TRAINING WORKSHOP

DEVELOPMENT OF RENEWABLE ENERGY SOURCES IN TURKMENISTAN: FEATURES OF OPERATION AND MAINTENANCE OF SOLAR AND WIND POWER PLANTS IN THE CLIMATIC CONDITIONS OF TURKMENISTAN

03-04 September 2025 (hybrid format)
State Energy Institute of Turkmenistan, Mary

Background

Turkmenistan recently adopted strategic documents (the National Program for Socio-Economic Development of Turkmenistan for 2022-2052, the Program of the President of Turkmenistan for Socio-Economic Development of the Country for 2022-2028), which guide the development of the energy sector based on the principles of sustainable development. To this end, significant steps have been taken to create an appropriate legislative framework. The Law "On Renewable Energy Sources" was developed in 2021; however, it was amended and supplemented in November 2023. According to the Law, the main objectives of the legislation of Turkmenistan on renewable energy sources (RES) are to increase energy productivity through the use of RES, strengthen energy security, develop a competitive energy system, and ensure environmental protection.

On the 17th December 2024, during a meeting between the Ministry of Energy and the SECCA project, the Minister of Energy expressed interest in holding a two-day training seminar for specialists of Turkmenistan's first hybrid solar-wind power plant built near Lake Altyn Asyr in Turkmenistan.

The Training Workshop *Development of Renewable Energy Sources in Turkmenistan: Features of Operation and Maintenance of Solar and Wind Power Plants in the Climatic Conditions of Turkmenistan* will present the experience of Kazakhstan in the development of solar and wind power, as well as its experience in the operation and maintenance of solar and wind power plants.

Programme

Time	Theme	Name and position
03 September – Day 1		
Moderator: Atamuhamet Sariyev, National Coordinator of SECCA in Turkmenistan		
09:00-09:10	**Opening remarks**	**Aganiyaz Jumayev**, Vice-Rector of SEIT **Paata Janelidze**, Team Leader/Key Expert in Energy Engineering, SECCA
09:10-09:30	**Ongoing SECCA activities in Turkmenistan in the field of Renewable Energy**	**Paata Janelidze**, Team Leader/Key Expert in Energy Engineering, SECCA
09:30-10:00	**Development of renewable energy technologies - opportunities within the Horizon Europe programme**	**Ilze Purina,** Key Expert in Energy Sector Governance, SECCA
10:00-10:20	**On the development of Solar and Wind energy in Central Asia**	**Zhaxylyk Tokayev,** Renewable Energy and Climate Change Mitigation Expert, SECCA (online)
10:20-10:40	**Introduction to Solar Power Plant Operation** • How does a solar power plant work? • Main components: panels, inverters, transformers, SCADA	**Farid Uaikanov,** Expert in operation and maintenance of solar power plants, SECCA (online)

10:40-11:00	**Introduction to Wind Power Plant Operation** • How does a solar power plant work? • Main components of a wind farm: wind turbines, generator, nacelle, tower and foundation, control systems	**Dauren Sarmangaliyev,** Expert in operation and maintenance of wind power plants, SECCA (online)
11:00-12:00	**Electrical system and connection to the grid** • How is electricity transmitted to the grid? Solar power plant operating modes: autonomous, hybrid, grid connection • How does the station interact with the control center? *Practical experience: Reading data from inverters and monitoring system*	**Farid Uaikanov,** Expert in operation and maintenance of solar power plants, SECCA (online)
12:00-13:00	**Electrical system and connection to the grid** • How is electricity transmitted from turbines to the grid? • Types of generators: asynchronous and synchronous • Features of power and frequency control • How does the dispatcher manage the wind farm load? *Practical experience: Reading data from monitoring system and SCADA*	**Dauren Sarmangaliyev,** Expert in operation and maintenance of wind power plants, SECCA (online)
13:00-14:00	*Break*	
14:00-15:00	**Monitoring the operation of the station and diagnostics of faults** • How to track the efficiency of solar panels? • Main malfunctions: - Panel failure - Inverter problems - Cable damage • What to do if output decreases? *Practical experience: Analysis of a real case (what to do if the capacity dropped by 20%?)*	**Farid Uaikanov,** Expert in operation and maintenance of solar power plants, SECCA (online)
15:00-16:00	**Turbine operation monitoring and fault diagnostics** • How to monitor key turbine parameters? - Wind speed - Blade pitch - Generator temperature - Vibrations • Typical faults and their symptoms: - Blade breakage - Control system errors - Gearbox problems - Generator overloads • What to do if power drops? *Practical experience: Analysis of a real case (what to do if the turbine suddenly stopped?)*	**Dauren Sarmangaliyev,** Expert in operation and maintenance of wind power plants, SECCA (online)
16:00-16:20	*Break*	
16:20-16:50	**Questions and answers**	

16:50-17:00	**Summarising the results of the first day**	
04 September - Day 2		
Moderator: Atamuhamet Sariyev, National Coordinator of SECCA in Turkmenistan		
09:00-09:20	**On RE development plans in Turkmenistan** (TBC)	**Muhammetaman Sariyev,** Director of the Scientific and Production Centre "Renewable Energy Sources", SEIT
09:20-09:40	**Climate finance opportunities for solar and wind power plants**	**Paata Janelidze,** Expert Team Leader/Key Expert on, SECCA
09:40-10:00	**On the problem of balancing solar and wind power plants in Kazakhstan**	**Zhaxylyk Tokayev,** Renewable Energy and Climate Change Mitigation Expert, SECCA (online)
10:00-11:20	**Equipment maintenance and repair** • Cleaning and checking solar panels • Inverter and transformer maintenance • Timetable of scheduled inspections *Practical experience: Inspection of panels and assessment of contamination*	**Farid Uaikanov,** Expert in operation and maintenance of solar power plants, SECCA (online)
11:20-11:40	*Break*	
11:40-13:00	**Maintenance and repair of turbines** • Scheduled maintenance of wind turbines • Inspection of blades: how to detect damage? • Checking the gearbox and cooling system • Checking connections and electrical circuits *Practical experience: Inspection of the tower, recording the technical condition of the units*	**Dauren Sarmangaliyev,** Expert in operation and maintenance of wind power plants, SECCA (online)
13:00-14:00	*Break*	
14:00-14:45	**Safety and emergency situations** • Electrical safety at SES • What to do if equipment overheats? • How to respond to a short circuit? • Evacuation plan in emergency situations *Practical experience: Analysis of an emergency scenario*	**Farid Uaikanov,** Expert in operation and maintenance of solar power plants, SECCA (online)
14:45-15:30	**Safety and emergency situations** • Electrical safety when working with a wind station • Safety at height (working with winches, insurance) • What to do in case of strong gusts of wind or icing of blades? • How to properly turn off a turbine in an emergency? *Practical experience: Turbine emergency shutdown training*	**Dauren Sarmangaliyev,** Expert in operation and maintenance of wind power plants, SECCA (online)
15:30-16:00	*Break*	
16:00-16:40	**Working with documentation and reporting**	**Farid Uaikanov,** Expert in operation and maintenance of solar power plants, SECCA (online)

	• What logs does the solar station personnel keep? • How to record the station's performance indicators? • How to prepare maintenance reports? • Documentation for accidents and repairs *Practical experience: Filling out a mock-up shift log and recording station performance indicators*	
16:40-17:20	**Working with documentation and reporting** • What logs does the wind station personnel keep? • How to record turbine performance indicators? • How to prepare maintenance reports? • Documentation for accidents and repairs *Practical experience: Filling out a mock-up shift log and recording station performance indicators*	**Dauren Sarmangaliyev,** Expert in operation and maintenance of wind power plants, SECCA (online)
17:20-17:50	**Questions and Answers**	
17:50-18:00	**Summarising the results of the Training Workshop**	