



NETWORKS

JRC Annual Seminar

4th October 2018

Paddy Mulvey, Strategy & Design,

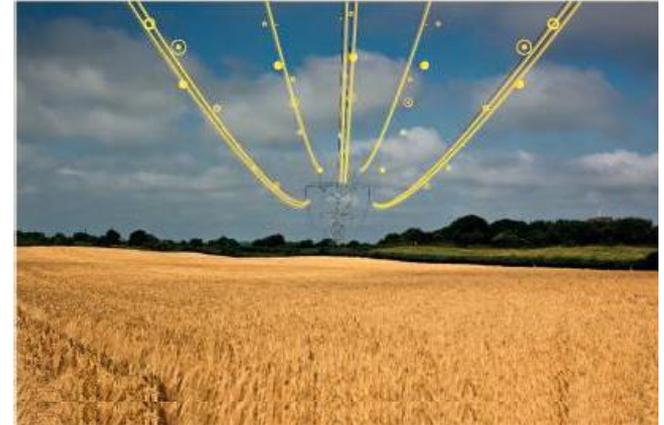
Telecom Services, ESB Networks



To give **you** an understanding of
**Smart Grid developments in
Ireland and the role of enhanced
communications capability**

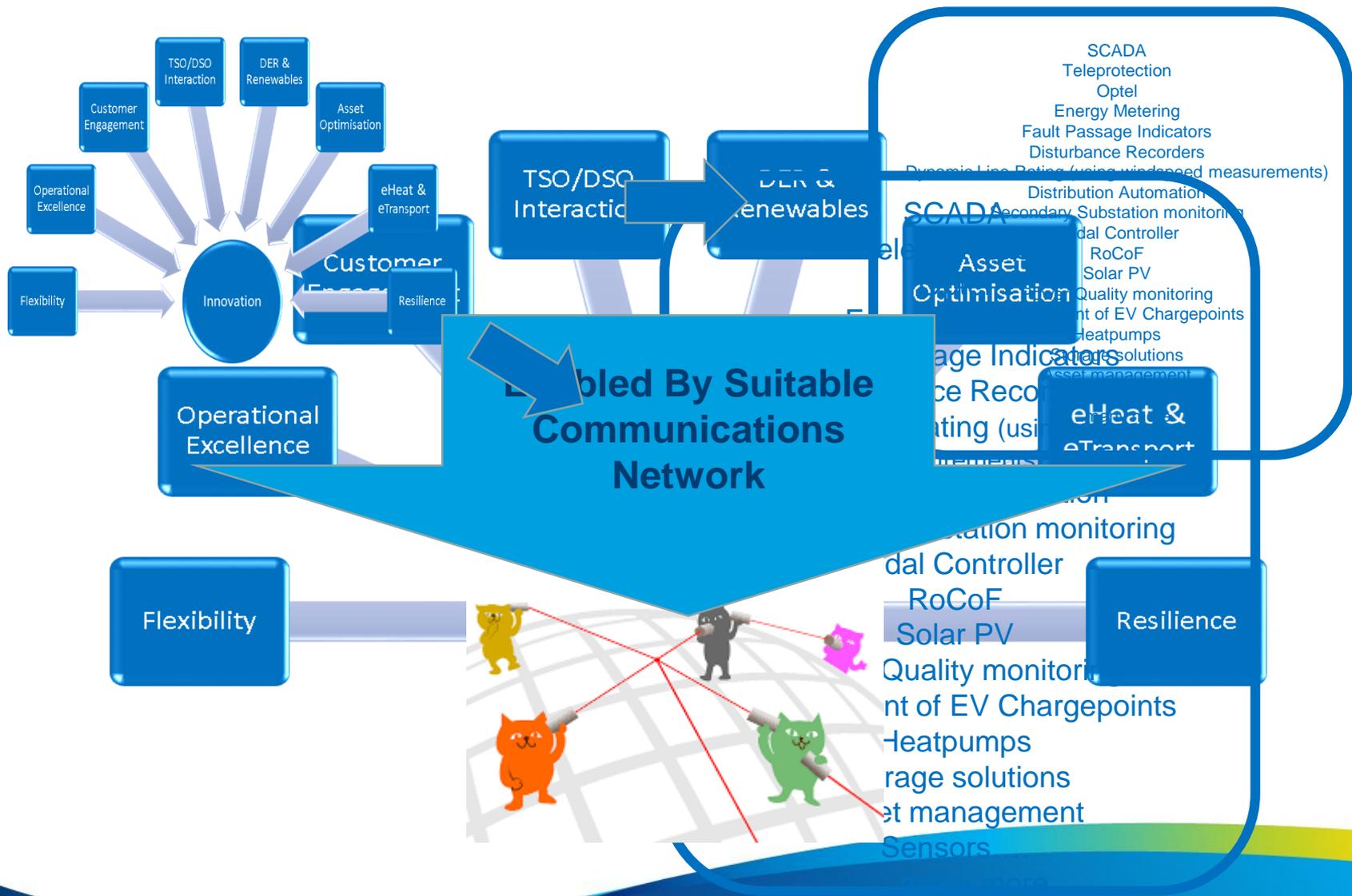


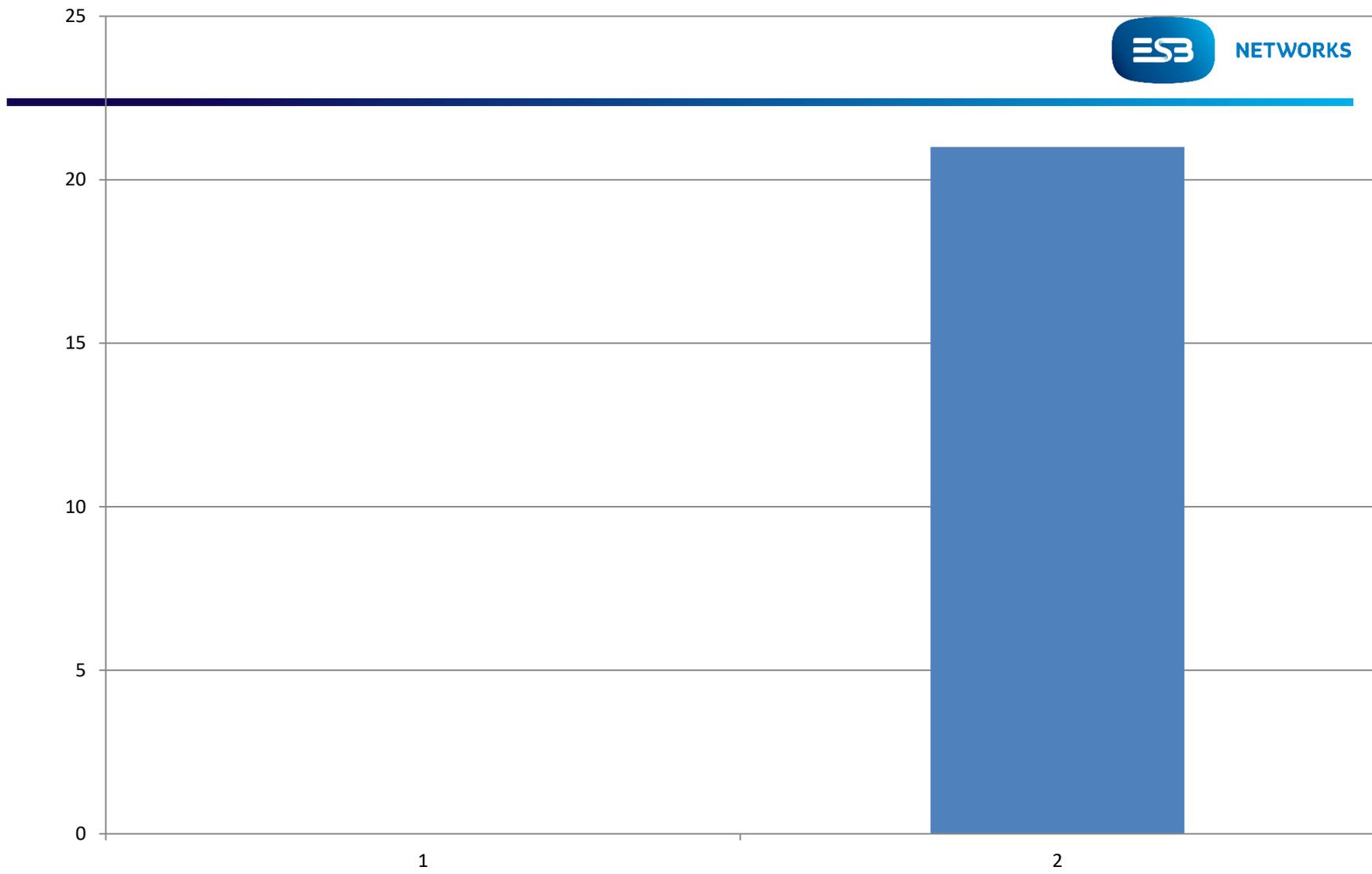
- MV & HV 99% observed
- 760 Substations
- 100,000+km
- 10,000 line sensors



- LV 99% unobserved
- 252,276 Substations
- 92,326km
- 100+ sensors

Innovation Driving Requirement for New Communications Solutions



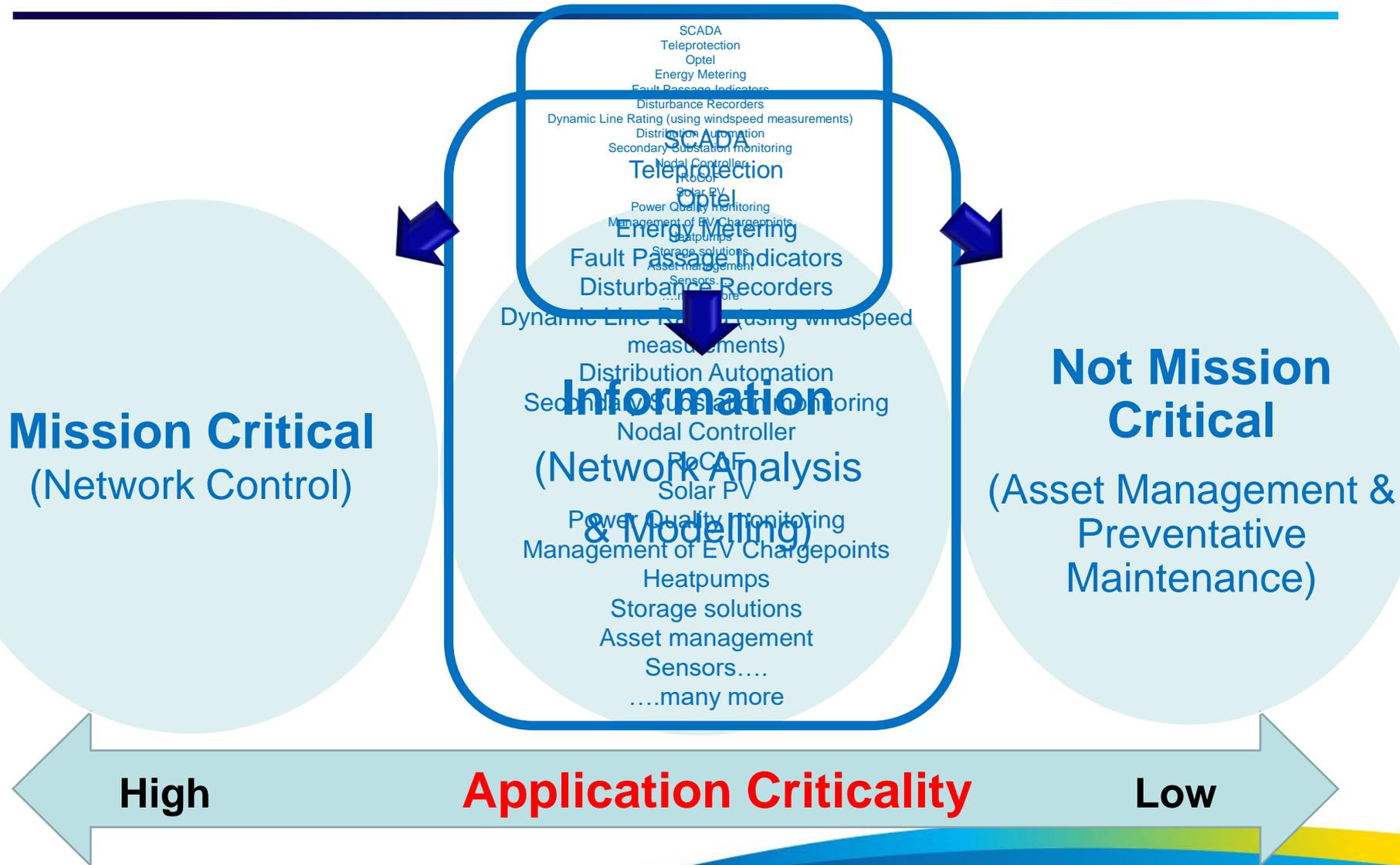


99.999%



10%

How Critical are these Applications??



Licensed Private Network

UHF/VHF technologies
Microwave radio
Narrowband Satellite
CDMA
Proprietary radio solutions

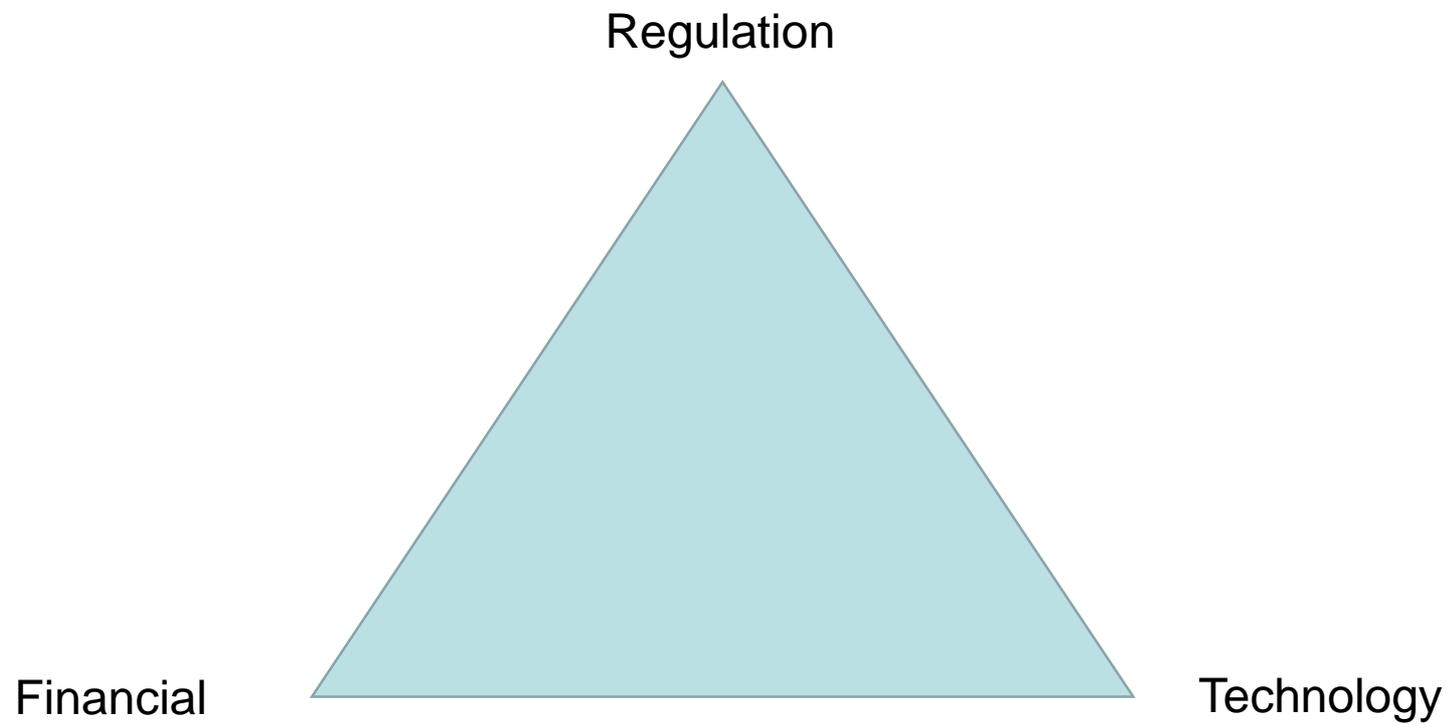
Licensed Public Network

GPRS/2G
3G/4G(LTE)/5G
Satellite broadband
NB-IoT
LoRa

Licence Exempt Solution

Narrow Band Technologies...
SigFox
SilverSpring
LoRa





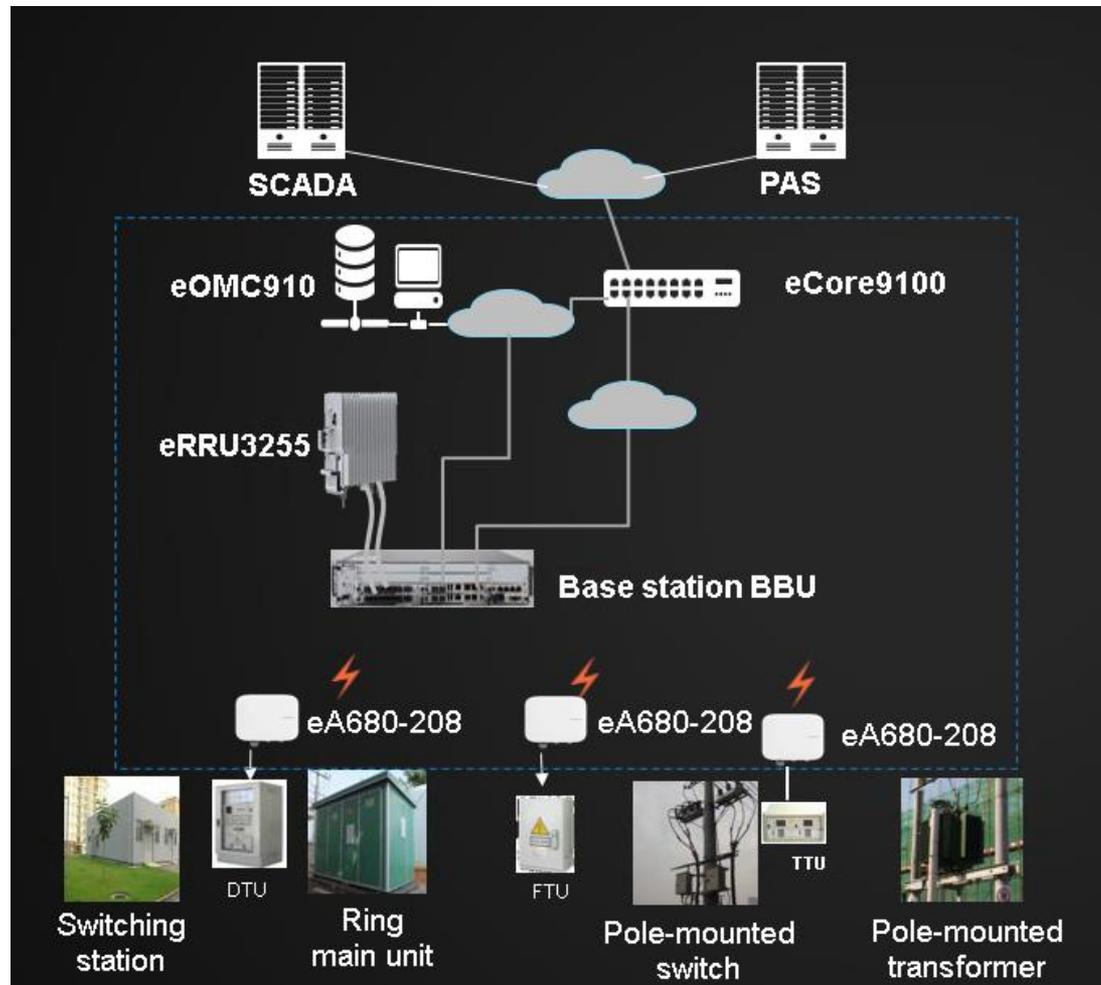
Frequency Band (MHz)	ITU Allocation and Footnotes applicable to Ireland	European Common Allocation	National Usage	National and European Legislation	Relevant CEPT Decisions and Recommendations	Notes
				(Business Radio Licence) Regulations 1949 as amended		02/02R and 08/08R (as revised)
			Land mobile: PMR 446 (446-446.1 MHz)	National Legislation: S.I. 93 of 1998	ECC/DEC/(15)05	
			Digital PMR446 (446.1-446.2 MHz)	National Legislation: S.I. 160 of 2006	ECC/DEC/(15)05	
	Radiolocation	Radiolocation				
			Short Range Devices	National Legislation: S.I. 405 of 2002 S.I. 160 of 2006	ERC/REC 70-03	See ComReg document 02/71R (as revised)
	5.286	EU31				
450 - 455	FIXED					
	MOBILE	MOBILE	Land mobile (PMR UHF band) and Community repeaters	National Legislation: Wireless Telegraphy (Business Radio Licence) Regulations 1949 as amended. S.I. 435 of 2002 S.I. 83 of 1988	ECC/DEC/(06)06 ECC/DEC/(04)06 Recommendation T/R 25-08	See documents 00/07aR and 00/07R (as revised) 02/02R and 08/08R (as revised) 02/03R
	5.209 5.286 5.286A	EU31				
455 - 456	FIXED					
	MOBILE	MOBILE	Land mobile: PMR UHF band, digital land mobile civil	National Legislation: Wireless Telegraphy (Business Radio Licence) Regulations 1949 as amended. S.I. 435 of 2002	ECC/DEC/(06)06 ECC/DEC/(04)06 Recommendation T/R 25-08	See documents 00/07aR and 00/07R (as revised) 02/02R and 08/08R (as revised) 02/12R



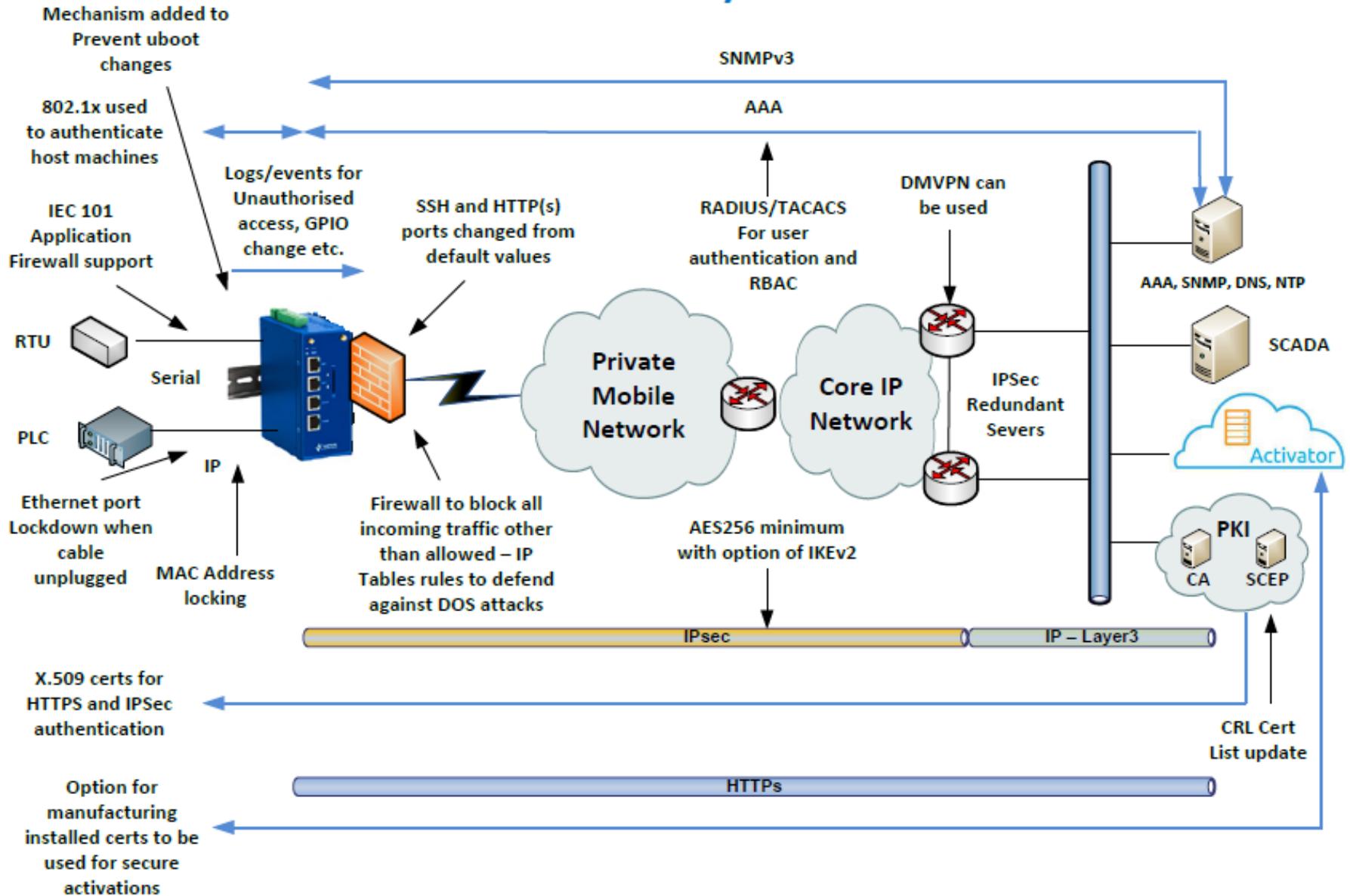
Consultation on Proposed Release of the 410-415.5 / 420-425.5 MHz sub-band

3.114 ComReg has now procured technical services to examine in detail the potential uses of the 400 MHz band and the likely spectrum requirements of same. In addition, independent economic and spectrum award design services have been procured which will inform ComReg's further consultation, currently expected to be published in the latter part of 2018.

- Prove technology for carrying applications such as:
 - RTU (IEC 101 & 104)
 - Distribution Automation
 - Fault Passage Indicators
 - Power Quality Meters
 - MV substation monitoring etc
- Understand the impact of a full network rollout in terms of:
 - Deployment resources (WAN)
 - Support resources (Operations, TOC etc)
 - Technical requirements (Physical, WAN Network / Backhaul, Security etc)
 - Financial (PRx, Contract, etc)



Substation Security Architecture



Total plan for the trial



Phase 0

1. Equipment shipment
2. LLD design

Phase 1

1. Hardware installation
2. Basic train and equipment hardware/software adjusting
3. Interface and IP plan
4. Lab Test
5. Result review and confirmation

Phase 2

1. Filed Test survey
2. Hardware installation for the Filed
3. Filed Test
4. Result review and supplementary test

Phase 3

1. Technical evaluation, approval of business case, acquire spectrum



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