OSCE project: Mitigating Climate Change Threats to Critical Energy Infrastructure

Project Factsheet – No. 1102456

Climate change is increasingly affecting the energy sector: it damages energy assets, overloads power grids, and compromises the reliability of providing energy to people. Over the last years, **power utilities ranked highest** in exposure and vulnerability to long-term risks of climate change.

Extreme weather events and climate variations compromise power plant capacities, while increasing energy demand. **A temperature increase of 3.5°C - 5°C by 2050 could increase the need for electricity by 10-20%**. To strengthen energy security, countries urgently need to integrate these risks into their energy planning and invest in resilient infrastructure for the generation and distribution of electricity.

However, most OSCE participating States have access neither to localized climate projections nor to the know-how to apply them to energy planning. For example, the OSCE Risk and Readiness Assessment revealed that **50% of project countries seldom or never use climate data** for energy planning.

This unique OSCE project equips energy stakeholders with the know-how, capacities, and data to prevent and address climate risks to critical energy infrastructure, prepare for future climate realities, and advance a resilient and long-lasting energy transition.

15 countries
Central Asia, Eastern Europe, South-Eastern Europe, and the Mediterranean region

50 institutions

200 national experts
in energy & climate

2023-2026

Implementing Partner
Argonne National Laboratory

Other Partners
IEA, WMO, IAEA, World Bank

Budget
EUR 2,5 million
Support our project

Webpage

Donors
Austria, Germany, Italy, Poland, United States

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OSCE Organization for Security and Co-operation in Europe

Project Activities

1. Assessment of risks and access to and application of downscaled climate data for energy planning

- Mapping climate risks, and assessing readiness and needs of the energy sector together with **200 national climate and energy experts**
- Running **high-resolution (12 kilometer),** climate models with the help of **supercomputers,** processing them, and making them readily available for energy planning
- Developing and launching an **OSCE Energy Security and Climate Risks GIS Portal** and providing access to it in the four regions for early warning and planning

2. Building national capacities for using scientific tools to improve long-term energy planning and resilience

- Translating the downscaled **climate models to energy** applications and integrating them with energy system models
- Training countries in a series of regional workshops to use **climate and energy simulations** to identify energy security risks, and guide policies and investments in renewable energy for a resilient energy transition

3. Promoting regional and international co-operation for resilient, green, and secure energy transition

- Establishing an **OSCE-wide network** of energy and climate practitioners and policymakers to exchange best practices, know-how, and technology
- Advancing **multilateral and transboundary co-operation** to integrate climate resilience in energy security and transition

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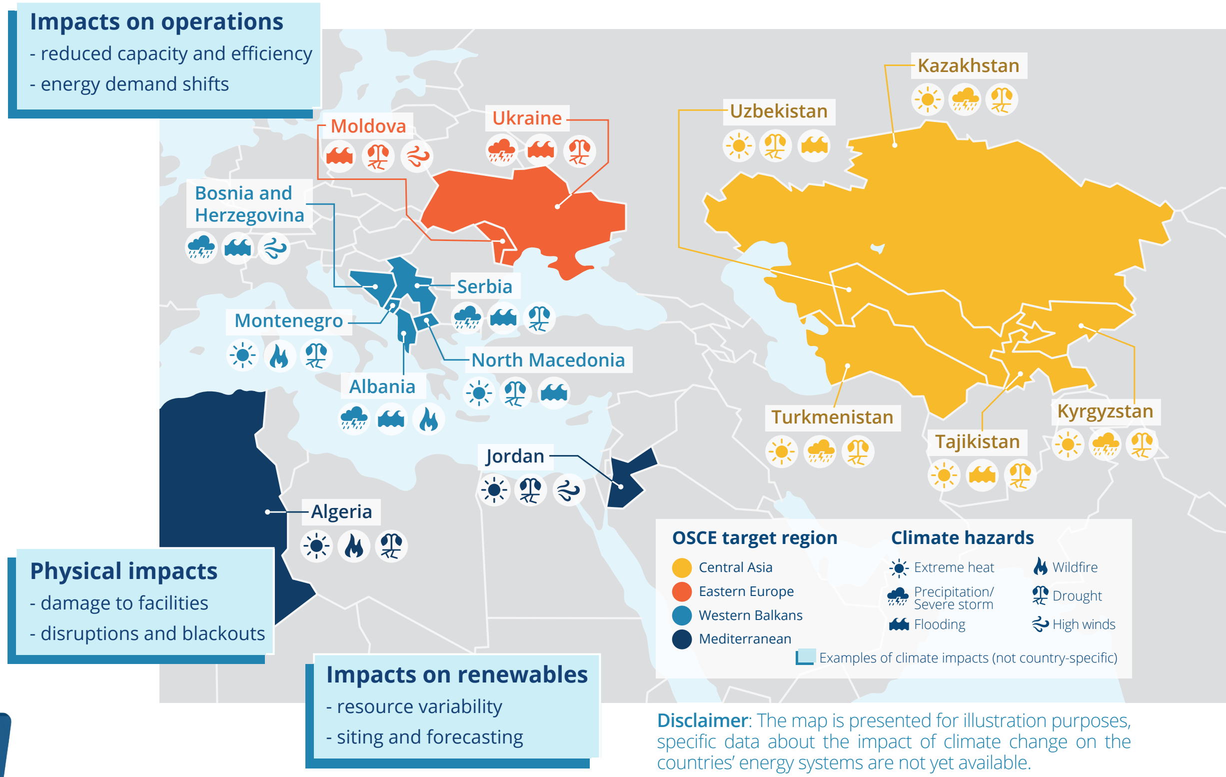
Projected climate change hazards and impacts on the energy sector in the OSCE project countries



Disclaimer: The map is presented for illustration purposes, specific data about the impact of climate change on the countries' energy systems are not yet available.

Explaining the approach

To better protect critical infrastructure and inform policy, business and investment decisions, energy stakeholders need to anticipate and prepare for the possible impacts of extreme weather events and climate variations. To help the energy sector in such decision-making, the OSCE project data will include **55 climate indices** for historical and mid-century periods, which are translated for specific energy applications. For example, power utilities can use granular and localized projections for cooling and heating degree days to estimate future energy demand – and plan accordingly. A renewable energy developer can use the data on future solar energy potential to see where and when solar power can be most efficiently harnessed, and decide on the investment.

Most global models project climate patterns at relatively coarse spatial resolutions, using grid cells of about **50-100 kilometers**. In order to more accurately represent smaller-scale phenomena, such as local weather patterns, global climate models need to be downscaled to the **4-12 kilometer resolution**. Such models are so computationally intense, that running the calculations on a standard laptop for a region the size of the US could take up to **3,000 years**. With the **supercomputers** of the project partner, Argonne, it is only a matter of weeks. The OSCE is making possible the use of such models by energy planners and decision-makers in the project beneficiary countries.