IAQ QUALITY SUSTAINABILITY AWARD 2022 - ONE-PAGE SUMMARY

The One-Page Summary should be filled in and submitted as Appendix 1 to your Application. It will also be published on the IAQ Quality Sustainability Award Homepage; http://iaqaward.com. The length of this document must not exceed 1 page.

Project and contact details

The name of the quality sustainability project (max. 100 characters)

Lightning sensing and dynamic protection technology for distribution network based on artificial intelligence prediction

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Organisation(s), country, where the project-members are working, including Web-page links

State Grid JiangSu Electric Power Co. Ltd Suzhou Branch, State Grid Corporation of China (SGCC), Suzhou, China
http://www.js.sgcc.com.cn/html/szgdgs/col780/column_780_1.html

Project description

Through intelligent lightning sensing and trajectory prediction, this project adjusts the operation mode of the power grid in the thunderstorm risk area in advance, and minimizes the hazard of lightning accidents in the power grid.

The project focuses on intensive infrastructure construction and intelligent information system management and control. Only one sensor and one system are needed to realize lightning monitoring of 10,000 square kilometers and lightning protection of more than 1,000 square kilometers. Based on the whole industry, promote the application of universal technology, which can be extended to weather forecasting, transportation, scenic tourism, maritime resources exploitation and even defense and military industries and other fields. The regulation of renewable energy such as wind power and photovoltaic will be introduced into the dynamic lightning protection system to facilitate clean consumption of renewable energy.

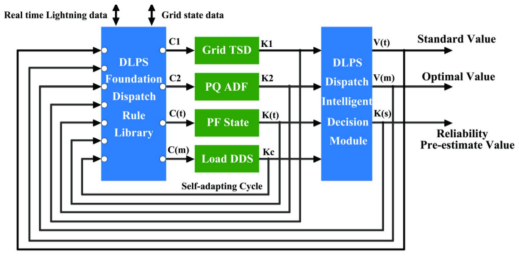
Specifically, the project proposes the broad spectrum sensing and frequency division detection technology to achieve real-time lightning tracking of 10,000 square kilometers at a single point. Multi-vector opto-magnetic complex mode sensing technology is proposed to realize omnidirectional visual early warning of intelligent distribution network. The coordinated control technology of distributed power supply and dynamic lightning protection of distribution network based on real-time lightning tracking is proposed to realize nonlinear dynamic lightning protection control of intelligent distribution network and significantly improve the overall lightning protection performance of power network.

In particular, the project supports the United Nations Sustainable Development Goals 7, Goals 9 and Goals 13.

Project leverage potential

The potential customers and related parties of this project include: power grid companies, power users, distributed energy party, Suzhou Government, etc. From the point of view of the power grid company, the focus of lightning protection is to maintain the overall stability of the power grid in the thunderstorm weather, to avoid the loss of important power supply caused by lightning tripping grid voltage, frequency fluctuation, instability, and eventually lead to large-scale power failure. From the point of view of electricity customers, the key is how to ensure the reliable power supply of load and the safety of their own equipment and data under bad weather conditions. The project results are adapted to the future climate change, which can comprehensively improve the security and stability of the power grid, significantly increase the power supply reliability rate, and improve the safe and stable operation level of the entire power grid. It has huge social and economic benefits. The lightning detection and early warning technology used in the project can also be applied to weather forecast, transportation, scenic tourism, maritime resources exploitation and even national defense and military industry and other fields, with high promotion value.

Picture/Image describing the project



Note. More information about the award and how to apply can be found on the IAQ Quality Award homepage