

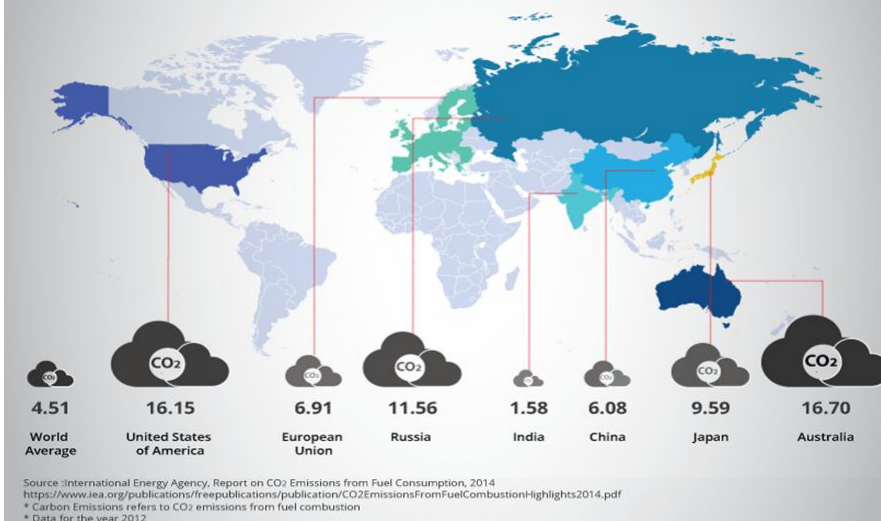
Enhancing Energy Efficiency & Lowering GWP of Refrigerants

Karan Mangotra

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Per Capita Global Emissions The Global Perspective

India's per capita carbon emissions are far lower than other major economies



Paris Agreement is a Step Ahead



India's INDCs

TACKLING CLIMATE CHANGE IN STEP WITH THE WORLD

India's voluntary 'Intended Nationally Determined Contributions' or INDCs seek to ensure a better standard of life for the nation's poor, and a better environment, through sustainable and responsible development.

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|---|---|
| <p>1 REDUCE CARBON INTENSITY OF GDP
33% to 35% reduction from 2005 levels by 2030.</p> | <p>2 INCREASE SHARE OF NON FOSSIL FUEL BASED ELECTRICITY
40% share from non-fossil fuel energy sources by 2030. 175 GW of renewable energy generation to be added by 2022.</p> |
| <p>3 ACCELERATE AFFORESTATION EFFORTS
Create additional carbon sinks of 2.5 to 3 billion tonnes of CO₂ equivalent.</p> | <p>4 ADAPT TO CLIMATE CHANGE THROUGH DEVELOPMENT PROGRAMS
An initial corpus of USD 55.8 million for the National Adaptation fund to invest in development programmes in various vulnerable sectors.</p> |
| <p>5 ADOPT A CLIMATE FRIENDLY AND CLEANER PATH
23 million tons of fuel savings through National Mission for Enhanced Energy Efficiency.</p> | <p>6 PROVIDE ADEQUATE FUNDING FOR INITIATIVES
National Clean Energy Fund to mobilise USD 3 billion to execute our plans for combatting climate change across sectors.</p> |
| <p>7 ADOPT AND PROMOTE LOW CARBON-INTENSIVE LIFESTYLES
Sustainable living models based on traditions and values of conservation and moderation.</p> | <p>8 ADOPT CUTTING EDGE TECHNOLOGY
Create framework for quick diffusion of cutting edge climate technology in India and collaborative R&D.</p> |

Our aim is to promote Sustainable Development that is centered on the unity of humanity and nature.

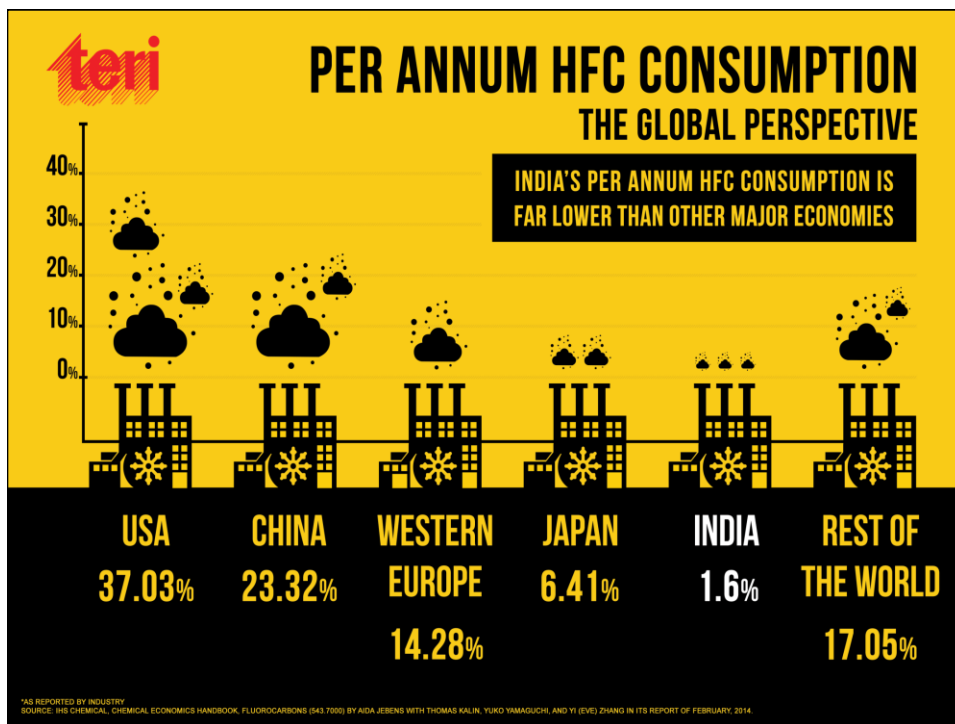
India: 8 levers are identified in the INDC, of which 6 are also quantified



Reduction levers		Included in INDC?	Specification
Energy	Non-fossil	Wind	<ul style="list-style-type: none"> Wind: 60 GW by 2022 100 GW by 2022
		Solar	<ul style="list-style-type: none"> Biomass: 10 GW by 2022 Nuclear: 63 GW by 2032
		Other	
	Energy efficiency	Buildings	<ul style="list-style-type: none"> E.g. Energy Conservation Building Code
		Industry	<ul style="list-style-type: none"> E.g. Perform, Achieve and Trade scheme
		Transport	<ul style="list-style-type: none"> E.g. Vehicle fuel efficiency standard
	Fuel shifts	Coal to gas	<ul style="list-style-type: none"> Not mentioned in the INDC
		Transport (NG/ biofuels)	<ul style="list-style-type: none"> 20% blending of biofuels
	Non energy	Specification	<ul style="list-style-type: none"> Not mentioned in the INDC
Other	Non-core energy	Methane	<ul style="list-style-type: none"> Non-CO2 emissions are not mentioned specifically in the INDC.
		Nitrogen oxide	<ul style="list-style-type: none"> However, various measures related to reducing emissions from waste are included.
		Other	
	LULUCF ¹	Afforestation	<ul style="list-style-type: none"> Additional (cumulative) carbon sink of 2.5 to 3 billion tonnes of CO₂ equivalent through additional forest and tree cover by 2030.
		Reforestation	

¹ LULUCF: Land Use, Land Use Change and Forestry





India's ambitious stance at Kigali

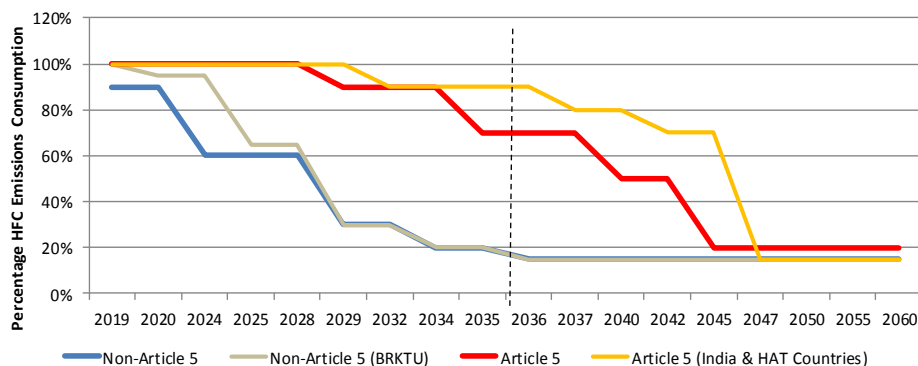
India took responsible steps to move up its ambition from an initial proposal to phase-down HFCs from 2031 to a schedule which begins phasing down HFCs 3 years earlier

India announced mandatory HFC-23 incineration through domestic resources while other countries are seeking MLF funds for this

India also announced an ambitious collaborative R&D programme to develop alternatives to HFCs

Kigali Amendment

HFC Phase-down Schedules of Countries under Kigali Amendment



Key takeaway

A Decision on Energy Efficiency

- **Decision (XXVIII/3) on Energy Efficiency included in the Kigali Amendment for the first time** – demonstrates recognition by countries on catalyzing benefits from energy efficiency along with sectoral transition
- **\$80-million 'Kigali Cooling Efficiency Fund'** was launched for developing countries to provide an opportunity to improve energy efficiency of appliances while shifting to HFC alternatives

Emerging Opportunities: Enhancing EE & Lowering GWP

- There are several low-hanging fruits in the area of energy efficiency technologies that can be captured by Indian AC manufacturers
- These measures primarily focus on optimizing the cooling capacity, thereby improving the Energy Efficiency Ratio (EER) of the equipment
- Choice of compressor technology can affect EER up to 2%, cause lesser noise reduction cost of maintenance and hence reduce the life cycle cost of equipment
- The quality of refrigerant gas plays a significant role in determining the cooling capacity.
- Some low GWP refrigerant gases have been shown to achieve 11% higher energy efficiency than the minimum requirements for five star rating

The resulting energy efficiency gains and emissions mitigation will also play a significant role towards achieving India's INDC with respect to the target of 33-35% reduction in emissions intensity.

From Politics to Economics...

