

ECRAN –TAIEX workshop on risk and vulnerability
assessment and adaptation planning in the energy sector

Tirana, Albania
16 – 17 April 2015

Climate Change and energy planning

Experience from EU Adaptation strategy
development process

Energy sector in EU Adaptation Strategy development

- Study “Climate Proofing” of key EU policies 2011
 - ↳ Energy as one of key policies
 - ↳ Most significant threats
 - ↳ Key technical measures to address the threats
 - ↳ Most appropriate policy actions
- Background research for EU Adaptation Strategy 2012/2013
 - ↳ State of Play in Energy sector
 - ↳ Energy networks and installations as ‘critical infrastructure’
- Background reports for Impact Assessment of EU Adaptation Strategy 2013
 - ↳ Energy as one of key vulnerable sectors
 - ↳ Potential policy actions on EU level

Main messages

All parts of energy systems are potentially vulnerable!

- Fuel **extraction** -> especially off-shore
- Fuel **transport** (pipelines, shipping)
- Energy **production**
 - Renewable resources
 - Thermal power generation
- Energy **transmission** and distribution (grids)
- Energy **demand**



Main messages

Disruptions in energy systems lead to **significant economy-wide losses** and have serious implications on the functioning and life of societies!

Closely interlinked with all other sectors of economy – **high reliance** on continuous and stable energy supply.

Key vulnerable elements

Changes in precipitation, flooding and drought

Temperature changes

Changes in sunlight/cloudiness

Extreme weather events

Glacier and permafrost melt

Sea-level rise

Impacts on Energy Generation

Renewable resources

Impacts on hydropower production

Decreased solar power production due to heat

Impacts on solar power production

Impacts on windpower production

Land movements impacting installations

Impacts on coastal and off-shore installations

Thermal energy generation

Impacts on cooling water supply
Flooding of powerplants

Impacts on cooling

Impacts on coastal installations

Impacts on Energy Transport and Distribution (grids)

Transmission and distribution grids

Potential snow-load or icing

Potential line sagging or icing
Decreased capacity due to heat

Damage to transmission and distribution lines

Damage to transmission and distribution lines

Impacts on coastal installations

Impacts from mudslides and landslides

Pipelines

Damage to pipelines due to land mass movements

Impacts on coastal installations

Impacts on Energy Demand

Increased energy demand for water pumping during droughts

Increased demand for cooling and air conditioning, decreased for heating

- Vulnerability of energy production in other parts of the world can affect energy **supply security** and **energy prices**
- **Increased reliance on electricity** and **renewable energy** may increase the vulnerability of Europe's energy system to climate change
 - ↳ *positive contribution to related climate change mitigation efforts*

BUT

decreases vulnerability to non-climate factors such as **dependence on fuel imports** from unstable regions.

- **Increased integration and interconnected** of EU grids increases management complexity
- **Ageing infrastructure** – urgent need for new investments to cope with intermittency and need for more transmission capacities
- **New prospects** for fuel extraction due to glacier melt worldwide
 - ↳ *potentially negative contribution to related climate change mitigation efforts*

Proposed key technical measures

- **Climate-proofing** electricity **grids**, especially ex-ante proofing of new developments
 - Additional capacities
 - Vulnerability hot-spot detection
 - Installation of underground cables
 - Expanding tree-free aisles in forests
 - Slope stability measure in mountainous areas
 - Relocate flood-prone elements where possible
- Employ **technologies** for renewable energy production that counteract negative climatic impacts
- Install **additional cooling** for thermal power plants
- **Early warning systems** for extreme weather events for power plants
- Install high **energy-efficiency** ventilation for buildings (e.g. 'solar cooling')
- **Smart grids** and smart-metering for demand management
- Increase **energy storage** capacities

Proposed key policy actions

- Demand side
 - Improve energy efficiency in buildings and appliances via **energy performance labelling**
- Supply side
 - Support/fund** introduction of water saving **technologies** for cooling in thermal power production and climate-resilient renewable technologies
- Transmission and distribution
 - Oblige TSOs to ensure **climate risks are taken into account** in the planning, development and management of electricity networks
 - Climate-proof** the trans-European electricity **networks** (TEN-E) already in planning and development stages
- General
 - Mainstream climate change into relevant **industry standards**
 - Enhance **international cooperation** in energy sector

EU 'adaptation package' documents relevant for energy sector

- EU Strategy on adaptation to climate change
<http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52013DC0216>
- Background report to the IA Part I: Problem definition, policy context and assessment of policy options
http://ec.europa.eu/clima/policies/adaptation/what/docs/swd_2013_132_en.pdf
- Staff Working Document *Adapting infrastructure to climate change*
http://ec.europa.eu/clima/policies/adaptation/what/docs/swd_2013_137_en.pdf
- Non-paper Guidelines for Project Managers: Making vulnerable investments climate resilient
http://ec.europa.eu/clima/policies/adaptation/what/docs/non_paper_guidelines_project_managers_en.pdf
- Technical guidance on integrating climate change adaptation in programmes and investments of Cohesion Policy
http://ec.europa.eu/clima/policies/adaptation/what/docs/swd_2013_135_en.pdf
- Related studies: http://ec.europa.eu/clima/policies/adaptation/what/studies_en.htm

Questions?



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