

«Question»

Even with the adoption of 5G, it is expected that utilities will continue to adopt a mix of radio technologies for different purposes. Describe the differences, advantages, disadvantages between 5G and other wireless radio technologies in the context of power utility use cases.

«Answer»

When electric power utilities construct a new wireless communication system, the communication requirements, including the coverage, transmission data size, latency, network security, etc. should be clarified.

The optimal approach here is finding the right radio technology for each place and application. This means the transmission characteristics, radio licensing condition, network running costs of these radio technologies, etc. should be considered. Table 1 shows the comparison between 5G and other radio technologies

If no radio technology can be satisfied with the application requirements, several radio technologies combined can be considered to improve the stability. Figure 1 shows an example of combined communications for distribution automation systems.

Table 1 Comparison between 5G and other radio technologies

	5G	LTE	LTE-M	NB-IoT	Wi-Fi	LPWA
Radio licensing	Needed	Needed	Needed	Needed	None	None
Public or Private	Both	Both	Public	Public	Private	Both
Coverage (Usable area)	Up to several km	Up to 15 km	Up to 15 km	Up to 15 km	Up to about 800 m (LoS)	Up to about 20 km (LoS)
Transmission rate	Up to several Gbps	Up to 150 Mbps	Up to 1 Mbps	Up to 63 kbps	Up to 9.6 Gbps	Up to 1 Mbps
Latency	Low	Low	Low	Low	Low	High
Running costs	High	High	High	High	Low	Low
Stability	High	High	High	High	Low	Low
Applicable systems (for example)	Collecting sensor data for electric power facilities, long distance and large data	Collecting sensor data for electric power facilities, long distance and small data	Collecting sensor data for electric power facilities, short distance and large data	Collecting sensor data and controlling for electric power facilities, long distance and small data	Collecting sensor data and controlling for electric power facilities, short distance and large data	Collecting sensor data and controlling for electric power facilities, long distance and small data

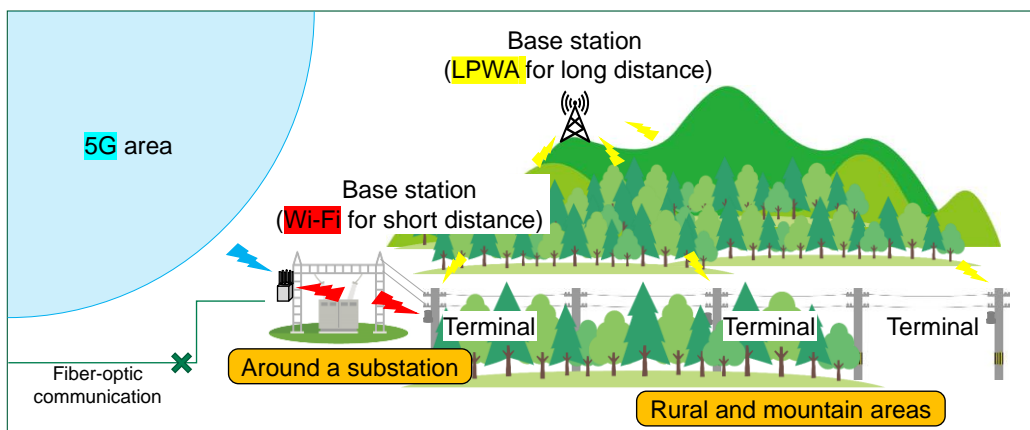


Fig. 1 An example of combined communications for distribution automation systems