

Twelfth session of the IRENA Assembly

Ministerial Meeting on Renewable Energy for Adaptation: A Water-Energy-Food Nexus Perspective

14 January 2022, 11:00 – 13:00, Room A1
St. Regis Hotel, Saadiyat Island, Abu Dhabi

Background

Adaptation and mitigation must join forces in the global fight against climate change and for a just and inclusive energy transition. While the role of renewables in mitigating climate change and achieving the 1.5C target is well-known, the opportunities they offer for adaptation strategies are often overlooked. Renewables-based solutions either can be directly targeted at adaptation or they can increase resilience and decrease vulnerability as a co-benefit, in particular in the water-energy-food nexus.

In the energy sector, the growth of renewables brings significant adaptation-related benefits. Distributed solutions strengthen the resilience of electricity systems, particularly in the face of extreme weather events and for vulnerable communities presently living with limited or no modern energy access. The growth of renewables, such as solar PV and wind, also enhance resilience of supply by reducing reliance on freshwater for electricity generation. Solar PV and wind technologies are significantly less-water intensive than thermal generation, thus freeing up increasingly constrained water resources. IRENA's analysis of Nationally Determined Contribution (NDC) commitments of China and India finds that a scale-up of renewable power, particularly solar PV and wind, combined with improved cooling technologies, could reduce the water withdrawal intensity of electricity generation by 42% and 84% by 2030, respectively. As climate change accelerates, adaptation strategies must also tackle vulnerabilities within renewable energy solutions, including hydropower and bioenergy. Diversification of the energy mix with non-hydro renewables and integrated approaches (e.g., agri-voltaics) can help overcome some of the climate-induced challenges.

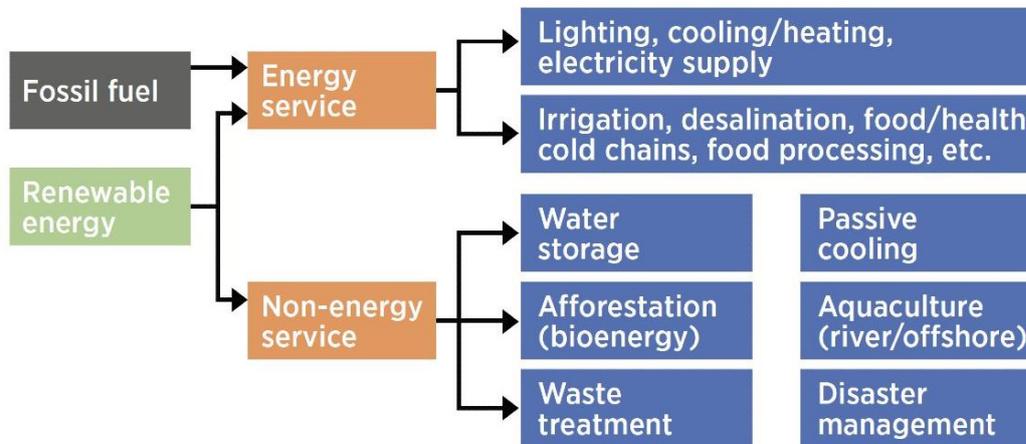
Renewable energy applications for adaptation go well-beyond the energy sector, as many climate adaptation strategies lead to additional energy demand. For example, changing rainfall patterns and depleting freshwater resources require greater investments in energy-intensive irrigation, desalination and water conveyance infrastructure. A changing climate is also raising energy demand for heating/cooling affecting habitation spaces (e.g., homes, offices) and commodity supply chains (e.g., for perishable agriculture produce, vaccines). It is estimated that over 3.4 billion people still face cooling access challenges globally. Renewables are, therefore, necessary to keep adaptation measures in sync with greenhouse gas mitigation targets.



Renewables simultaneously advance climate goals and Sustainable Development Goals linked to energy, water and food security, as well as poverty alleviation. IRENA’s analysis reports that solar irrigation solutions could lower emissions and increase resilience to changing rainfall patterns, while also raising farmer incomes by 50% or more in India compared to rain-fed irrigation by enabling multiple cropping cycles during a year. Furthermore, access to renewables-based processing and cold storage could increase added value, reduce losses, and improve market access for farmers and agri-enterprises, thus improving adaptive capacity to shocks. To this end, IRENA and FAO are co-leading an Energy Compact on ‘Energizing Agri-food Systems with Renewable Energy’ to facilitate the adoption of renewables in the agriculture sector. Improved energy access with renewables in rural areas can also support livelihoods diversification, enabling individuals to pursue income-generating activities across a range of sectors.

Renewables, thus, should and can play an important role in the adaptation- energy- water and food nexus, with spillover effects across many other parts of society and economy (Figure 1). This makes it necessary to adopt a holistic approach to understanding and estimating the true value of renewables for adaptation. The evidence base on the impacts of renewables on adaptation remains largely anecdotal and needs to be strengthened to guide decision-making and investments. Adaptation also needs to be mainstreamed into all policy areas (e.g. energy, water, agriculture). In this context, IRENA offers technical assistance to countries in the design and implementation of climate action plans, integrating renewables both as mitigation and adaptation measures.

Figure 1 Multifunctional aspects of renewable energy contribution to climate change adaptation



Source: IRENA

Objectives

The Ministerial will shed light on the important yet under-recognised benefit of renewables for climate change adaptation. Members will have the opportunity to showcase their experiences on the adaptation benefits associated with renewables and measures needed to attract adaptation-linked financing for such solutions.

The Ministerial will also convene experts from international organisations, practitioners and financing institutions to share practical lessons and insights on adaptation impacts of renewables and actions needed to better capture the benefits.



Against the backdrop of the High-Level Dialogue on Energy and COP26, the Ministerial will also be an opportunity for governments and stakeholders to showcase new partnerships and initiatives for the implementation of Energy Compacts, NDCs and other commitments related to renewable energy and adaptation.

This Ministerial will broaden awareness and knowledge of what is needed for maximising the adaptation benefits of renewables by sharing good practices and lessons from around the world. It will also highlight the importance of solutions that link climate mitigation and adaptation objectives with the broader 2030 Agenda for Sustainable Development.

The outcomes of the meeting will inform the Agency's further work on strengthening the knowledge base on the adaptation impacts of renewables, particularly in the cross-sectoral context. It will also guide IRENA's offerings to provide concrete support to its Members to better reflect the role of renewable energy in adaptation strategies and mobilise capital for such projects.

Guiding Questions

- What opportunities do renewable energy solutions offer for your country's adaptation strategies to climate impacts across the energy, agriculture and water sectors?
- What are the key enabling conditions for attracting investments, including climate financing, in renewable energy projects that offer significant adaptation benefits?
- What policy measures have proven to be effective in mobilising stakeholders across sectors to collaboratively design and implement adaptation measures, including renewable energy?
- How can IRENA strengthen its support to its Members in mainstreaming renewable energy within national adaptation strategies and its implementation, including through IRENA-led Energy Compacts (e.g., on Energizing Agri-food Systems with Renewable Energy with FAO)?

Associated Publications

- [Bracing for climate impact: Renewables as a climate change adaptation strategy](#) (2021)
- [Renewable energy for agri-food systems – Towards the Sustainable Development Goals and the Paris Agreement](#) (2021)
- [Climate Action with Renewables: Enhancing Nationally Determined Contributions](#) (2021)
- [Accelerating geothermal heat adoption in the agri-food sector: Key lessons and recommendations](#) (2019)
- [Water Use in India's Power Generation: Impact of Renewables and Improved Cooling Technologies to 2030](#) (2018)
- [Water Use in China's Power Sector: Impact of Renewables and Cooling Technologies to 2030](#) (2016)
- [Solar Pumping for Irrigation: Improving livelihoods and sustainability](#) (2016)
- [Renewable Energy Benefits: Decentralised solutions in the agri-food chain](#) (2016)



- [In focus: Complementarity between hydropower and other renewable generation technologies \(Renewable Energy Market Analysis: Latin America\) \(2016\)](#)
- [Renewable Energy in the Water, Energy and Food Nexus \(2015\)](#)

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