Crisp, distributed intelligence in critical infrastructure for sustainable power (CRISP)

Results in Brief

Distributed intelligence

The electricity system inherited from the 20th century has been reliable, but centrally coordinated. Advanced information and communication technologies can effectively introduce intelligence into the electric power network.

CLIMATE CHANGE
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Information and communication technologies (ICTs) will be indispensable in managing the electric power networks of the future, in which distributed energy resources (DERs) will play a central role. ICTs already offer the advanced capabilities required for monitoring today's complex networks at an affordable cost.

The ultimate aim of the CRISP project was to derive all the benefits from available ICT opportunities for promoting the sustainable development and growth of electric power grids. To integrate DERs as well as renewable energy resources (RERs) efficiently, new grid architectures will be required. To this end, intelligent control over network operations will need to be extended to the distribution level and beyond.

Project partner IDEA G.I.E. in France proposed a grid architecture oriented towards more flexible and importantly, distributed network operations. Sub-networks could be

managed by a software agent, the 'Smart grid automation device' (SGAD) that enables decentralised real-time control of the electric power network.

The SGAD can download from the regional control room part of the network's electrical map that corresponds to the so-called local 'grid cell' and update it when changes to its configuration are required. Local information, for example about the future electric power production and consumption could also be sent by the SGAD upwards to a higher level control centre.

There, all this information could be progressively aggregated and processed, whereby the production and consumption balance of the electric power network as a whole is checked and rational decisions are taken. If electric power reserves are be able to respond in real time, the stability and robustness of electric power networks could be strongly reinforced by the contribution of DERs and RERs.

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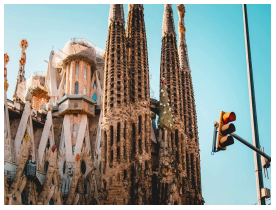

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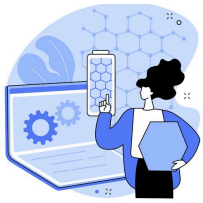

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CRISP

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