Renewables Global Status Report (GSR) Collection 2023

Agriculture Module Factsheet

What are the main takeaways of this report?

- Multiple crises – including the climate emergency and the energy crisis, along with associated inflation and higher energy prices – have played a **key role in increasing demand for renewable energy** in four sectors: buildings, industry, transport and agriculture.
    - Interest in **energy efficiency and renewables** increased across these sectors as a way to cut costs and enhance energy supply.
- The crises pushed countries to enact **key policy frameworks for renewable energy**.
    - If adequately backed by policy frameworks and political will, renewables have the potential to respond to crises by providing the **most reliable and cheapest energy option** to supply buildings, industries, transport and agriculture.
- The main barrier to renewable energy uptake in these demand sectors is the **ongoing support for fossil fuels from governments and multilateral development banks**.
    - These institutions provide subsidies and continued investment for new fossil fuel projects despite clear signals from the scientific community that this is incompatible with a pathway to keep global temperature rise within 1.5 degrees Celsius, as pledged in the Paris Agreement.
- In 2022, the United States announced the **Inflation Reduction Act** (IRA), allocating USD 433 billion in new spending and tax credits, of which USD 370 billion is dedicated to energy security and climate change for the next 10 years.
- The European Commission advanced its **REPowerEU** plan to curtail the effects of the disruption of the energy markets caused by the Russian Federation's invasion of Ukraine.
    - To reduce the European Union's reliance on Russian gas, REPowerEU sets policies and objectives for energy efficiency, as well as specific renewable targets and initiatives such as a solar rooftop initiative requiring the installation of renewables in new buildings.
    - REPowerEU also establishes an EU solar strategy to double solar photovoltaic (PV) capacity by 2025 and install 600 gigawatts of solar by 2030. In addition, it calls for a doubling of heat pump deployment and the integration of solar thermal and geothermal in district heating.
    - A key REPowerEU objective is to reduce fossil fuel use in industry and transport.
- Momentum towards **net zero greenhouse gas emissions** is driving policies.
    - As of 2022, a total of 140 countries, representing 90% of global emissions, had committed to a net zero pathway, up from 130 countries representing 70% of emissions in 2021
- Because sectors have responded differently to crises, renewables **uptake across sectors varies widely**.
    - Policies must bring together the different sectors to avoid a siloed transition to renewables and to improve co-ordination among sectoral and energy policies.
- **Why is this report focused on demand – that is, the energy-consuming sectors?**

- Understanding trends on the demand side is critical because it helps **identify energy needs** across sectors and **advance progress** in the uptake of renewables – thereby speeding the energy transition.
- The energy transition involves different building blocks, **not only energy supply**, which typically dominates the narrative.
- This report provides evidence of the key role that energy-consuming sectors play in advancing the **structural transformations needed** for a full transition to renewables.
- REN21 decided to structure the GSR 2023 collection to bridge both angles – supply and demand – and will soon release a module on energy supply.

How did the sector respond?

- The agriculture sector contributes USD 4.2 trillion to the **global GDP** and employs over a quarter (26%) of the world's workforce.
- In 2020, agriculture and forestry accounted for around 3% of the world's **total final energy consumption**.
- Energy use in agriculture, fisheries and aquaculture contributed around 1 gigatonne of **CO_2-equivalent emissions** in 2020, including direct emissions from burning fossil fuels and indirect emissions from electricity generation. Emissions from these sectors have increased over the past two decades.
- Lack of access to a reliable power grid has driven farmers to **embrace renewable alternatives**.
- Off-grid **renewable cooling technologies** have helped reduce massive post-harvest losses, allowing farmers to expand their market reach and gain power in price negotiations
    - India is among the countries using solar-powered cold storage to reduce food waste and enhance energy efficiency.
    - Improving the **energy efficiency** of food cold chains – including through the use of fridge insulation, efficient compressors and better controllers
- There is vast opportunity to use renewables in **food processing, solar water pumping and solar thermal energy** to heat greenhouses.
    - India has adopted distributed renewable energy applications to address energy needs in the food chain.
    - Turkey has eased rules for small-scale solar systems, exempting solar irrigation projects from permitting requirements.
- The most popular policies for renewables in the agriculture sector are **financial incentives** such as subsidies and tax credits, in addition to **funding programmes**.
- By the end of 2022, a total of 26 national and sub-national jurisdictions had **renewable energy policies for agriculture**, led by efforts in the United States, India and Bangladesh.
- Increasingly, farmers and agricultural suppliers are investing in solar thermal and other renewable energy projects as a way to alleviate the effects of rising fossil fuel prices and to protect against price volatility and supply shocks.

- **Geothermal energy** allows farmers to grow crops in difficult environments and to increase food availability and yields through greenhouse and soil heating, food drying, sterilisation, refrigeration, milk pasteurization and irrigation.
    - In Türkiye, USD 10 million was invested in geothermal energy during 2021-2022 to support a drying facility and soil-less greenhouses.
- The use of **biogas**, such as methane, in agriculture doubled during 2010-2020, while the use of **liquid** biofuels grew 9.4 times.