would make vast coastal areas uninhabitable within 20-30 years, forcing millions of climate refugees inland. Unless very drastic and coordinated emission-reductions can happen globally within the next 12 years, human civilization is heading for extraordinary financial stresses and livelihood losses. The pinch is already begun to hurt and for young children of today who may be over 80 years old in 2100, normal organized modern life that we enjoy today, may become truly impossible.

India has been acutely aware that the impact of climate change will be more severe for it than for most other advanced nations, even though its per capita emission is just ¼ of global average and 1/15 compared to USA. However, the large population of over 1.3 billion has made India the 4th largest emitter. Hence it has become imperative for India to reduce its net emission despite being on a fast growth curve. Internationally India has been arguing for differentiated responsibility for global warming and demanding that richer developed countries must take larger responsibility and provide technology and funding for climate change mitigation as well as adoption measures by India. However, as the situation gets more urgent with ever increasing emission levels, it has become necessary for India to act unilaterally to significantly improve its energy efficiency and simultaneously enhance its RE (Renewable Energy) generation capacities so that the GHG emissions could be reduced without compromising its development goals.

Climate change policies in India were first articulated in 2008 in the National Action Plan on Climate Change (NAPCC) that aimed to integrate climate concerns with sustainable pathways so as to support both economic and environmental objectives. The NAPCC was organised around eight missions which provided direction for the national objectives for climate change action, ranging from solar power development to agriculture practices and water conservation. Prime Minister's Council on Climate Change was created in 2010 to focus on urban-scale engagement for 'Sustainable Habitat' goals. State governments were asked to align their policies with NAPCC missions and the Ministry of Environment, Forest and Climate Change (MoEFCC) was tasked to monitor progress while allowing for State specific priorities. By the end of 2016, 32 states and union territories in India had established State Action Plans on Climate Change that have been endorsed by the MoEFCC standing Committees.

Over 60% of India's population is expected to live in urban communities by 2040 and be responsible for over 75% of national emissions. Hence India's climate performance will largely depend on prudent policies for urban development. Many cities across the world have demonstrated their leadership in climate action. Indian cities too need to work out effective mechanisms to participate in this global collective. India's environment policies for the immediate future must ensure that at least the 100 'Smart Cities' of India emerge as flag bearers of comprehensive climate action in the next 12 years to 2030.

On 2nd October 2016 India's Prime Minister at the Paris Climate Summit committed to ambitious goals for the country to arrest climate change, promising to reduce the intensity of greenhouse gas emission per unit GDP growth by 33 to 35 % below 2005 levels by 2030. He also promised that at least 40% of India's energy-basket would be from non-fossil fuel sources by 2030. The promise included rapid increase in forest cover, so that an additional carbon sink of up to 3 billion tons of 'CO₂Equ' is created by 2030. India also crafted the 'International Solar Alliance' in Paris that can establish regional synergy for coordinated shift to clean renewable energy (RE)). India has also announced plans to shift substantially to electric mobility by 2030 in a concerted drive to drastically reduce automotive emissions and reduce air-pollution in cities.

However, inquiries reveal that specific plans and time-bound targets for fulfilling the NDC commitments are yet to be finalised and MoEFCC hopes to have such plans ready only by 2020 for actions up to 2030. Meanwhile 'Business as Usual' is continuing with GHG emissions continuing to rise and loss of precious time for coordinated climate action. This is alarming, because the delay makes the targets harder to achieve. If India fails to achieve its NDC commitments, it would lose the moral authority for a leadership role at International fora for demanding strict action by all developing countries.

Policy Recommendations –

India has been ahead of many countries in establishing the framework and structure for environmental protection and climate action with well-articulated policy objectives. However, effective implementation has been rather poor without adequate accountability and often misguided political priorities. In a happy exception, the focus on renewable energy has resulted in total Solar generation capacity of 24.5 GW as of 31 March 2018 and achieving of ambitious target of 100 GW by 2022 looks very doable. Given that fossil-fuel based electricity generation is responsible for over 65% of total emission, moving away from fossil-fuels as quickly as economically feasible – must be the top policy priority for India.

Policy orientation must also encourage distributed generation (DG) of Renewable Energy (RE) like rooftop solar that can be used with zero losses. DG is also well suited for wind and biogas generation with all the added advantages of de-centralization that would encourage empowerment of citizens. Properly planned and correctly priced 'Net-Metering' by the Power distribution companies can hugely incentivize roof-top generation and innovative micro-grid based efficient use of electric power. A recent pilot project by IIT Chennai has demonstrated how a cluster of 1000 household can be energy independent by using microgrid integrated with modern technology of battery storage

with almost zero emission. India must invest in the latest innovations for solar and wind efficiency improvements and also in the latest advances in Battery and other power storage technology options.

The commitment of major shift to electric mobility by 2030 may very challenging but it would be a stellar achievement if all the electric vehicle charging can also be done via distributed solar charging stations or with other RE sources. Without such a parallel infrastructure development, the initiative may result in major additional loading of the grid power supply that may still be dependent on fossil-fuels. That could create additional grid power requirement and defeat or delay the transition to RE.

Performance of major cities will be crucial and hence local bodies must be made more efficient not only for climate action but also for preservation of rivers and water bodies and expanding the green cover of the city even if that means opposing the powerful builder's lobbies with political influence. This would not be an easy task without robust policy framework and adequate human resource to ensure strict compliance.

Most of the construction by 2030 will be new structures yet to be built. This offers an enormous opportunity for city planners to create resilient cities where energy and water conservation must be at the best levels that technology can offer. Efficient garbage disposal including its reuse for energy generation should also be a must for all new development clusters in expanding satellite cities. As proved in many countries, selection of visionary Mayors for the key cities and empowering them for 5 years of uninterrupted rule with 'city-first' priorities, can go a long way.

At the national policy level, an integrated and planned approach for rapid shift away from fossil-fuels will be crucial for India's overall climate action performance. National policies must also encourage induction of modern technology inputs for alternate clean energy options as well as technology solutions for carbon sequestration and storage. The overarching policy guidelines for the future must also recognize the limits of economic growth beyond which it would not only hurt the environment but also cause devastation to human life, if timely actions are not taken to prevent further climate induced impacts.

This would call for a conscious change in modern urban life-style that must become low on energy demand and high on carbon emission restriction. Several countries are already considering a 'carbon tax' so that market forces could drive the new 'low-carbon' economy. India should take a lead in this regard and introduce a 'Carbon Fee' of say, Rs 1000 per Ton of emission at source and use the earning to offset the rise in cost of living for the tax-paying public. This would require a steely political resolve and a citizen movement to save the eco-system for future generations who would otherwise curse the present generation for being so short-sighted and selfish.

It is important to note that a Govt initiated study by environmental economist Dr Partha Dasgupta's report on evaluating economic progress, that includes the value of the stock of country's natural, human and physical assets, continues to be debated for possible revision to the definition of growth in the context of increasing climate change concerns.

As regards the financial implications of the required policy reforms and climate actions, it is important to note that cost of timely action will invariably be much less compared to what may turn out to be the cost of 'No Action' in terms of the much higher cost of recovery from climate induced disasters.

The next few decades of the 21st century represent a unique opportunity for making it the best century that saved the humanity as it has evolved to present status – or else it would go down in history as the century when humanity destroyed its own future!
