

Radio Spectrum and Technical Standards Advisory Committee

SSAC Paper 6/2013 for Discussion: Overview of Spectrum Demand for Smart Meters

Office of the Communications Authority
23 May 2013

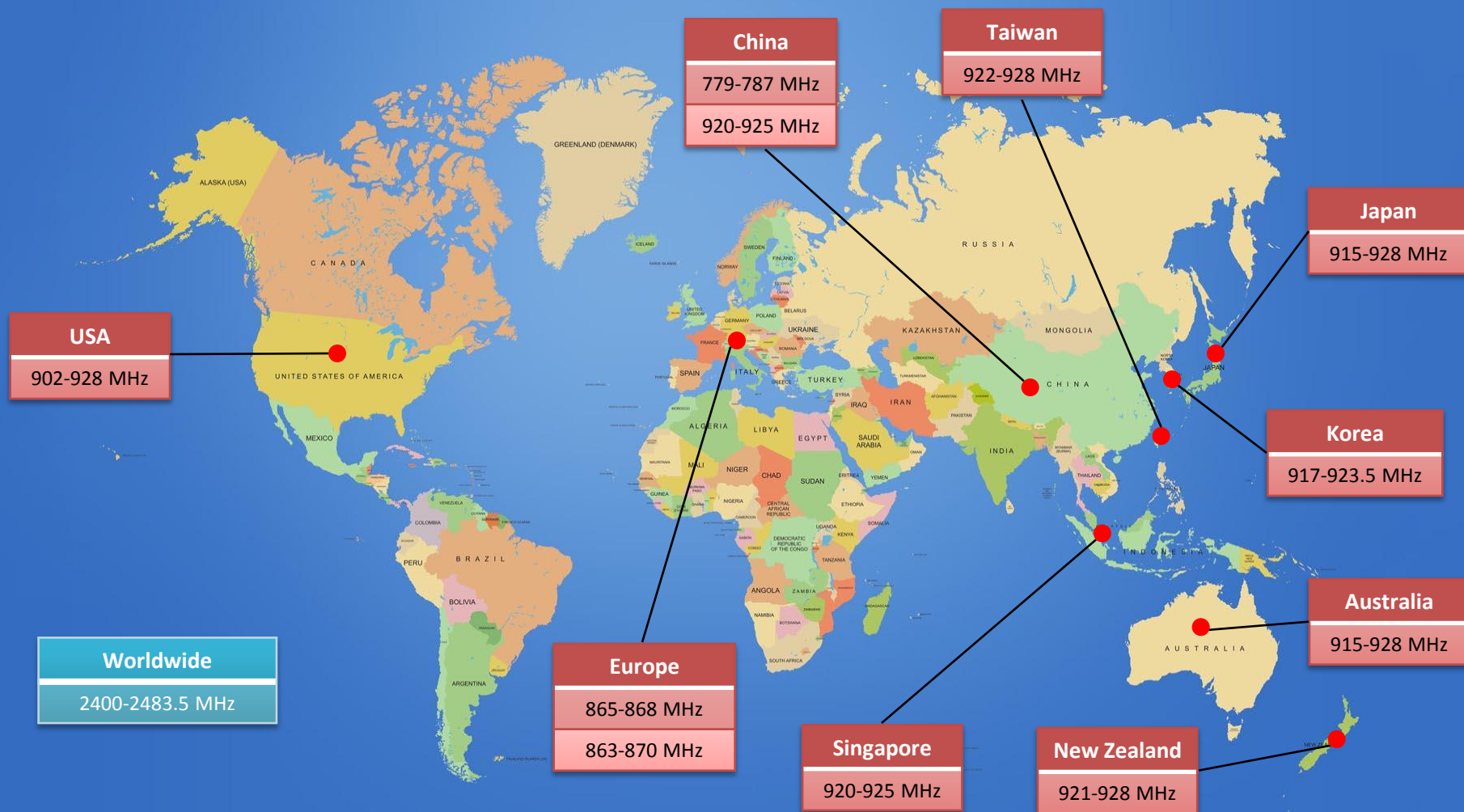
Background

- A utility company is working on the implementation of smart metering in Hong Kong
- Spectrum for smart metering being explored
 - 920 MHz band
 - 860 MHz band
- This presentation covers:
 - Deployment of spectrum for Radio Frequency Identification (RFID)/Short Range Device (SRD) worldwide for smart meter application
 - Current frequency assignment/allocation in Hong Kong in these bands

Frequencies for RFID/SRD applications worldwide (I)

Frequency Band	920 MHz Band	Other Bands
Country / Region	Australia China Japan Korea New Zealand Singapore Taiwan USA	China (779 - 787 MHz)
		Europe (865 - 868 MHz) (863 - 870 MHz)
		Worldwide (2400 - 2483.5 MHz)

Frequencies for RFID/SRD applications worldwide (II)



Equipment standards for RFID/SRD applications in Europe

Europe



Frequency Band	Application	Standard
865 – 868 MHz	RFID	EN 302 208
863 – 870 MHz	SRD	EN 300 220

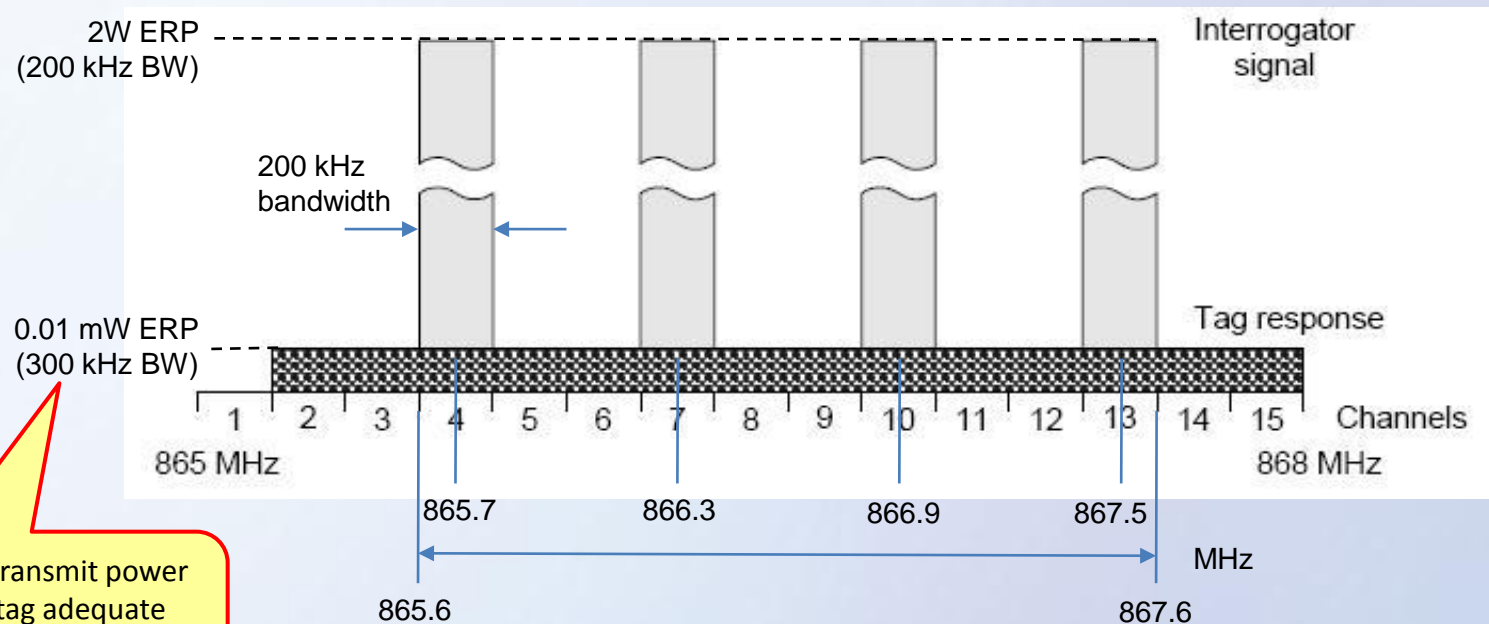
EN Reference Standard for 865 – 868 MHz

EN 302 208

Application

RFID

Frequency Range, Power and Channel Spacing



Is the transmit power of the tag adequate for smart meter application?

EN Reference Standard for 863 – 870 MHz

EN 300 220	
Application	SRD
Frequency Range	863 – 870 MHz
Power	25 mW ERP
Channel Spacing	≤ 100 kHz (for FHSS)

Is channel spacing of 100 kHz or less adequate for smart meter application?

- Is the transmit power adequate for smart meter application?
- Would there be interference to RFID implementation based on EN 302 208?

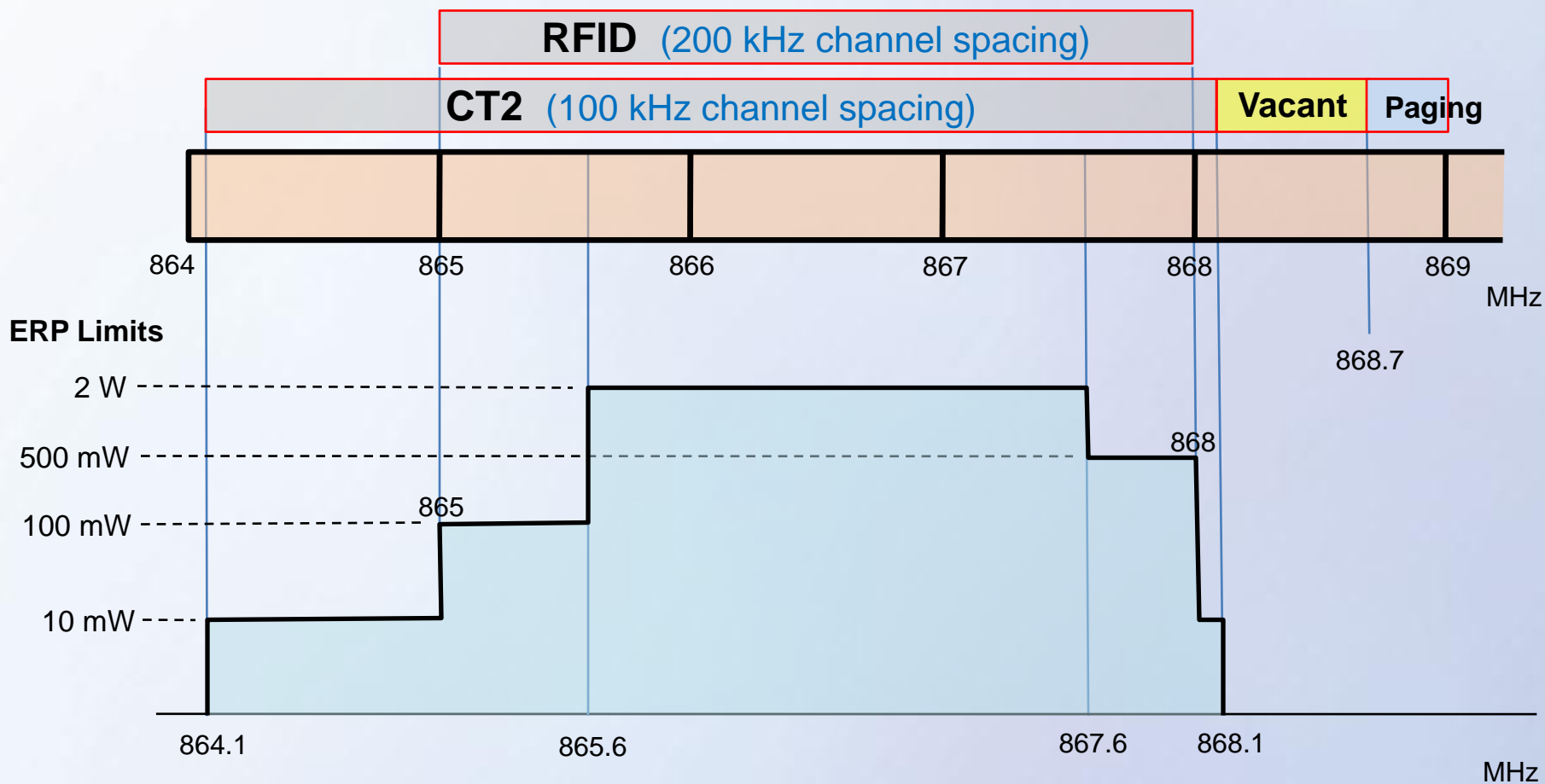
IEEE Reference Standard for 863 – 870 MHz

IEEE 802.15.4g	
Application	Smart Metering Utility Network
Frequency Range	863 – 870 MHz
Power	<ul style="list-style-type: none">• Transmitter shall be capable of transmitting at least 0.5 mW• Maximum transmit power is limited by local regulatory bodies
Channel Spacing	200 or 400 kHz (for FSK PHY) 200, 400, 800 or 1200 kHz (for OFDM PHY)

- What is the power level required for smart meter application?
- Would there be interference to RFID implementation based on EN 302 208?

Should channel spacing above 200 kHz, which does not meet the requirement of Cap 106Z, be allowed?

Hong Kong - Current Control under Exemption Order Cap 106Z on 864.1 – 868.1 MHz



Current Status of 860 MHz Band in Hong Kong

- Equipment operating at 864.1 – 868.1 MHz is exempted from licensing, subject to:
 - RFID operating at 865 – 868 MHz, max. emission ranging from 100 mW to 2 W according to ERP mask, channel spacing 200 kHz
 - CT2 operating at 864.1 – 868.1 MHz, 10 mW ERP max., channel spacing 100 kHz
- The band 868.1 – 868.7 MHz is vacant

Equipment standards for RFID/SRD applications in US

United States

Frequency Band	Application	Standard
902 – 928 MHz	Licence-exempted use (use frequency hopping (FHSS) or digital modulation)	FCC Part 15

FCC Reference Standard for 902 – 928 MHz

FCC Part 15 Section 15.247

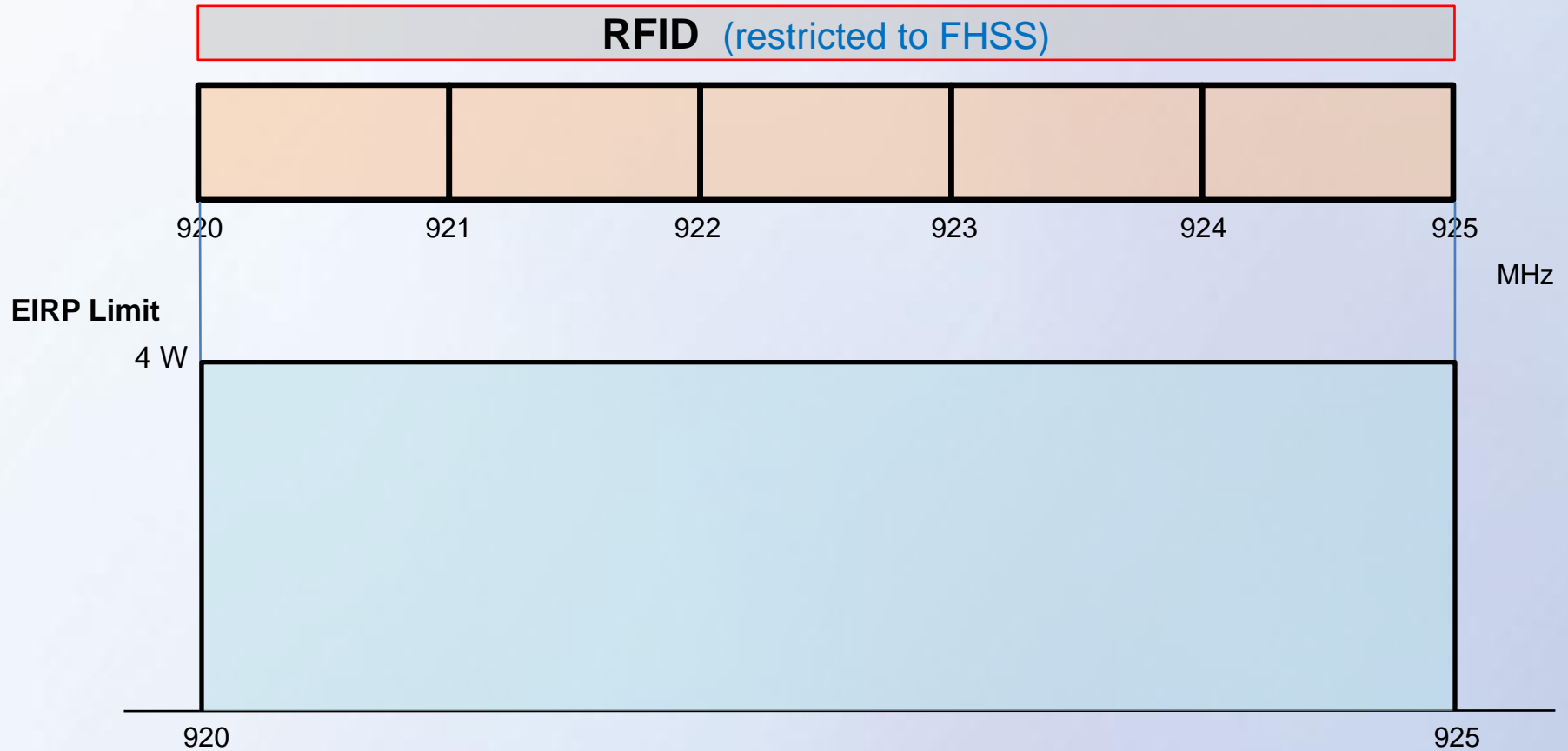
Application	Licence-exempted use
Frequency Range	902 – 928 MHz
Maximum Power	1 W transmitter power max. ≤ 6 dBi antenna gain → 4 W EIRP max.
Channel Spacing	500 kHz max. (20 dB bandwidth) (for FHSS system)

IEEE Reference Standard for 902 – 928 MHz

IEEE 802.15.4g	
Application	Smart Metering Utility Network
Frequency Range	902 – 928 MHz
Power	<ul style="list-style-type: none">• Transmitter shall be capable of transmitting at least 0.5 mW• Maximum transmit power is limited by local regulatory bodies
Channel Spacing	200 or 400 kHz (for FSK PHY) 200, 400, 800 or 1200 kHz (for OFDM PHY)

What is the power level required for smart meter application?

Hong Kong - Current Control under Exemption Order Cap 106Z on 920 – 925 MHz band



Current Status of 920 MHz Band in Hong Kong

- Equipment operating at 920 – 925 MHz is exempted from licensing, subject to:
 - RFID operating in 920 – 925 MHz, 4 W EIRP max., restricted to FHSS modulation

Summary of Considerations

❖ Spectrum aspect

- Need to consider potential interference to existing RFID implementation in the 860 MHz band based on EN 302 208

❖ Standards aspect

- EN 302 208 and EN 300 220 are compatible with Cap 106Z, but need to consider whether their power limits are adequate for smart meter application inside high rise buildings in Hong Kong
- IEEE 802.15.4g
 - For 860 MHz band, need to consider potential interference issue as mentioned above

Advice Sought

Members

Comment

- Deployment of spectrum for smart meters
- Any other views

Thank You