



**ITU Workshop on  
Spectrum Management for  
Internet of Things Deployment  
(Geneva, 22 November 2016)**

**Perspective for  
harmonization of  
frequency bands and  
regulatory environment  
for IoT in RCC countries**

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Group on Spectrum Management

**ITU WORKSHOP ON SPECTRUM  
MANAGEMENT FOR INTERNET  
OF THINGS DEPLOYMENT**

**GENEVA, SWITZERLAND  
22 NOVEMBER 2016**

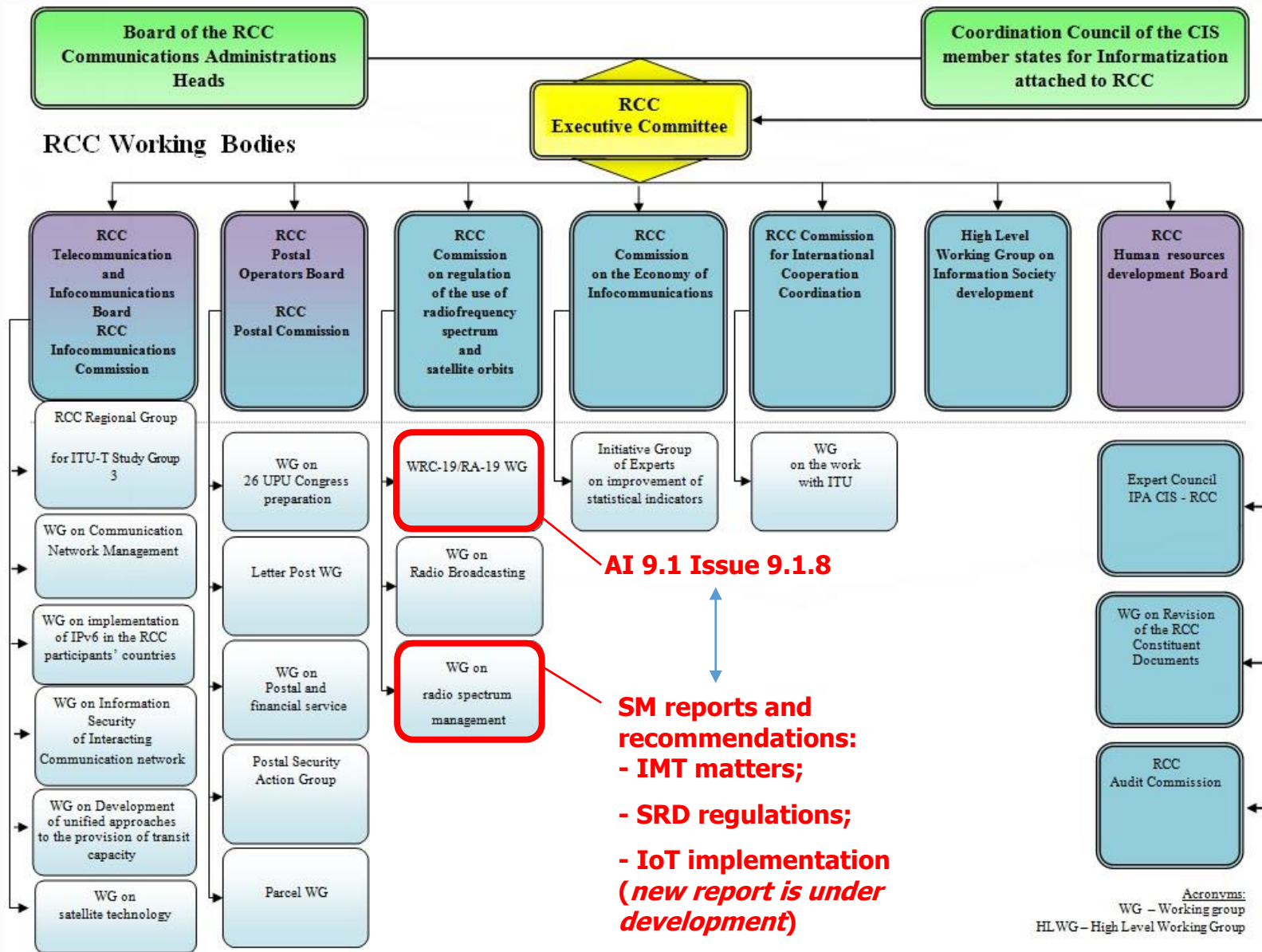
[www.itu.int/go/ITU-R/RSG1SG5-IoT-16](http://www.itu.int/go/ITU-R/RSG1SG5-IoT-16)

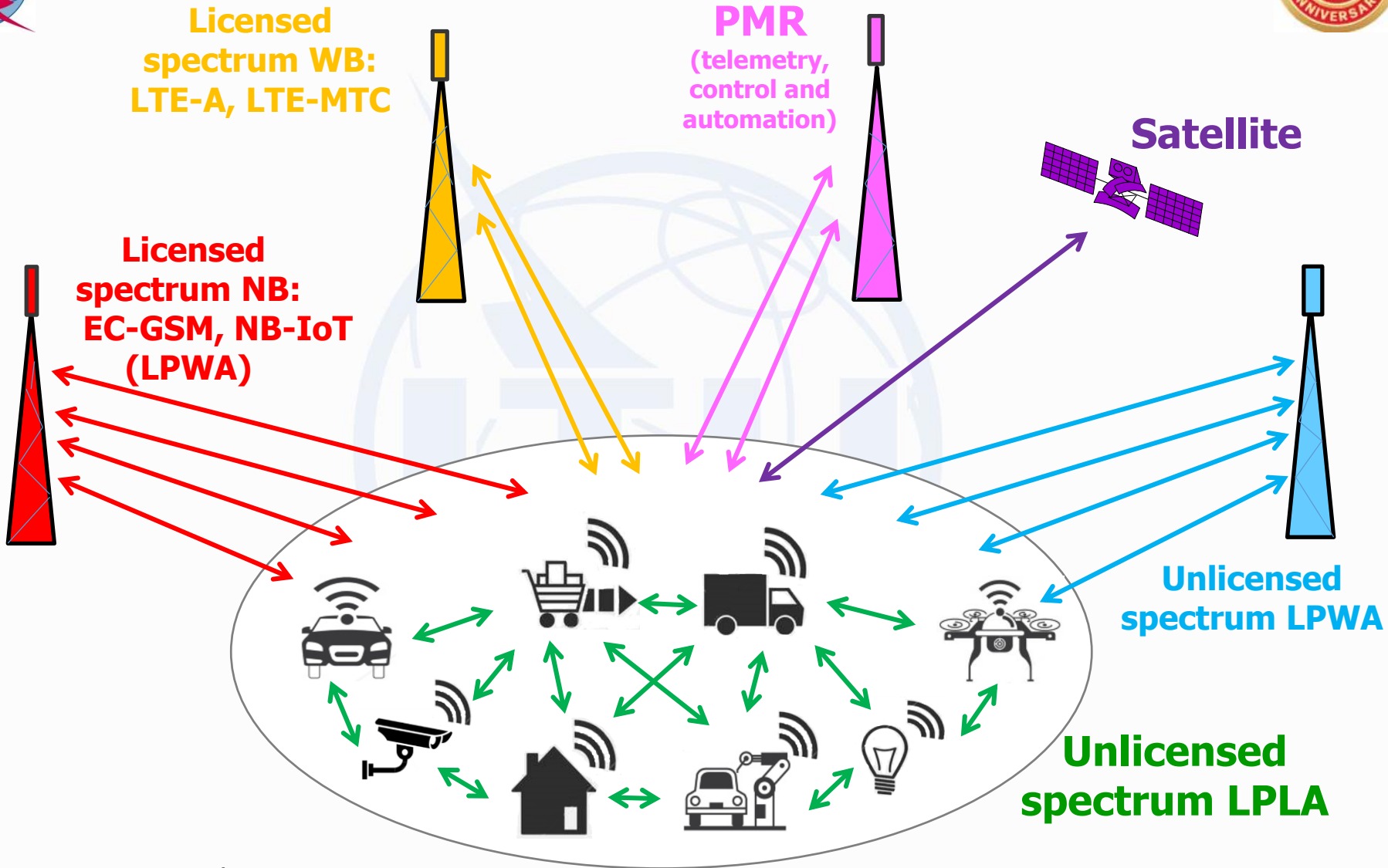
Organised by:





# RCC structure and IoT spectrum related activities





LPLA: Low Power Local Area  
LPWA: Low Power Wide Area

# Unlicensed spectrum usage for IoT - SRD



IEEE 802.11ac

IEEE 802.11ah

ZigBee (IEEE 802.15)

Bluetooth SMART Bluetooth LE (IEEE 802.15)

WiSUN (IEEE 802.15)

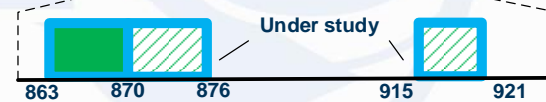
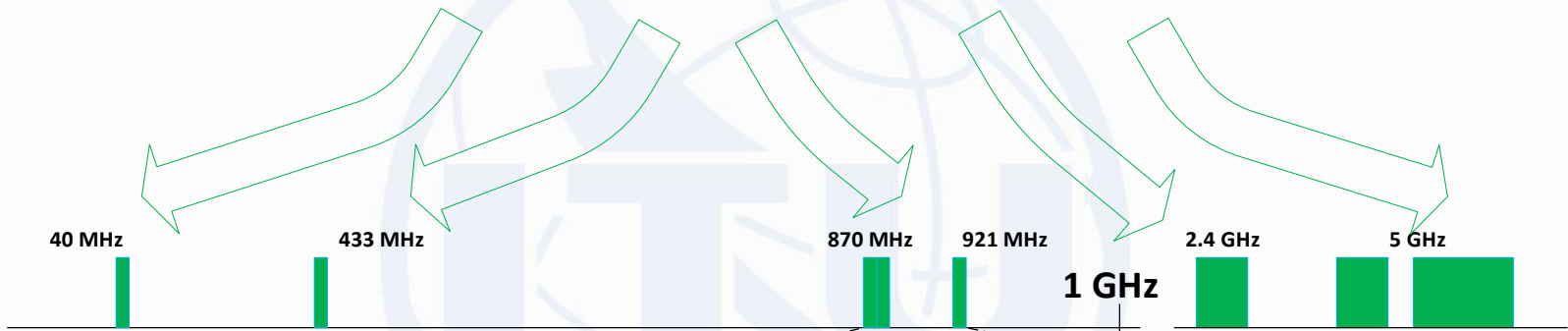


DASH7



6LoWPAN

and many others



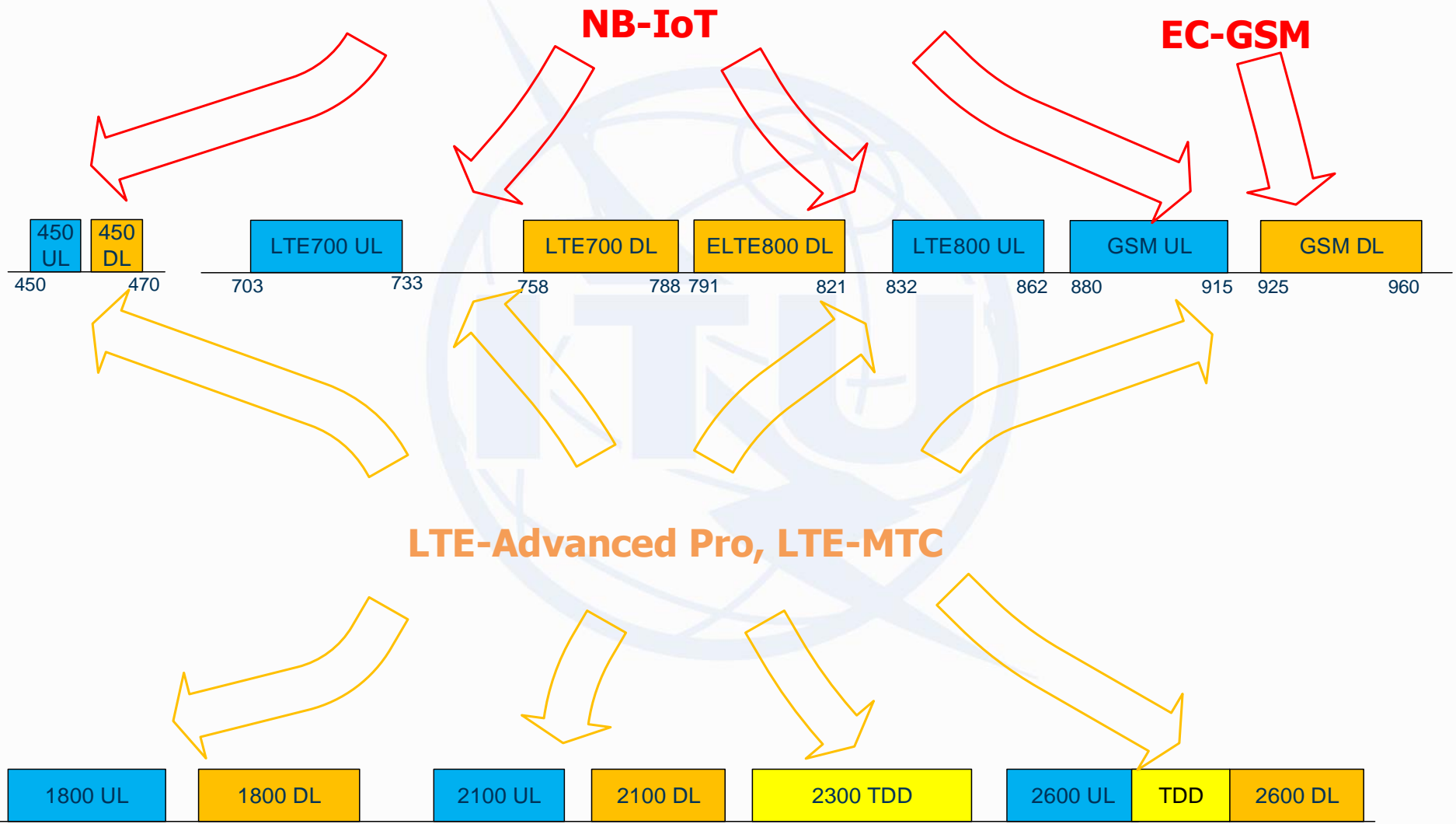
Strij



Sigfox

and others

(RCC based start up with UNB interface: two-way communication and extended coverage)



## Existing PMR usage for M2M



Oil, gas and chemical plants



Factories



Railroad



Utilities

## New challenges and trends



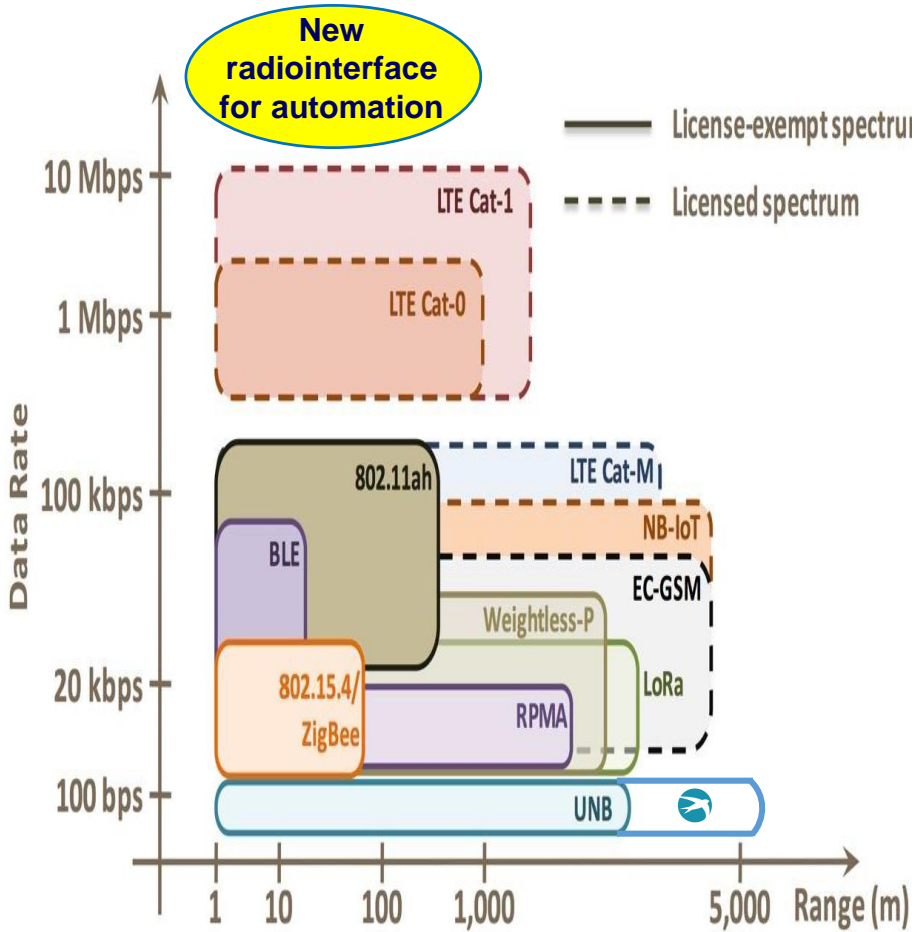
More devices and new applications, including broadband

The need for new radiointerfaces, including broadband

SRD or IMT usage for non-critical applications

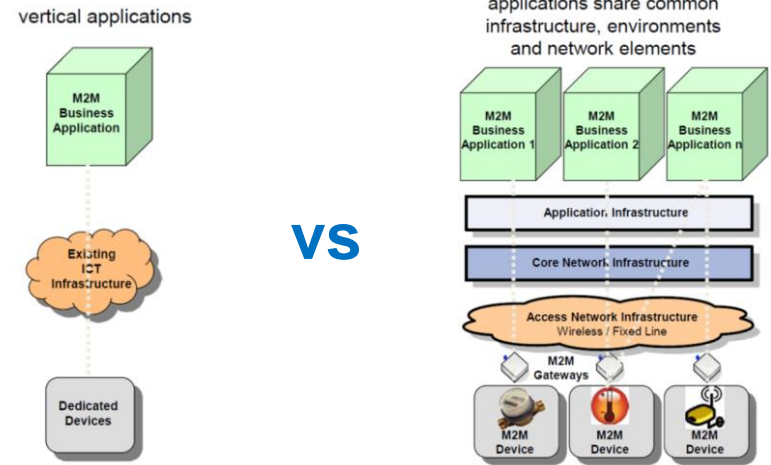
**New dedicated locally licensed spectrum for critical applications**

## Different radiointerfaces

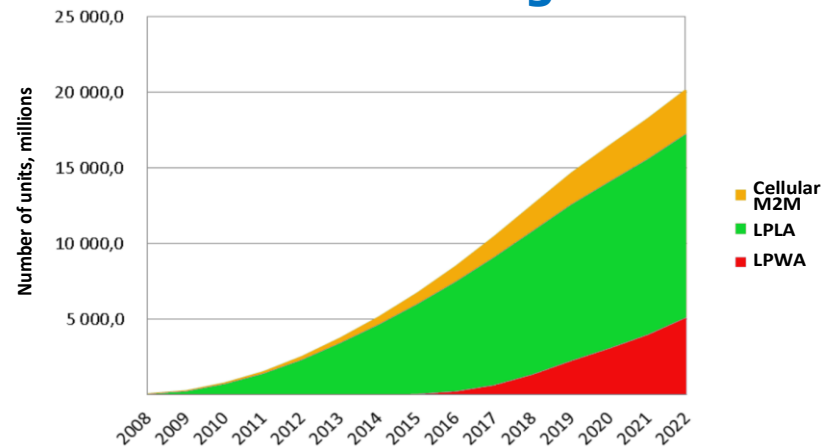


Source: Mobile Experts LLC., 2015

## Different business models



## Vast market to grow on



Source: Strategy analytics, 2014

- **Licensing and spectrum management**
  - ✓ Licensed **vs** Unlicensed spectrum
  - ✓ Dedicated **vs** Shared network
- **Switching and roaming**
  - ✓ SIMs with remotely updatable IMSI
  - ✓ MNC for broader range of services
- **Addressing and numbering**
  - ✓ IPv6
  - ✓ International Mobile Subscriber Identifier
  - ✓ DOA
- **Competition**
  - ✓ Vendors
  - ✓ Network operators
  - ✓ IoT platform providers
- **Security and privacy**

**Spectrum is only one piece of the puzzle, and not the most significant one**

Value split for IoT technology spending, 2015

100% = \$50 billion–140 billion

<b>Integration services</b> 20–40	Physical setup	10–20
	General contracting/project management operations	10–20
<b>Software/app development</b> 20–35	Algorithms	0–5
	Business apps	10–15
	Packaged software	10–15
<b>Software infrastructure</b> 5–20	Device cloud	0–5
	Security	0–5
	Analytics tools	5–10
<b>Connectivity</b> 0–10	Connectivity	0–10
<b>Hardware</b> 20–30	Other hardware costs	15–20
	Sensors	5–10

**Source: McKinsey Global Institute, 2015**





***Thank you  
for your attention***

