# India at Global Clean Energy Action Forum

**For Prelims:** Clean Energy, Biofuels, International Groupings & Forums, Government's Initiatives

**For Mains:** Advantages of Biofuels, Government efforts for sustainable biofuels, International forums for clean energy

## Why in News?

Recently, at the **Global Clean Energy Action Forum-2022** at Pittsburgh, Pennsylvania in the United States, India's representative has said that "sustainable biofuels **play a key role to reduce** GreenHouse Gas (GHG) emissions **from the transport sector."**

## What do we need to know about the Global Clean Energy Action Forum 2022?

- **About:**
  - The US, for the first time, hosted **Global Clean Energy Action Forum**, a joint convening of the **13th Clean Energy Ministerial (CEM 13)** and the **7th Mission Innovation Ministerial (MI-7)**, from 21st to 23rd September 2022.
- **Theme:**
  - The theme for CEM13/MI-7 is **Rapid Innovation and Deployment**.
    - This means **accelerating the pace and scale of innovation** through collaboration and shared strategies for the **deployment of** clean energy technologies.
- **Objectives of the Forum:**
  - Define **international clean energy leadership and collaboration** in 2022 through an interactive, inspiring, and impactful event spotlighting global leaders fulfilling their climate pledges.
  - Focus on actions that deliver a low-cost**, zero-emissions energy future** that provides opportunities for all, especially good-paying jobs.
  - Demonstrate progress in moving along the **innovation-to-deployment continuum** at an unprecedented pace and scale to meet climate goals, and to innovate with a purpose.
- **India's Stand at the Forum:**
  - **At International Collaboration to Accelerate Clean Energy:**
    - India has reported **establishing 5 Bioenergy Centers** with an interdisciplinary team working on advanced sustainable biofuels using modern biotechnology tools.
    - In April 2022, India hosted the **Mission Innovation Annual Gathering** at New Delhi, the **Mission Integrated Biorefineries** was launched by Co-leads India and Netherlands, uniting key members to accelerate innovation for renewable fuels, chemicals, and materials for a low-carbon future.
  - **At India Clean Energy Showcase:**
    - India, being one of the founding members of the **Clean Energy Ministerial (CEM)** will be hosting **CEM-14 in 2023 in Bengaluru** along with its Presidency of G-20 in the same year.
  - India is among the few countries in the world to design a **Cooling Action Plan (CAP)** with

a long-term vision (spanning a 20-year period from 2017-18 to 2037-38) that addresses **cooling requirements across sectors.**
    - India has committed to an ambitious **Nationally Determined Contributions (NDCs)** of reducing emission intensity **by 33-35% in 2030** against the levels of 2005.
    - India is implementing the largest Renewable Energy **(RE) expansion program** in the world envisaging a **5-fold increase in the overall RE capacity** in the country from 32 GW in 2014 to 175 GW by 2022, and further to 500 GW of renewable power in the country by 2030.

## What is the Clean Energy Ministerial and Mission Innovation Ministerial?

- **Clean Energy Ministerial:**
    - **Establishment:**
        - It was established in December 2009 at the UN's Framework Convention on Climate Change conference of parties in Copenhagen.
    - **Purpose:**
        - CEM is a **high-level global forum to promote policies and programs** that advance **clean energy** technology, to **share lessons learned and best practices,** and to encourage the transition to a global clean energy economy.
    - **Focus Areas**:
        - The CEM is focused on **three global climate and energy policy goals:**
            - Improve energy efficiency worldwide.
            - Enhance clean energy supply.
            - Expand clean energy access.
    - **Members:**
        - 29 countries are part of CEM.
        - India is also a member country.
- **Mission Innovation Ministerial:**
    - **About:**
        - Mission Innovation (MI) is a **global initiative catalysing a decade of action and investment** in research, development and demonstration to make clean energy affordable, attractive and accessible for all. This will accelerate progress towards the Paris Agreement goals and pathways to net zero.
    - **Mission:**
        - Zero-Emission Shipping
        - Green Powered Future
        - Clean Hydrogen
        - Removal of Carbon Dioxide
        - Urban Transitions
        - Net Zero Industries
        - Integrated Biorefineries

## What are Biofuels?

- **About:**
    - Any **hydrocarbon fuel** that is produced from an **organic matter** (living or once living material) in a **short period of time** (days, weeks, or even months) is considered a **biofuel.**
    - Biofuels may be **solid, liquid** or **gaseous** in nature.
        - **Solid:** Wood, dried plant material, and manure
        - **Liquid:** Bioethanol and Biodiesel
        - **Gaseous:** Biogas
    - These can be used to **replace or can be used in addition to diesel, petrol or other fossil fuels** for transport, stationary, portable and other applications.
        - Also, they can be used to generate heat and electricity.
    - Some of the main reasons for shifting to biofuels are the **rising prices of oil**, **emission of greenhouse gases from fossil fuels** and the interest in **obtaining fuel from agricultural crops** for the benefit of farmers.
- **India's Initiatives for Sustainable Biofuels:**

    - **Pradhan Mantri JI-VAN Yojana, 2019**
    - **Ethanol blending**
    - **GOBAR (Galvanizing Organic Bio-Agro Resources) DHAN scheme, 2018**
    - **Repurpose Used Cooking Oil (RUCO)**
    - **National Policy on Biofuels, 2018**
- **Initiatives under 5 Bioenergy Centers:**
    - **"DBT Pan IIT Center for Bioenergy" have developed engineered thermostable and glucose tolerant β-glucosidase.**
    - **DBT –ICGEB Bioenergy Centre** has developed Cellulase Enzyme Technology for 2G Ethanol Production and it' under scale-up.
    - **DBT-Indian Oil Cooperation Limited Bio-energy Centre**, Faridabad has evaluated a process for conversion of biomass to ethanol utilizing the glycan hydrolases developed at the Centre in a demonstration plant (10 tons biomass per day) that is under construction.
    - **DBT-ICT Centre for Energy Biosciences** aims Biological and Chemical transformations for generating commercially viable technologies for adding value to waste.
    - **DBT-TERI Bioenergy Research Center** is exploring actively on development of clean technologies for production of advanced biofuels; biodiesel, biohydrogen, pyrolytic bioil, using algae biomass as next generation feed.

## UPSC Civil Services, Previous Year Questions (PYQ)

**Q. It is possible to produce algae based biofuels, but what is/are the likely limitation(s) of developing countries in promoting this industry? (2017)**

1. Production of algae based biofuels is possible in seas only and not on continents.
2. Setting up and engineering the algae based biofuel production requires high level of expertise/ technology until the construction is completed.
3. Economically viable production necessitates the setting up of large scale facilities which may raise ecological and social concerns.

**Select the correct answer using the code given below:**

**(a)** 1 and 2 only
**(b)** 2 and 3 only
**(c)** 3 only
**(d)** 1, 2 and 3

**Ans: (b)**

**Explanation:**

- Bio-fuels are an alternative to conventional fuels; they are liquid or gaseous fuels, primarily produced from biomass, and can be used to replace or in addition to diesel, petrol or other fossil fuels for transport, stationary, portable and other applications.
- Third generation bio-fuels are produced from microorganisms like algae. Other than seas, algae can be cultivated in diverse ways, such as in open ponds, closed-loop systems and phytobioreactors. Hence, 1 is not correct.
- One of the major limitations of producing 3rd generation algae based bio-fuel is that it is technology intensive and the development of bioreactors is a costly exercise because all current technologies require heavy expertise and technological development which can make the algal bio-fuel production unviable. Hence, 2 is correct.
- In addition to this, setting up of large scale facilities for the production of bio-fuel itself may require land (forest and agricultural land) and other resources which may raise ecological and social concern. Hence, 3 is correct.
- Therefore, option (b) is the correct answer.

**Q. According to India's National Policy on Biofuels, which of the following can be used as raw materials for the production of biofuels? (2020)**

1. Cassava
2. Damaged wheat grains
3. Groundnut seeds
4. Horse gram
5. Rotten potatoes
6. Sugar beet

**Select the correct answer using the code given below:**

**(a)** 1, 2, 5 and 6 only
**(b)** 1, 3, 4 and 6 only
**(c)** 2, 3, 4 and 5 only
**(d)** 1, 2, 3, 4, 5 and 6

**Ans: (a)**

**Explanation:**

- The National Policy on Biofuels, 2018, allows production of ethanol from damaged food grains like wheat, broken rice, etc., which are unfit for human consumption.
- The Policy also allows conversion of surplus quantities of food grains to ethanol, based on the approval of the National Biofuel Coordination Committee.
- The Policy expands the scope of raw material for ethanol production by allowing use of sugarcane juice, sugar containing materials like sugar beet, sweet sorghum, starch containing materials like corn, cassava, damaged food grains like wheat, broken rice, rotten potatoes, unfit for human consumption for ethanol production. Hence, 1, 2, 5 and 6 are correct.
- **Therefore, option (a) is the correct answer.**

**Source: PIB**