



United Nations



HIGH-LEVEL DIALOGUE ON
ENERGY
UNITED NATIONS, NEW YORK, SEPTEMBER 2021

High Level Dialogue on Energy

Technical Working Group 4: Innovation, Technology and Data

Annotated outline¹

1. Goal (500-1000 words, present the overall goal and targets for the Theme, setting clear ambition in support of the 2030 Agenda and the Paris Agreement.)

The report examines the application of technology, Innovation and data to accelerate progress on SDG7 targets and net-zero goals by 2050. In doing so, the report aims at

- Identifying opportunities and gaps in technology, innovation and data policies to drive the achievement of SDG 7 by 2030, and net-zero emissions by 2050. This section will focus on the technologies and innovations that will make the biggest impact on energy access, just transition, EE targets and the clean energy transition by 2030 and the longer-term climate goals by 2050.
- Documenting best practices that illustrate the key role of innovation and data in fostering the implementation of SDG 7 targets in relation to energy efficiency and renewable energy in countries and cities of different size and context.
- Presenting a set of *clear recommendations to effectively leverage innovation, technology and data* to achieve a just transition focusing on the priority actions and pre-conditions needed to create the enabling conditions (policy, capacity, investment etc.) and solutions to scale up to accelerate progress; for both national action and international cooperation. The recommendation will address where do we need to focus our innovation and development spending? and what evidenced data will be needed for decision makers to allocate more resources on clean energy generation, energy efficiency and productive uses of energy?

2. Context (1000 - 2000 words, state of the sector assessment, providing background and current landscape of the thematic area).

2.1. Technology and Innovation to get us to 2030 and 2050:

Innovation in technology has brought about a huge transformation in the energy sector over the past decade with good progress visible in the power sector. At the same time, there is a need to shift innovation priorities to address the intersection with end-use sectors like industry, transport and food systems where progress is more challenging and not therefore keeping pace with the 2030 development agenda and the net zero targets by 2050.

¹ Draft annotated outline for review by TWG Members. Made available on 15 March 2021.

To broaden the scope and applicability of technologies, we need to move towards a multi-prong approach covering sector, technology and geography. This includes for example,

- Decarbonizing power systems: Power and electrification, transmission and distribution, storage (Managing intermittence, renewable integration, enabling technologies like batteries, smart infrastructure)
- Electricity for the last mile (distributed energy, clean cooking)
- Disruptive changes we see in how energy is used and delivered in end use sectors (transport, industry, food systems, buildings taking into account efficiency, renewables, fuels and circularity, heating and cooling) (cities and regions, corporates)
- Digital technologies are influencing the speed and scale for the technology deployment and forcing the stakeholders to rethink the governance arrangements (Geographic Information Systems, advanced analytics, Artificial intelligence and machine learning)

Technology innovation must be accompanied by innovation in finance and social innovation, including disruptive business models. These types of innovations are briefly discussed in turn.

2.2. Financial innovations

Conventional financing solutions have proven their limitations in addressing challenges of the energy transition particularly for the poor. On the other side, financial innovation that integrates the use of digital currency proved to be very effective in resolving challenges related to energy access in rural and remote areas. Financial innovation models being considered include;

- PAYG
- Rent to own appliance models
- Microfinancing, financing through cooperatives and self-help groups
- Vouchers and cash transfers for the poorest of the poor

2.3. Social Innovations

The energy transition cannot be achieved relying solely on technological innovation, as the uptake and use of these innovations require new mindsets towards energy, new ways of organizing and governing energy supply and energy systems. Consideration should be given to the socio-economic and cultural context in which the energy innovation is occurring to full ensure key groups are empowered and there is not a disconnect between the government and private sector responses. Conversely, technological innovations enable social innovations such as peer to peer trading enabled through blockchain and the participation in local energy collectives

Examples of types of social innovations in energy.

- Community Energy
- Peer to peer energy trading
- Energy cooperatives

2.4. Data availability and data systems

Data is a prerequisite for making evidence-based decisions and planning, monitoring trends, and tracking progress toward policy goals (e.g. SDG 7). It is also essential in guiding investments. There is a need to improve data systems that help addressing data gaps to serve underserved. At the same time, data needs to be sensitive and nuanced to capture the range of stakeholders involved in energy ecosystems as well as to ensure the impact on beneficiaries is achieved, especially those who might fall into vulnerable categories or live in remote or informal parts of cities and countries.

The need for reliable and up to date data is critical for better policy and technological solutions. While the need for new data is critical, we should also make use of existing data for planning and designing.

- GIS data, real time google map and metrological data – used to inform sectoral development plans, energy planning for smart cities and energy planning to improve energy access planning and monitoring.
- Big Data, Artificial Intelligence and Internet of Things – to improve energy analytics and drive more energy efficiency.

This section will provide a list of the sources of available data that can be used for better planning, design for low carbon energy development and improved energy efficiency.

Challenges (2000 words, critical barriers to progress by theme)

The Policy regime governing the energy sector is outdated and often favors fossil fuels through provision of subsidies, that are often not available for renewable energy or energy efficiency. We need to work collectively to reform policies to support achieving the 2030 development goals and the long-term climate goals for 2050. The challenges can be broadly pooled around conducive policies, skills, absence of coordination, absence of data and data systems. The section will examine:

- Weak business case for energy efficiency and other technologies in the presence of subsidies
- Infrastructure gaps taking note of different geographies and capabilities, equal access to knowledge and infrastructure hence the need to address enabling infrastructure for all
- Capacity and skills gap- Key consideration to avoiding the digital divide and turning the digital economy into an opportunity to create jobs
- Silos approach and the need for a more integrated approach and coordination among various stakeholders,
- The systemic nature of innovation and the need to evolve social and political institutions to drive innovation in policy, governance and behaviors taking note of local contexts and needs and involving people in the change,
- Limited data availability, disclosure principles, systems to support reporting, costs of data collection

3. Recommendations/Plan of action (5000/6000 words, a proposed menu of solutions and policy options)

Finance for R&D and innovation - Despite the radical and disruptive evolution of the energy system, many technologies are not yet there, are not affordable and many key stakeholders,

including governments are not equipped with the systems, infrastructure, financing or expertise to take advantage of them. There are therefore clear signals that we need to channel more resources into research and development to deliver the technologies needed to decarbonize sectors like shipping and heavy industry, drive down the costs of technologies and build consumer confidence in upcoming innovations. While countries with research capabilities will take the lead, how can the innovation ecosystem address the uneven access to technology and drive homegrown innovation. Resources are also required to support stakeholders to strengthen their governance systems and the skills of key actors to engage with the technology opportunities.

Foster inter-sectoral linkages - Innovations in technologies and data happen in socio-political contexts, and systems and institutions need to rapidly evolve to leverage the opportunities and address the challenges and be cognizant of the nuances and multi-layered dimensions of energy systems to ensure all key stakeholders are engaged in the solutions which reach the key target audience, including vulnerable groups. Therefore ensure that inter-sectoral linkages are adequately reflected in energy transition policy, as well as water, agriculture, and environment-related policies, in order to ensure integrated solutions that are sustainable in the long term and meet the needs of those who could benefit most from the innovation.

Context specific policies - Consider the context at hand in order to develop a stable and supportive enabling environment, including supportive policies and plans (e.g. [Morocco's Plan Vert](#)), regulations (e.g. [small power guidelines in Tanzania](#)), and institutional support (e.g. rural electrification agencies), while ensuring flexibility and openness of policy frameworks to support varied food-energy schemes. Rural communities should be adequately consulted in these processes;

Partnerships - There is increasing realization that partnerships between different types of energy chain actors brings them mutual benefits and ensures more viability and sustainability. These include public-private sector partnerships and arrangements involving them and energy communities.

The emerging role of energy as a service - Get out of the energy box by deigning energy services around productive use of energy (PUE), not just energy supply. This would mean that (i) energy suppliers should build PUE costs, activities and partnerships into their project designs and/or business models, (ii) tariffs should be made affordable to energy users and (iii) integrating PUE into existing local value-chains.

4. Impacts (1000-2000 words, assessment of the catalytic impacts from the proposed recommendations on SDG7 and net-zero 2050)

- Delivering the technologies needed to achieve the SDG7 and the net-zero goals and creating jobs where it is needed
- Accelerating the speed and scale of deployment for these solution through digitalization, social and financial innovation
- Providing data when and where it is needed
- Improving local decision structures

5. References

Provide list of references

6. Appendices

6.1. Proposed List of indicators

A proposed **list of concrete indicators to xxxx**. Where relevant, separate indicators should be provided for 2025, 2030 and 2050.

Suggested indicator	Target	Source of the data

6.2. Case studies (some examples are provided in separate file. To the extent possible the case studies **should not exceed 150 words** and should be selected in a way that they clearly presents a problem and the solution. The solution should present evidence xxx, including the means of implementation.

Kindly provide the following:

- Title of The Case Study
- Problem Statement
- Solution
- Lessons Learned
- Link to the Case Study and relevant material

6.3. Suggested reading, core publications