IEA Bioenergy

**IEA BIOENERGY TECHNOLOGY COLLABORATION PROGRAMME (IEA BIOENERGY TCP)**

**STRATEGIC PLAN 2020-2025**

**Introduction**: The IEA Bioenergy TCP was originally established in and has been operating since 1978. This sixth Strategic Plan covers the period from 1 March 2020 to 28 February 2025 and is an element in the Request for Extension process for a new five-year term beginning on the 1 March 2020.

**Mission of IEA Bioenergy**: The mission of the IEA Bioenergy TCP is to increase knowledge and understanding of bioenergy systems in order to facilitate the commercialisation and market deployment of environmentally sound, socially acceptable, and cost-competitive, low-carbon bioenergy systems and technologies, and to advise policy and industrial decision makers accordingly. The IEA Bioenergy TCP realises the mission by providing platforms for international collaboration and information exchange in bioenergy research, technology development, demonstration, and policy analysis—including through network development, information dissemination, and the provision of science-based analysis and advice.

**Context for Strategic Plan**: Bioenergy is the main source of renewable energy today, contributing to energy used in power generation, heat for industry and buildings, and fuel for transport. Context for the development of the Strategic Plan includes the Paris climate accord within the United Nations (UN) Framework Convention on Climate Change (UNFCCC), the UN Sustainable Development Goals, the continuing importance of security of energy supply, the IEA *Technology Roadmap: Delivering Sustainable Bioenergy* (2017), and the deployment of modern renewable energy in emerging and developing economies. In this context, there are significant opportunities for the IEA Bioenergy TCP to seize, but also challenges to address.

The key challenge is that there is an urgent need to accelerate the contribution of bioenergy across all sectors—most notably in the transport sector where consumption must triple by 2030.[1] The opportunities for bioenergy include its important role in:

- Reducing greenhouse gas emissions and improving the global carbon balance
- Limiting global temperature rise (as agreed to in the Paris accord)
- Transitioning to a low-carbon, energy-secure economy with an increased focus on the circular economy, cascading use of renewable materials, and the biobased economy
- Integrating growing shares of variable renewable energy into energy systems.

Interaction and collaboration with other new and existing international organisations to promote and accelerate bioenergy is also critically important. The evolving global energy landscape offers an opportunity and an obligation from the IEA Bioenergy TCP to develop and introduce bioenergy as low-carbon and clean energy, within an increasingly renewable energy system, while doing so sustainably.

**Objectives of the Plan**: The objectives of the plan are to enable bioenergy to substantially contribute to future global energy demand within a growing global bioeconomy; provide significant greenhouse gas savings across all energy sectors; and contribute to the Sustainable Development Goals. Bioenergy can and must deliver increasing results in decarbonising transport, heat, power and electricity, including through its capacity to deliver negative emissions by, among many pathways, bioenergy with carbon capture and storage/utilisation (BECC/BECCUS).

In the Strategic Plan, the IEA Bioenergy TCP will focus on the following:

- Development of the global opportunities for increased sustainable biomass production in agricultural and forestry systems, as well as sustainable landscape management
- Establishment of sustainable and efficient biomass supply chains based on transparent, science-based criteria
- Decarbonisation potential for bioenergy for its capacity to deliver negative emissions.
- Development and application of innovative technologies, partnered with existing ones, designed to meet the commercial needs of the evolving global market in the heating, electricity, and transportation sectors.

The IEA Bioenergy TCP will engage all relevant stakeholders in a dialogue to help shape the actions of the TCP; expand outreach to emerging and developing countries; and enhance and optimise communication channels to disseminate outputs to policy makers, decision makers, and the wider stakeholder community.

1 IEA *Technology Roadmap: Delivering Sustainable Bioenergy* (2017)

**Actions**: Key actions to achieve the objectives of the Strategic Plan are presented in four areas.

1. **A sustainable system for bioenergy and biomass materials supply**

   Demonstrating the key role of bioenergy in a decarbonising world:

   - Develop and explore the complementary roles of bioenergy and other renewable energy supply, the potential of bioenergy carbon capture and storage or utilisation, and the pricing of these specific functions

   Embedding bioenergy into the broader bio-economy:

   - Enable the transition to a low-carbon, energy-secure economy and broaden recognition that bioenergy systems are common components in value chains or production processes that also produce food and other biobased products (e.g., at biorefineries)

   Incorporating the security, flexibility, and stability provided by bioenergy in the fuels, electricity, gas and heating systems:

   - Enable baseload and just-in-time production of bioenergy for different energy grids and renewable energy systems
   - Gradually enable the greening of the natural gas grid

2. **Innovative Technologies**

   Enabling the development and application of innovative technologies:

   - Ensure that Task networks serve as the basis for enabling collaboration and information exchange to catalyse commercialisation with industry
   - Showcase best practices to enable deployment

   Developing Advanced Biofuels for Mobility

   - Stimulate the development of biofuels from lignocellulosic biomass and wastes and consider the role of biofuels in sectors that require high energy-density fuels (e.g., aviation, marine, and long-distance transport)

3. **Sustainable Supply Chains**

   Developing sustainable biomass supply chains:

   - Incorporate effects of land use (change) and landscape management in the analysis of supply chains
   - Facilitate the reclamation and reuse of abandoned agricultural land and the use of fallow land
   - Enable increased production of biomass in a sustainable way in agriculture and forestry, while maintaining or improving carbon storage and sequestration
   - Stimulate the development of logistics to harvest under-used residues
   - Support certification to prove sustainability of supply chains
   - Promote the market deployment of viable and efficient biobased value chains

4. **Operational Optimisation**

   Engaging all relevant stakeholders in a dialogue:

   - Collaborate closely with other international agencies, IEA TCPs, and/or actions in this area
   - Organise workshops with international institutes, governments, NGOs, and industry
   - Proactively provide timely science-based analyses to inform political/public debates

   Expanding the outreach to emerging and developing countries:

   - Realise increased membership to support outreach
   - Work closely with other international organisations to enhance outreach

   Ensuring the optimal use of communication channels:

   - Continue with a well-functioning website as the central channel, and improve the TCP's outreach through social media

**Outcome of Strategic Plan**: Fulfilling the objectives of the Strategic Plan will result in bioenergy producing a critical and ever-increasing contribution to the future global energy paradigm, in harmony with the broader biobased economy, while delivering greenhouse gas savings across all energy sectors.

1 IEA *Technology Roadmap: Delivering Sustainable Bioenergy* (2017)