



Green Cooling Solutions in India by 2040

For Prelims: Green Cooling Solutions in India by 2040, World Bank, ICAP, Green House Gas, PMAY, Thermal Comfort.

For Mains: Green Cooling Strategies for Sustainable Development.

Why in News?

According to the report '**Climate Investment Opportunities in India's Cooling Sector**' released by the [World Bank Group](#), investment opportunities in India's cooling sector through less carbon-intensive technologies could add up to USD 1.6 trillion.

What are the Highlights of the Report?

- The report analyzed the [India Cooling Action Plan \(ICAP\)](#) launched in 2019 and came up with suggestions for prioritizing the government's investment opportunities in the cooling sector.
- The report does not focus on air conditioning because only 40% of Indians will have air conditioning by 2040 — which is currently around 8% — and the rest for whom passive cooling technologies have to be the focus.
- Investment opportunities across three different sectors — **construction, cold chains and refrigerants** — have the potential to **reduce [greenhouse gas \(GHG\) emissions](#)** significantly and also **create nearly 3.7 million jobs**.
- Around 34 million people in the country **might lose their jobs because of heat stress** and subsequent decline in productivity.
- The world is already **on a path where there would be many more intense heat waves** like the one India witnessed in 2022
- Heat stress is set to increase drastically in a world **on its way to a two-three degree rise in temperatures**.

What are the Recommendations?

- **Sustainable Space Cooling:**
 - Sustainable space cooling solutions may **reduce annual GHG emissions by 213 metric tonnes** of carbon dioxide equivalent by 2040.
 - This can be achieved by **increasing the efficiency of cooling technologies** — air conditioners, ceiling fans and chillers — which can save 30% energy by 2037-38.
- **Passive Cooling Strategies:**
 - Passive cooling strategies for buildings in cities can reduce **energy usage by 20-30% by 2038**.
 - A drop in the temperature of a building by one degree Celsius **could lower peak electricity demand** for cooling by two-four per cent.
- **Thermal Comfort:**
 - Government should include a thermal **comfort programme** in its affordable housing

Programme, [Pradhan Mantri Awas Yojana \(PMAY\)](#).

- Thermal comfort through passive cooling technologies in these households could benefit over **11 million urban households and 29 million households in rural areas** that the government wants to construct.
- This would also ensure that the **people most affected by rising temperatures** are not disproportionately affected.
- **District Cooling Systems (DCS):**
 - DCS are centralized cooling techniques **for clusters of buildings** instead of individual buildings, which is much more efficient.
 - District cooling should be made **mandatory for real estate complexes** that are of high density.
 - DCS generates chilled water in a central plant **which can then be distributed to multiple buildings** via underground insulated pipes.
- **Cold Chain and Refrigeration:**
 - It is suggested to use concessional finance from Multilateral Development Banks like the World Bank for investments in **strategies to plug the gaps in the cold chain distribution networks**.
 - Such investments can help **reduce food loss by about 76%** and decrease carbon emissions by 16%.

What is ICAP?

- It seeks to **recognize “cooling and related areas”** as a thrust area of research under the National S&T Programme.
- It is part of India’s national strategy for cooling, whose objective is to reduce country-wide demand for cooling **by 25 % by 2037-2038**.
- It also seeks to reduce cooling energy requirements by 25% to 40% by 2037-38.
- Training and certification of 1,00,000 servicing sector technicians by 2022-23, in synergy with **Skill India Mission**.
- It also makes provision for cooling for Economically Weaker Section (EWS) and Low-Income Group (LIG) housing.
- In line with Montreal Protocol, the plan **emphasizes cutting those elements that deplete the ozone layer**.
- Its goal is to provide sustainable cooling and thermal comfort for all while securing environmental and socio-economic benefits for the society.

[Source: DTE](#)

PDF Reference URL: <https://www.drishtias.com/printpdf/green-cooling-solutions-in-india-by-2040>