Utility Radio Spectrum

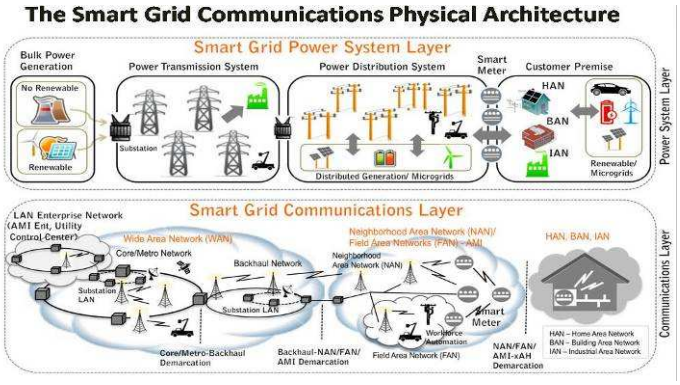
Why utilities need access to radio spectrum

JRC Ltd, London: 31 May 2013

Reliable, secure and sustainable electricity supplies are an essential element of modern western society. Dependable utility services are taken for granted in western society: without them, the economy is damaged and civil disorder rapidly spreads.

The future energy grid is envisaged as an evolution of today's passive one-directional network into a network which manages two way flows of electricity in an active dynamic manner, incorporating large scale embedded generation to deliver secure, affordable and low carbon electricity.

Essentially, this vision will be realised by overlaying the physical electricity grid by an ICT network changing a 'dumb' network into an intelligent one.

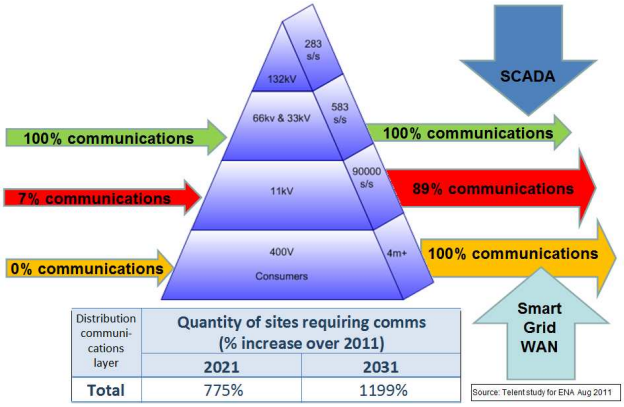


But at the centre of 'ICT' are communications, and although fixed telecommunications networks based on copper and fibre will form a strategic backbone, radiocommunications will be an essential element. This is because many applications cannot be delivered on an appropriate timescale and cost without access to radio technologies.

Radio is inherently more flexible than fixed networks, and in many applications is more cost effective. Radio can be made resilient more easily and redundancy tested.

Commercial radio networks – essentially the mobile phone networks – will have a major part to play in this communications revolution, but private radio networks will also have a place where enhanced resilience, security and geographic reach are required. The key metric here is 'control', in that in a private network – whether self-provided or a commercial provider – the utility can specify the required access priorities, security level, geographic coverage, redundancy and power resilience - most importantly the period for which the network must remain operational in the absence of a wide-area power supply interruption.

To operate a private radio network, an essential ingredient is radio spectrum. Around the world, mobile operators are scurrying to acquire radio spectrum as future communications become more dependent on radio – and it is the archetypal scare resource in that no more can be manufactured or created.



Distribution communi-cations layer	Quantity of sites requiring comms (% increase over 2011)	
	2021	2031
Total	775%	1199%

Distribution pole with manual switch.

Utilities are therefore increasingly focusing on acquiring dedicated spectrum in frequency bands which support the key operational telecoms services the core business requires. The precise number of additional connection points which will require automatic control is not clear yet, but most studies point to at least one hundred fold, and possibly a thousand fold increase in these 'points of presence'.

JRC is voicing this requirement on behalf of its utility members at a time when major telecommunications and IT companies are committing vast resources to acquiring spectrum, and many other users are also lobbying governments for access to spectrum.

Distribution pole with radio-controlled switch.

Utilities already have access to a small amount of spectrum, but unless we promote our case vigorously, we will not gain access to the additional spectrum required for the next generation of smart grid services.