

## CONFIDENTIAL - MEMBERS ONLY

2024-IP02

### 1<sup>st</sup> Meeting of the IEA TCP Coordination Group on Energy System Flexibility, 27 March 2024

#### Background

Operationally, IEAGHG's formal relationship with the IEA is via the Working Party on Fossil Energy (WPFE), previously known as the Working Party on Fossil Fuels (WFFF). The WPFE oversees four other TCPs:

- Gas & Oil Technology Collaboration Programme (GOT CP)
- International Centre for Sustainable Carbon (ICSC) TCP
- Enhanced Oil Recovery (EOR) TCP
- Fluidised Bed Conversion (FBC) TCP

As the IEAGHG's work programme spans several energy sub-sectors, e.g., bioenergy (which reports to the Renewable Energy Working Party) and transport (which reports to the End-Use Working Party), its remit is arguably broader than that of the WPFE. It is therefore welcomed that the IEA's Committee on Energy Research and Technology (CERT) has decided to expand its use of TCP Coordination Groups that, where appropriate, would engage with relevant CEM and MI initiatives. TCP Coordination Groups considered to date by CERT are:

- Carbon Management
- Energy System Flexibility
- Hydrogen
- Critical Minerals
- Heat Pumps
- Cross-cutting topics

In discussion with the IEA, the TCP Coordination Group on Carbon Management (or Carbon Management Coordination Group) would align most closely with the overall technology remit of IEAGHG. It was apparent, however, that parts of the IEAGHG technology remit would also be covered in other Coordination Groups, e.g., the TCP Coordination Group on Energy System Flexibility. The first meeting of the TCP Coordination Group on Energy System Flexibility was held virtually on 27 March 2024.

#### TCP Coordination Group on Energy System Flexibility

This new TCP Coordination Group was approved by CERT on 23 January 2024, with co-leads Michele de Nigris (CERT delegate, Italy) and Andreas Hauer (Chair, Energy Storage TCP). The initial phase of work, aimed at mapping the definitions of flexibility across TCPs representing various parts of the energy system (networks, supply, demand), would comprise two meetings and would report in time for its outcomes to be presented to CERT at its meeting on 11-12 June. Important outputs will be the identification of potential areas of deeper collaboration between TCPs in the context of energy system flexibility.

Along with the co-leads, eleven TCPs plus IEA Desk Officer, Jacques Warichet, engaged in the first meeting. The objective was to locate participating TCPs in the general energy system

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scheme, with consideration to the evolution of the system, from the silos approach to the integrated system.

### **Outputs from the 1<sup>st</sup> meeting**

Michele de Nigris welcomed participants. He provided general background information on the Coordination Groups, with the major focus on the Energy System Flexibility Coordination Group. The outcomes of a survey undertaken prior to the meeting were presented. The survey covered definitions of flexibility from interested TCPs, together with their expectations for the Coordination Group. The ten participating TCPs responded with a diversity of (technical and non-technical) flexibility definitions and expectations.

Andreas Hauer presented a first proposal of definition for the energy system and a tentative TCP structure according to the categorisation “supply – transformation – demand”, which provided the basis for discussion

The need to identify criteria to draft a possible definition of energy system flexibility emerged. There was broad agreement for a definition that was technology-agnostic and that flexibility should be quantifiable and measurable (whether in real life or from models). Flexibility can be provided by a shift in time, a shift in location, an exchange among energy vectors (electricity – heating/cooling – chemical etc.) and, in some cases, among different sectors (energy, industry, mobility, agriculture, services, etc.). In the latter cases, the exchange is driven by an increase in efficiency and reliability/resilience.

Since a unique (if possible) definition of flexibility may be too broad, the goal of the corresponding measures could be mentioned to make it more specific. For example: “Energy system flexibility is the ability of the integrated energy system to adjust supply and demand to achieve energy balance across all timescales in order to integrate higher shares of renewables”. In the context of energy systems decarbonisation, flexibility measures and corresponding KPIs can be characterised by:

- How much energy can be shifted? (capacity)
- How fast can the energy be shifted? (power)
- For how long can the energy shifted? (duration)
- At what cost can the energy shifted? (cost)
- How much CO<sub>2</sub> can be avoided?

### **Next meeting**

The next meeting is planned to be an in-person meeting, hosted by RSE and will be held in Rome on 16-17 May.

Prior to the next meeting, each TCP has been asked to prepare a 2–3-page document with its definition(s), outstanding ongoing or planned work, flexibility types and solutions considered and their expected performances, identification of flexibility needs and provision in the context of the TCP, metrics and other relevant material/references.

The purpose of the meeting will be to identify ways to measure flexibility or to indicate (or measure) the needs for flexibility in different frameworks/applications and to explore the availability of solutions for the different needs of flexibility.

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10 April 2024