ADAPT ELECTRICITY TRANSMISSION AND DISTRIBUTION NETWORKS AND INFRASTRUCTURE

OBJECTIVE

Limit the effects of climate change on electric power infrastructure.

DESCRIPTION

Adaptation options to tackle the potential impacts of climate change on electric power infrastructure include:

- installing higher power lines poles;
- installing conductors with hotter operating limits or implementing the use of 'low-sag' conductors;
- increasing the minimum design temperature of new overhead line routes. This is a particular cost-effective option, the achievement of which would typically increase the design height of wood poles by 0.5 metres;
- developing a software tool to optimise overhead line ratings.

EXPECTED RESULTS

Adapting electricity transmission and distribution systems to climate change since it protects a key portion of the infrastructure from the aforementioned climate change impacts. Enhanced climate resilience of electric power infrastructure.

RESULT INDICATORS

Reactive power measured in Volt-Amperes Reactive [VAR]
System demand measured in megawatts [MW]

INVOLVED ACTORS

Landowners, local authorities, power industry actors and the general public.

EXPECTED TIMELINE FOR ACTION

- Long term (> 10 years)

BEST PRACTICES

- UK
- Finland
- Italy
- Autonomous Province of Trento – Italy
- Friuli Venezia Giulia Autonomous Region – Italy
- Marche Region – Italy
- Apulia Region – Italy

CRITICALITIES

Underground cabling could be exposed to new climate hazards, in particular from flooding and soil movements related to landslides, so far these risks remain hypothetical.
There are technical limitations to land use in the vicinity of cables specific to underground lines. Beside the need to reserve some land to secure access to the lines for maintenance purposes, there are also restrictions on the planting of trees and hedges over the cables or within 3 m of the cable trench to prevent encroachment by vegetation. Tree roots may penetrate the cable backfill surround which in turn may affect the cable rating or even result in physical damage to the cable. Similarly, for overhead lines, tree growth is discouraged and controlled beneath the overhead line conductors or within distances where trees could fall onto the lines. There will also be height restrictions for machinery or especially high vehicles, such as agricultural equipment, near overhead lines for safety reasons. In urban areas, the land surface used for buried cables far exceeds the one required for an equivalent share of overhead line.

SCOPE OF THE ACTION

- Adaptation

TYPE OF PROPOSED ACTIONS

- Grey

SECTOR OF ACTION

- Energy

CLIMATE IMPACTS

- Extreme temperatures
- Floods
- Strong winds

IMPLEMENTATION SCALE

- Municipality

SOURCE

https://climate-adapt.eea.europa.eu/help/share-your-info/general/adaptation-options-for-electricity-transmission-and-distribution-networks-and-infrastructure
https://www.energy.gov/sites/prod/files/oeprod/DocumentsandMedia/primer.pdf