

Background document
Break-out group discussions - part 2 (7 June):
Climate change adaptation in the energy system

Recent policy developments

In 2016, the Commission proposed a Regulation on the [Governance of the Energy Union](#), which is currently under consultation with the Council and the Parliament. The Energy Union comprises five policy areas, which address the three main pillars of energy policies: security of supply, competitiveness and environment. The underlying [Impact Assessment](#) stresses that “*the likelihood of larger-scale incidents affecting the European electricity system might well be on the rise due to extreme weather conditions, climate change (giving rise to extreme and unpredictable weather conditions, which already today constitute a major challenge to electricity systems)*” (Section 2.3). It stresses the large socio-economic damages caused by black-outs, which often have a cross-border nature. The goal of adaptation is to ensure that the transition to a low-carbon, increasingly interconnected and increasingly electrified energy system is resilient to past and projected changes in mean climate and in climate extremes, in order to ensure security and affordability of supply.

[The EU Strategy on Adaptation to climate change](#) (adopted in 2013, currently under review) focuses on three objectives and eight actions. Action 7, *Ensuring more resilient infrastructure*, is particularly relevant for the energy system, which is characterized by long-lived infrastructure. Various related Commission documents are relevant for making the energy system climate-resilient, such as the staff working document on [Adapting infrastructure to climate change](#) and the non-paper [Guidelines for Project Managers: Making vulnerable investments climate resilient](#).

[CEN-CENELEC are taking up an EU mandate](#) to review existing standards relevant for infrastructure and to examine which should be prioritised to include adaptation standards. Energy infrastructure is one of the three priority areas for revised standards. In 2016, CEN/CENELEC held a workshop [Adapting energy infrastructure to climate change: the role of standardization](#), in order to identify priority standards and work programme lists. The revised standards would be relevant for both national infrastructure and the [Trans-European Networks for Energy \(TEN-E\)](#), which focus on linking the energy infrastructure of EU countries.

Recent developments in the knowledge base

A [modelling study for DG Energy](#) from 2011 has assessed the investment needs for adapting the electricity supply in Europe for one scenario, but this study is somewhat outdated by now. The JRC PESETA II project (concluded in 2013) has provided a first economic assessment of [The Impact of Climate Change on the European Energy System](#). More detailed information is expected in the coming months from the recently concluded PESETA III project. Many other scientific institutions, EU-funded and national research projects are also providing relevant information on this topic.

JRC has created a [Unit Knowledge for the Energy Union](#), which provides model-based analysis for the Energy Union Package. Adaptation-relevant activities include the [WATERFLEX project](#), which assesses the water-energy nexus. On this topic, JRC is collaborating closely with the U.S Department of Energy, with which they jointly organized a [large workshop](#) in 2016. Furthermore, the project [Heat Roadmap Europe](#) supports the development of a low-carbon heating and cooling strategy for Europe.

The development of adaptation solutions is further supported by the ongoing development of the [Copernicus Climate Change Service \(C3S\)](#). Its [Sectoral Information System](#) includes two recently concluded demonstrator projects of climate services for the energy sector: [ECEM](#) (European Climate Energy Mixes) and [CLIM4ENERGY](#) (a service providing climate change indicators tailored for the energy sector). The [Joint Programming Initiative Connecting Climate Knowledge for Europe \(JPI](#)

[Climate](#)) is also advancing the development of Climate Services through several [2016 Call Projects](#) financed through the [ERA-NET Cofund for Climate Services \(ERA4CS\)](#). Of particular relevance for the European energy sector are the projects [Clim2Power](#), [CLISWELN](#) and [WINDSURFER](#).

Most EEA member countries have included energy in their national climate change vulnerability assessments (see [EEA Report](#)). Individual countries have also [reporting obligations related to critical infrastructure](#), including energy. Various national governments outside Europe have also developed relevant resources, including [online toolkits \(USA\)](#), [guidance material \(USA\)](#) and [case study collections \(Canada\)](#). Finally, several international organisations (such as the [International Energy Agency](#), the [World Energy Council](#) and the [OECD](#)) have published reports and held workshops aiming at making the energy system resilient to climate variability and change.

EEA and ETC/CCA activities

Last year, the EEA published the report [Climate change, impacts, and vulnerability in Europe 2016](#). This report includes a dedicated section on energy, which comprises an indicator on heating and cooling degree days (developed jointly with the JRC) and further information on the expected impacts of future climate change on energy demand, electricity production and energy infrastructure.

Over the last few months, EEA, supported by an external consultant, developed an internal scoping paper for a potential EEA report on climate change adaptation in the energy system. This scoping paper briefly reviews the available evidence regarding climate change impacts on energy production/conversion, transportation/transmission, storage and demand. It also gives an overview about relevant policies in Europe and presents a selection of early adaptation actions.

EEA intends to use this scoping paper as the background for an EEA report with the working title *Adaptation challenges and opportunities for the European energy system: Facilitating a climate-resilient transition to a low-carbon energy system*. This report would reflect in particular how government policies and other actions by public actors can facilitate the adequate consideration of adaptation needs in the transition to a low-carbon energy system. It would follow on an earlier [EEA report on adaptation of transport in Europe](#).

This EEA report would be prepared jointly with an external consultant and possibly the ETC/CCA. It would be supported by an external Advisory Group comprising of representatives from international organisations, the European Commission, EEA member countries, scientific organisations and industry associations. Eionet consultation is planned for Q4/2018, and publication for Q1/2019.

Questions for the discussion

1. How is the energy system considered in national climate change vulnerability and risk assessments, national adaptation strategies and national action plans in your country?
2. How do environmental administrations, other government authorities and private businesses cooperate on this topic in your country?
3. How useful do you regard an EEA report for developing and implementing adaptation policies in the energy system in your country?
4. Which topics (e.g. national-level policies, national and sub-national vulnerability assessment, collaboration between different actors, etc.) and which energy carriers (e.g. only electricity or also heat and cold, gas and/or oil) would be most important to cover in such an EEA report?
5. How could the EU further support the consideration of adaptation needs in the ongoing transition to a low-carbon energy system?