India’s way to Net Zero by 2070

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Context : As the effects of **climate change** become more evident, India's commitment to achieving **net-zero carbon emissions by 2070** needs to be both **ambitious** and **sustainable**. The challenge is immense, but it also presents significant opportunities for India to shape a greener and more resilient future.

What is Net-Zero Carbon Emissions?

- **Net-zero carbon emissions** (also known as **carbon neutrality**) refers to the balance between the amount of **carbon dioxide** emitted into the atmosphere and the amount removed from it. The goal is to achieve a situation where **no net carbon emissions** are added to the atmosphere.

- **India's Target**: At the **COP26 Summit** in Glasgow (2021), India announced its goal to achieve **net-zero carbon emissions** by **2070**. This is a significant step in India's long-term climate strategy.

Significance of Carbon Neutrality

1. Climate Change Mitigation:
Achieving net-zero emissions is vital to limit the **average global temperature rise** to **1.5°C** above pre-industrial levels. This is critical to avoid the **severe impacts of climate change**, such as extreme weather events, rising sea levels, and loss of biodiversity.

- **Current Situation**: Global temperatures have already risen by **1°C** since the **1880s** due to the industrial revolution, making the need for urgent action even more pressing.

- **India's Role**: India is currently the **3rd largest emitter of greenhouse gases (GHG)** after **China** and the **United States**. Despite this, India is committed to taking action to reduce emissions and contribute to global climate goals.

2. Biodiversity Protection:
Achieving carbon neutrality helps to reduce **pollution**, conserve **natural habitats**, and protect **biodiversity** by limiting the negative impacts of industrialization on ecosystems.

3. Cleaner Air and Water:
Reducing emissions also decreases **air and water pollution**, leading to improved health outcomes for communities and enhancing the quality of life for people living in polluted environments.

4. Quality of Life:
A transition to a net-zero economy can lead to **sustainable urban development**, creating cleaner, healthier, and more livable communities.

India's Strategy for Achieving Net-Zero

India's approach to achieving net-zero carbon emissions is based on two key principles:

1. **Equity and Climate Justice**: Ensuring that India's climate actions are fair and consider the country's developmental needs, particularly in light of its **historical emissions** and **current socio-economic challenges**.

2. **Common But Differentiated Responsibilities**: Recognizing that while all countries must act to reduce emissions, **developed nations** have historically contributed more to climate change and have greater financial and technological capacity to lead efforts.

Opportunities in Achieving Net-Zero

Transitioning to a net-zero economy presents several **economic and social benefits**:

1. Energy Security:
By diversifying energy sources and reducing dependence on **fossil fuels**, India can improve its **energy security** and reduce vulnerabilities related to global energy supply disruptions.

- India currently ranks **4th globally** in terms of **renewable energy capacity**, with **solar** and **wind** energy playing a critical role in the country's energy mix.

2. Employment Generation:
The shift to a green economy can create **new employment opportunities** in emerging industries like **renewable energy**, **green infrastructure**, and **carbon capture and storage (CCS)**.

3. Environmental Protection:
By adopting net-zero strategies, India can play a key role in protecting the environment by **responsibly using natural resources** and **minimizing environmental degradation**.

4. Attracting Investment:

Investors are increasingly considering **environmental, social, and governance (ESG)** factors in their decisions. India's commitment to net-zero can attract **green investments** and stimulate innovation in sustainable technologies.

Challenges in Achieving Net-Zero

While the benefits are clear, India faces significant challenges in achieving net-zero carbon emissions:

1. Resource Limitations:
India's large population and **limited resources** pose challenges in scaling up renewable energy projects. The country will need substantial land and infrastructure for the expansion of **solar** and **wind** energy.

2. Financial Constraints:
Achieving net-zero will require **massive investments** in renewable energy, technology, and infrastructure development. The **cost of decarbonizing** sectors like **agriculture**, **cement**, and **steel** will be high.

3. Technological Gaps:
India's limited access to **advanced green technologies** hinders its progress toward net-zero. Overcoming this gap will require innovation and international cooperation.

4. Dependence on Fossil Fuels:
India still derives around **50% of its energy needs** from **coal**, making the transition to renewable energy a major challenge.

5. Growing Energy Demand:
India's **power demand** is expected to increase by **nine to ten times** by 2070. Meeting this demand entirely with renewable energy will require **5,500 GW of solar** and **1,500 GW of wind capacity**, which is a monumental task.

6. Inequality:
The impacts of climate change disproportionately affect the **economically weaker sections** of society. According to the **World Inequality Database**, the **top 10% of emitters** in India contribute **20 times more emissions** than the poorest 10%.

Sustainable Path for Achieving Net-Zero

India's path to net-zero must be **sustainable**, balancing economic development with climate action. Some key measures include:

1. Energy Efficiency:
Promoting the use of **energy-efficient appliances** and adopting **passive design strategies** in buildings can reduce energy consumption and lower carbon emissions.

- **Passive design** uses a building's natural surroundings to improve **indoor comfort** and reduce the need for **heating and cooling**, thus cutting energy costs.

2. Sustainable Transport:
Encouraging the use of **public transportation**, **electric vehicles**, and **railways** can significantly reduce emissions, especially in urban areas.

3. Mindful Consumption:
Encouraging the use of **locally produced goods** and promoting **mindful dietary choices** can reduce the carbon footprint from transportation and agriculture.

4. Policy Measures:
Scaling up **renewable energy** production through supportive policies and addressing bottlenecks in policy execution will help accelerate the transition to a net-zero economy.

- The **PM Surya Ghar Muft Bijli Yojana**, which promotes **rooftop solar installations**, is an example of decentralizing energy production and reducing dependence on fossil fuels.

5. Renewable Energy Adoption:
India must focus on expanding its capacity in **solar**, **wind**, **hydropower**, and **biomass** energy through continued investments and **budgetary allocations**.

6. Carbon Markets:
Standardizing and expanding **carbon markets** can provide financial incentives for businesses and individuals to engage in climate-friendly practices.

7. Nuclear Energy:
Expanding **nuclear power** can provide a reliable, low-carbon energy source to complement renewable energy sources.

8. Innovative Technologies:
Investing in **energy storage** and **smart grid technologies** will increase the efficiency and reliability of renewable energy systems.

9. International Cooperation:
To tackle global challenges, international collaboration is crucial. India must continue working with other nations to **address climate change** and **achieve sustainable development goals (SDGs)**.

What Lies Ahead?

To ensure a **sustainable future**, India must:

- Address **inequity** in climate action to achieve **sustainable development** across all sectors.
- Explore **alternative funding options** for green infrastructure projects.
- Balance the transition to **green energy** with the **upliftment of poverty** among the economically vulnerable.
- Ensure that **economic growth** and **environmental responsibility** go hand in hand.

By embracing these strategies, India can achieve **net-zero carbon emissions by 2070** and lead the way towards a more sustainable, resilient, and prosperous future.