Università di Bologna

AVVISO DI SEMINARIO

"RESILIENT AND EXPANDABLE DISTRIBUTION NETWORKS FOR SMARTER GRIDS"

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Nuclear and thermal power generation facilities were easily damaged by the 2011 off the Pacific coast of Tohoku Earthquake, and the capacity to supply energy in areas serviced by TEPCO decreased by about ten million KW. The widespread shortage of electricity has made us keenly aware of the need for households, offices, factories, and local governments to maintain their own power sources that are not completely dependent on electric power companies. It would be suitable to create power supply networks (known as clusters) that are of appropriate scale for their respective regions and towns instead of large-scaled and costly networks all at once, to add new clusters when needed, and to have them collaborate with each other when developing power supply systems where regional governments are the main entities. If such power networks that can work to serve one another were to be built, power supplies to various regions from power sources with renewable energy at relatively low costs, electric power interchanges between clusters through collaboration, the effective utilization of power shortage systems, and the rapid charging of electric vehicles could be made possible. Vital lifelines (electricity, water, and communication) could be secured even during large-scale natural disasters if such administrative agencies, hospitals, police stations, schools, evacuation centers, communication bases, and elderly housing facilities were completed centering on "Our village Power Plants" operated by regional governments. This capability is known as "resiliency," and it will one day be the guideline for building the social infrastructure. I believe that these ideas must be utilized for the restoration of the afflicted areas in the Tohoku area, which is now underway.

Ryuichi Yokoyama received the degrees of B.S., M.S., and Ph.D. in electrical engineering from Waseda University, Tokyo, Japan, in 1968, 1970, and 1974 respectively. After working in Mitsubishi Research Institute, from 1978 through 2007, he was a professor in the Faculty of Technology of Tokyo Metropolitan University. Since 2007, he has been a professor of the Graduate School of Environment and Energy Engineering in Waseda University. His fields of interests include planning, operation, control and optimization of large-scale environment and energy systems, and economic analysis and risk management of deregulated power markets. He is a fellow of IEEE and a senior member of IEE of Japan, and a member of CIGRE.