



Regional Meeting on Integrating Variable Renewable Energy Sources into Power Systems with a Focus on Nuclear Power

Hosted by

The Government of Tajikistan

through the

Chemical, Biological and Radiological and Nuclear Safety and Security Agency

Dushanbe, Tajikistan

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Information Sheet

Purpose

The purpose of this event is to discuss challenges and solutions for integrating variable renewable energy sources into power systems, focusing on nuclear power plant operations, system stability, and market dynamics.

Working Language(s)

The working language(s) of the event will be English.

Deadline for Nominations

Nominations received after **15 February 2025** will not be considered.

Project Background

The Paris Agreement sets a target for holding the increase in the global average temperature to well below 2°C above pre-industrial levels, preferably below 1.5°C. To achieve this target, the Paris Agreement calls on all countries to prepare increasingly ambitious Nationally Determined Contributions (NDCs). NDCs outline concrete targets, policies and measures that governments aim to implement as a contribution to global climate action. As the major contributor to greenhouse gas emissions, the energy sector is central to these efforts. Recognising this importance and in line with the NDCs, the EU requires its Member States to develop Integrated National Energy and Climate Plans (NECPs) from 2021 to 2030. Energy Community MSs are also recommended to follow this approach.

The TC project RER2018 “Analyzing Low Carbon Pathways towards an Ambitious Decarbonized Energy Sector by 2050” builds on the previous TC project RER2017. It was designed to support the development of energy strategies for climate change mitigation in line with the Paris Agreement, including country plans for the implementation of Nationally Determined Contributions (NDCs) and – as relevant for EU and Energy Community countries – integrated National Energy and Climate Plans (NECPs). It further aims to support Member States in their preparation for submitting related updates, which are due for NDCs by 2025 and for NECPs by 2023 and 2024, respectively, for the draft and final updates.

The project is a platform to discuss the main features and challenges of such strategies and plans. It supports assessments of energy pathways and associated technology mixes, including nuclear power. Through a series of meetings, trainings and expert assignments, the project contributes to exchanging experience and best practices among Member States and to strengthening capacities for energy and climate strategy development.

The power sector is expected to play a key role in decarbonisation process, with a progressive electrification of the energy, transport and industrial sectors combined with a deep decarbonization of the electricity generation mix. Achieving an (almost) full decarbonization of the power sector requires a complete elimination of unabated fossil fuel use and a large deployment of low-carbon energy sources, variable renewable technologies, such as wind and solar photovoltaic, alongside with dispatchable sources such as hydroelectric power, nuclear and fossil-fuel technologies with carbon capture, utilization and sequestration (CCUS). The development of interconnections, innovative storage technologies, demand side measures as well as the use of energy carriers such hydrogen are also likely to play a major role in the power systems of the future. The power sector is expected to evolve towards a larger, more complex, and more integrated system, with a tighter coupling with the broad energy sector.

However, the presence of a significant share of variable sources into the system, the need for new sources of flexibility and the coupling with the broader energy sector make the analysis of the power system significantly more complex and require the use of advanced modelling tools. Uncertainties can also stem from the technical and economic development of many technologies (e.g. variable renewables, storage, demand response and hydrogen, SMRs, non-electric applications of nuclear) which will play an important role in future decarbonized power systems. Key questions concern the reliability and long-term adequacy of such power systems, their overall economic costs, as well as the impacts of policy options to curb carbon emissions.

Low-carbon dispatchable technologies such as nuclear power and potentially fossil fuels with CCS are likely to still be a pillar of future decarbonized power system. However, their role may evolve, with a potential reduction of achievable load factors and increasing requirements for flexibility and for the provision of other system services.

Expected Outputs

The expected main output of this event is an improved understanding of the assessment of future energy supply options with emphasis on operation and development of power systems with high share of variable renewables and potential impact on large scale generators, including nuclear power, as well as the potential role of nuclear power in such systems. In line with this, the event will build capacities for the analysis of energy/electricity supply options and scenarios. It will be encouraged that these approaches are applied as part of ongoing or future national studies.

This event will contribute to the overall outcome of the TC project RER2018, i.e., strengthened institutional capacities to develop national energy and climate plans and strategies.

Scope and Nature

The event will introduce participants to approaches for assessing energy/electricity supply options and analysis of aspects of power systems with high level of penetration of variable power generation. Participants are expected to share their national case studies, information on policies as well as modelling capabilities in this subject.

Event will comprise of lectures, example work sessions and discussions. The lectures will be given by both invited experts and IAEA staff members. Work sessions will focus on supporting participants in developing understanding of the issue and potential modelling approaches to improve power system models. Participants should come equipped with their laptops.

To facilitate the update and development of national case studies, participants need to be aware of their countries' energy and climate strategies and plans, specifically regarding the potential role of various low carbon power generation options. As a further preparation to this meeting, participants are expected to do some background research on the contribution of various technological options, like solar, wind and energy storages, as well as nuclear power including SMRs. They should further identify potential topics of their national interest – e.g. grid development, power system operation, power market development, potential for variable sources integration, use of storages, demand related changes (e.g. transport electrification, distributed generation...). Where available, participants should bring along studies on national energy supply options/scenarios, generation and grid development options and related policies, in place or planned.

Participants will be encouraged to reach out to relevant national institutions to share the findings of this event and apply the discussed approaches as part of currently ongoing or upcoming studies.

Participation

The regional training course is open to participants from the participating Member States of the regional project RER2018 'Analyzing Low Carbon Pathways towards an Ambitious Decarbonized Energy Sector by 2050'.

Participants' Qualifications and Experience

Participants should be specialists in energy & electricity sector planning & environment/climate policy analysis from institutions mandated with the development of national energy and climate plans & strategies. Ideally, they are involved in the development of supply and demand-side strategies for climate change mitigation. They can be engineers, economists or environmental specialists, transmission system operators and related experts.

It is encouraged to nominate up to two participants per Member State from different institutions supporting analysis and development of power generation and transmission system (e.g., representative of national utilities, ministries, research/support organisations, energy planning institutions).

Application Procedure

Candidates wishing to apply for this event should follow the steps below:

1. Access the InTouch+ home page (<https://intouchplus.iaea.org>) using the candidate's existing Nucleus username and password. If the candidate is not a registered Nucleus user, she/he must create a Nucleus account (<https://websso.iaea.org/IM/UserRegistrationPage.aspx>) before proceeding with the event application process below.
2. On the InTouch + platform, the candidate must:
 - a. Finalize or update her/his personal details, provide sufficient information to establish the required qualifications regarding education, language skills and work experience ('Profile' tab) and upload relevant supporting documents;
 - b. Download and complete the [Designation of Beneficiary and Emergency Contact Form](#), and upload to InTouch+ ('Profile' tab under the personal section) specifying the document name. If already provided, kindly discard this step; and
 - c. Search for the relevant technical cooperation event (EVT2406898) under the 'My Eligible Events' tab, answer the mandatory questions and lastly submit the application to the required authority.

NOTE: Completed applications need to be approved by the relevant national authority, i.e. the National Liaison Office, and submitted to the IAEA through the established official channels by the provided designation deadline.

For additional support on how to apply for an event, please refer to the [InTouch+ Help page](#). Any issues or queries related to InTouch+ can be addressed to InTouchPlus.Contact-Point@iaea.org.

Should online application submission not be possible, candidates may download the nomination form for the training course from the [IAEA website](#).

NOTE: A medical certificate signed by a registered medical practitioner dated not more than four months prior to starting date of the event must be submitted by candidates when applying for a) events with a duration exceeding one month, and/or b) all candidates over the age of 65 regardless of the event duration.

Administrative and Financial Arrangements

Nominating authorities will be informed in due course of the names of the candidates who have been selected, and will at that time be informed of the procedure to be followed with regard to administrative and financial matters.

Selected participants will receive an allowance from the IAEA sufficient to cover their costs of lodging, daily subsistence and miscellaneous expenses. They will also receive either a round-trip air ticket based on the most direct and economical route between the airport nearest their residence and the airport nearest the duty station through the IAEA's travel agency AX Travel Management, or a travel allowance, or they will be reimbursed travel by car/bus/train in accordance with IAEA rules for non-staff travel.

Disclaimer of Liability

The organizers of the event do not accept liability for the payment of any cost or compensation that may arise from damage to or loss of personal property, or from illness, injury, disability or death of a participant while he/she is travelling to and from or attending the course, and it is clearly understood that each Government, in approving his/her participation, undertakes responsibility for such coverage. Governments would be well advised to take out insurance against these risks.

Note for female participants

Any woman engaged by the IAEA for work or training should notify the IAEA on becoming aware that she is pregnant.

The Board of Governors of the IAEA approved new International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources. The Standards deal specifically with the occupational exposure conditions of female workers by requiring, inter alia, that a female worker should, on becoming aware that she is pregnant, notify her employer in order that her working conditions may be modified, if necessary. This notification shall not be considered a reason to exclude her from work; however, her working conditions, with respect to occupational exposure shall be adapted with a view to ensuring that her embryo or foetus be afforded the same broad level of protection as required for members of the public.

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