

The Swegon logo features the word "Swegon" in a bold, blue, sans-serif font. A small green leaf icon is positioned above the letter 'n'. The logo is centered on a white rectangular background.

# Swegon<sup>l</sup>

**Future trends, advanced  
control technologies**

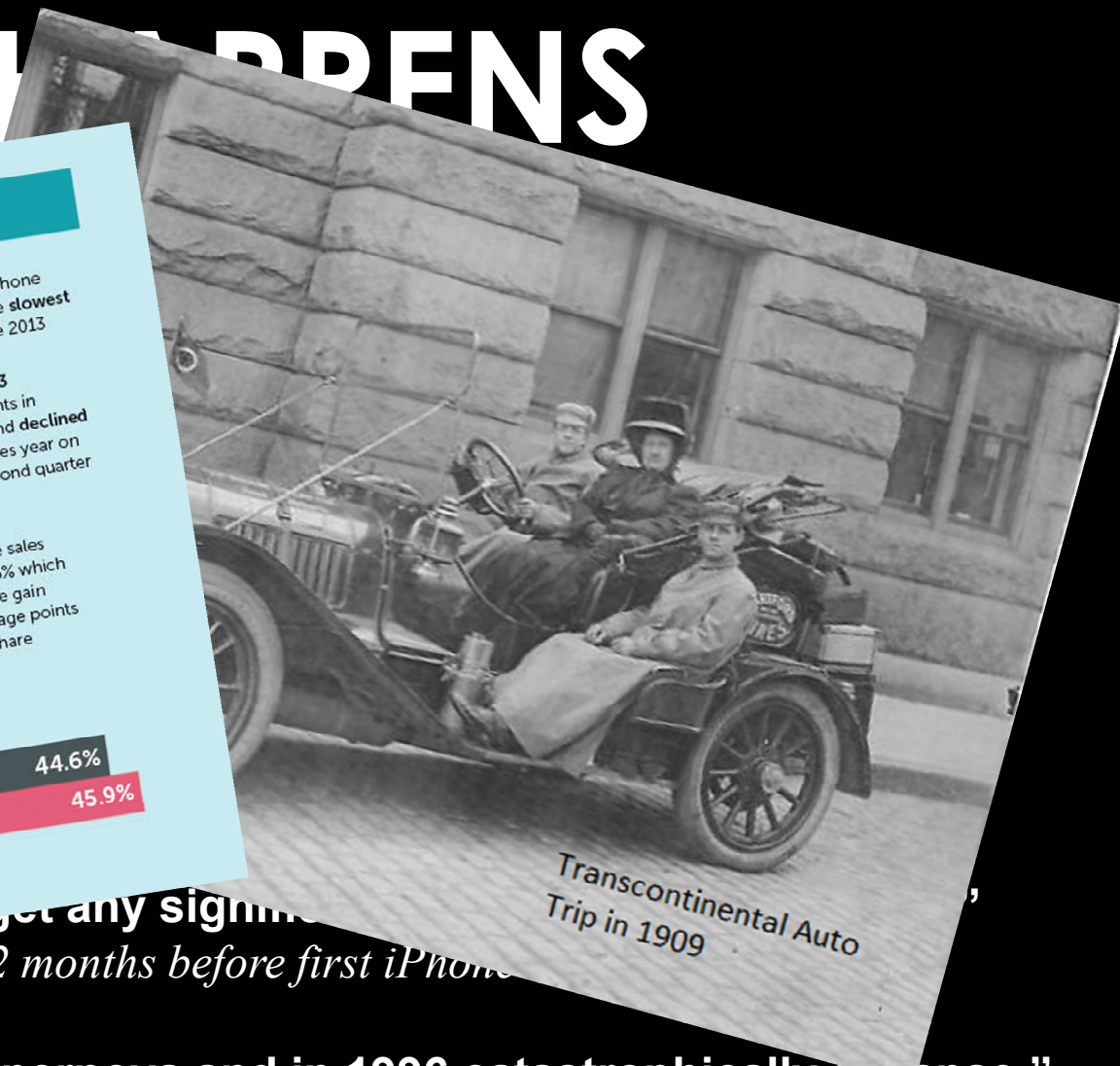
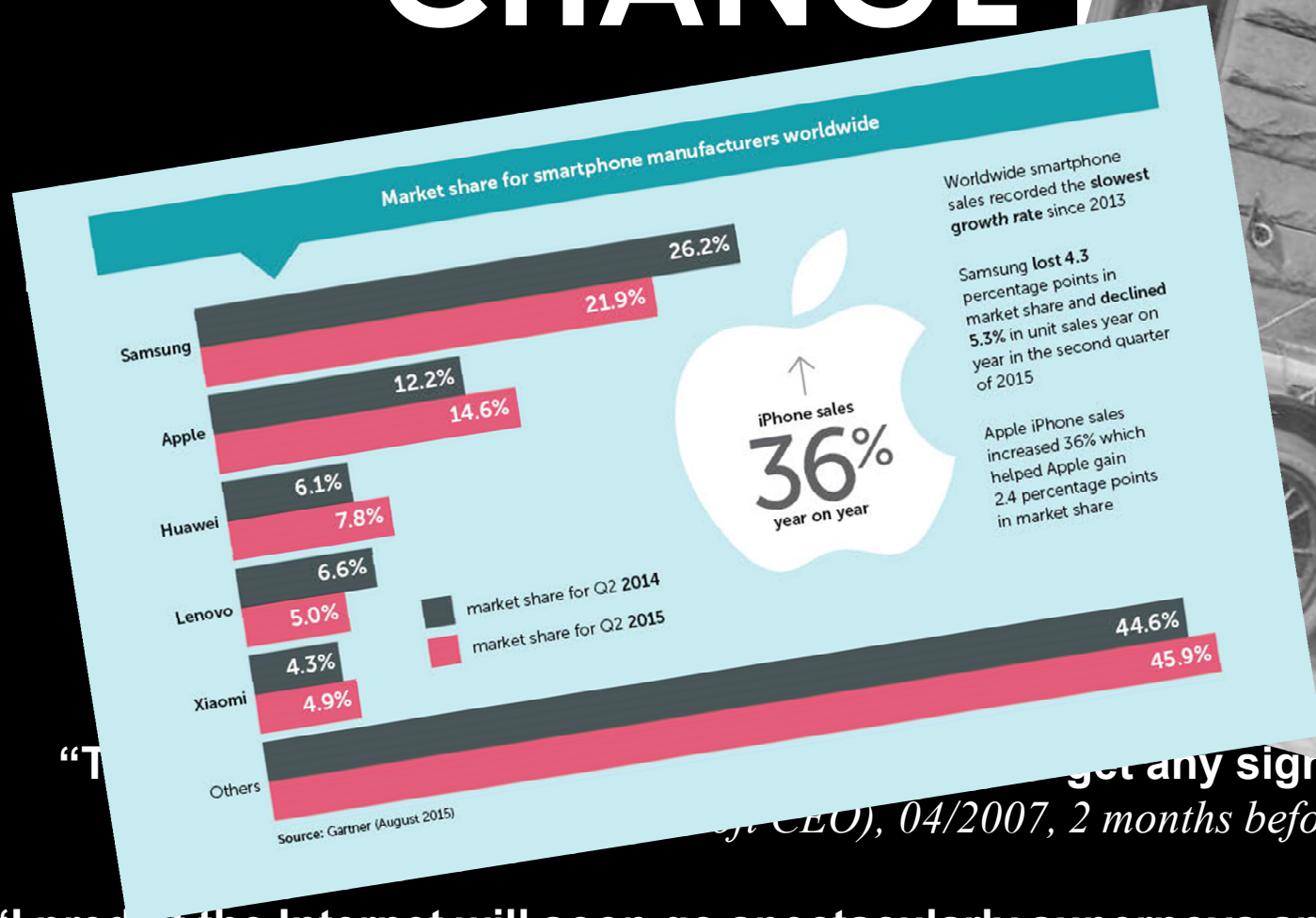
REHVA Seminar – ISH 2017

# CHANGE HAPPENS



...are you ready?

# CHANGE HAPPENS



“I predict the Internet will soon go spectacularly supernova and in 1996 catastrophically collapse.”

*Robert Metcalfe, Inventor of Ethernet, 1995*









# INTERNET OF THINGS

## Capabilities of Objects and Systems

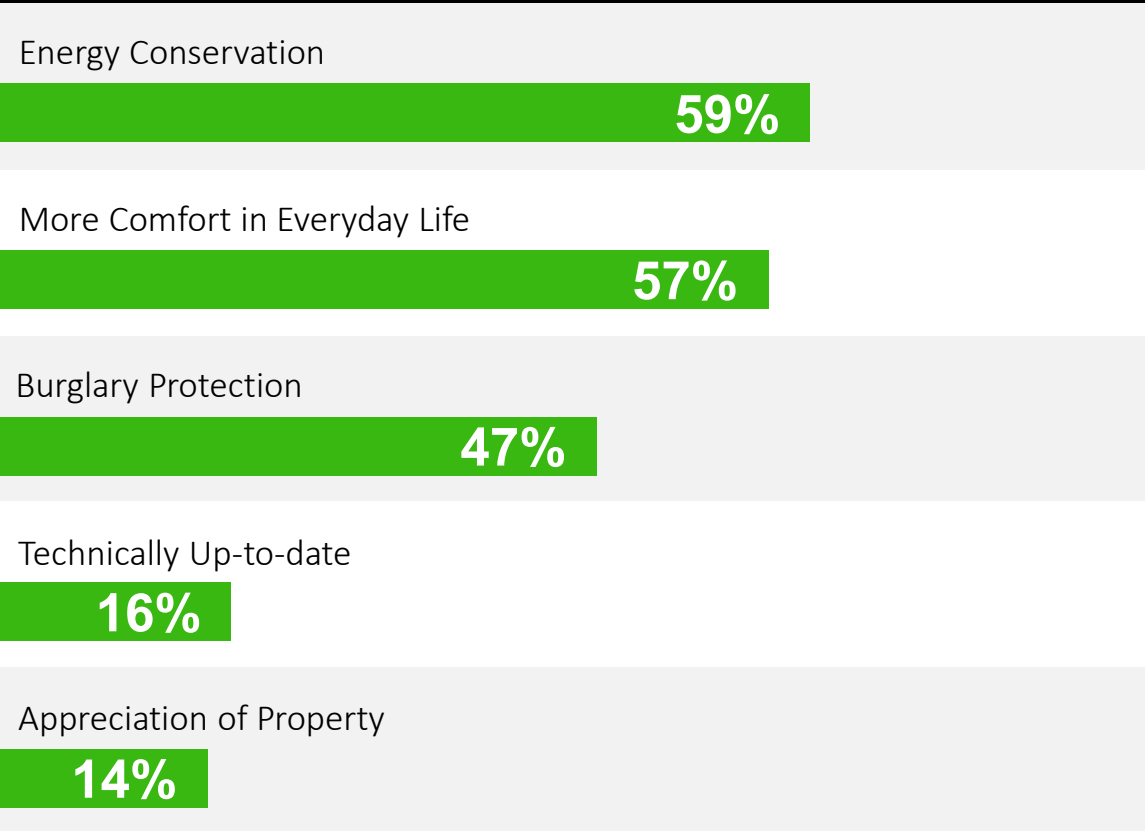
- **Embedded:** integration into human environment
- **Context awareness:** perception of the user's situational context
- **Personalization:** tailored to the user's needs
- **Adaptability:** changes depending on requirement
- **Anticipation:** foresees the user's request



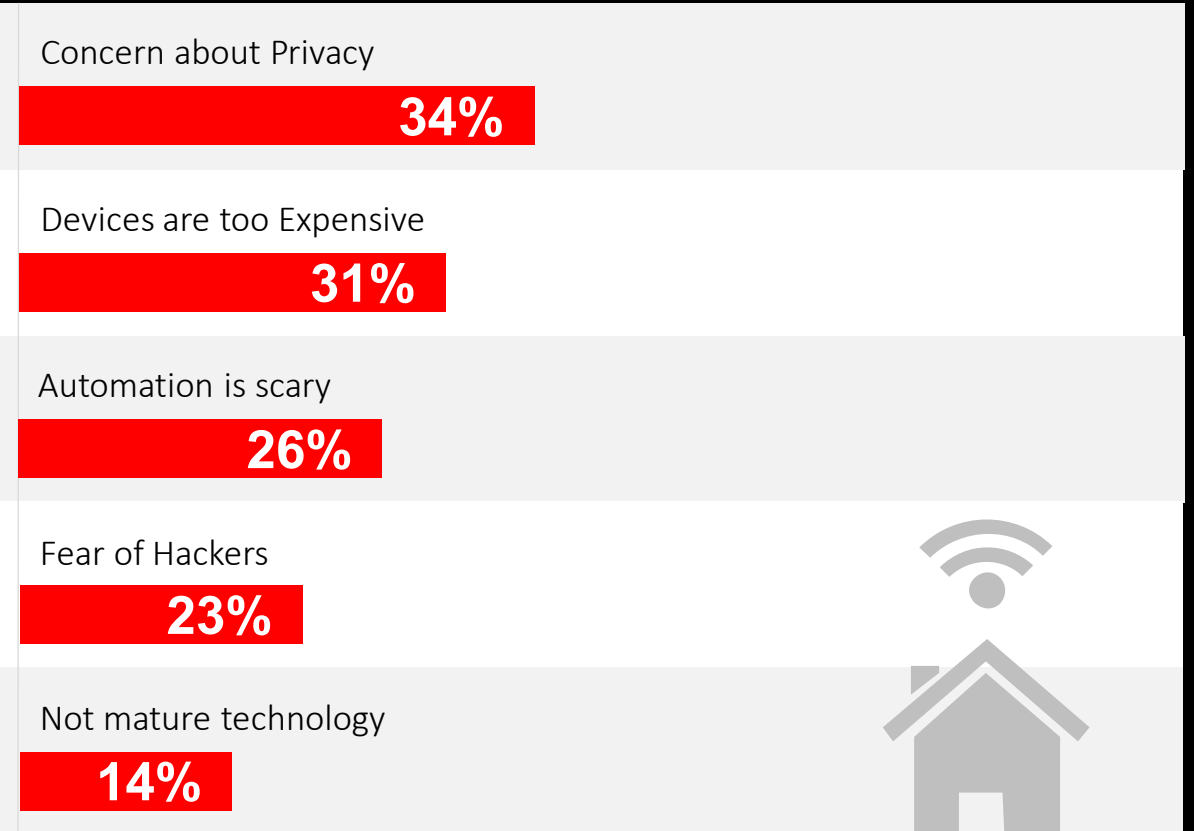


# APPLICATIONS

## Advantages of a Smart Home

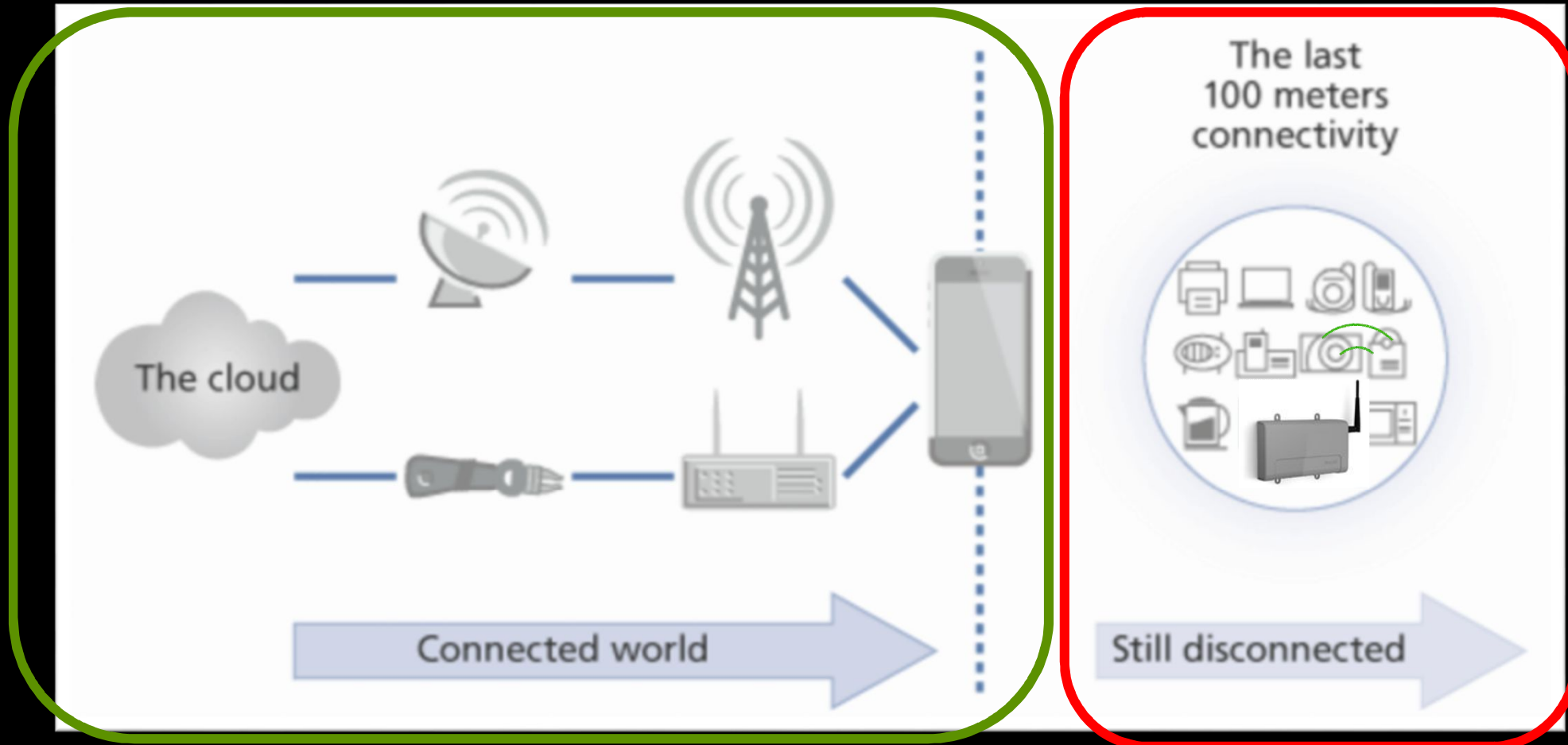


## Disadvantages of a Smart Home

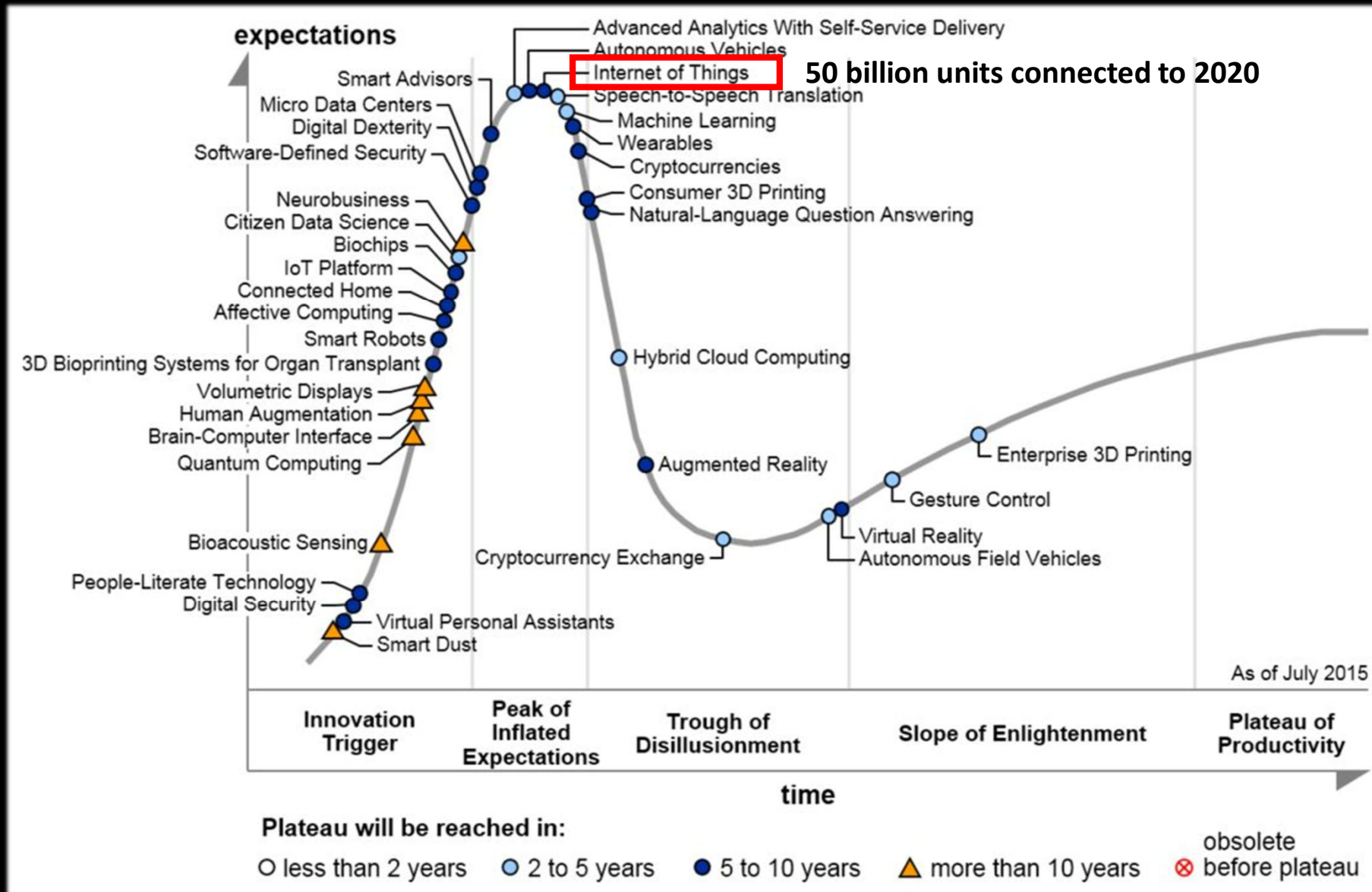


Source: Increase from the year 2015

# IoT in buildings



# Hype-Curve for new technologies





# Wireless Technology – Worlds most expensive asset

## UNITED STATES FREQUENCY ALLOCATIONS THE RADIO SPECTRUM

**RADIO SERVICES COLOR LEGEND**

AERONAUTICAL MOBILE	AMATEUR RADIO	BROADCASTING
AERONAUTICAL MOBILE SERVICES	LAND MOBILE	BROADCASTING SERVICES
AERONAUTICAL NAVIGATION	LAND MOBILE SERVICES	NAVIGATION
MARINE	MARINE MOBILE	RADIOCELESTRIAL
METEOROLOGICAL	MARINE MOBILE SERVICES	RADIOCELESTRIAL
METEOROLOGICAL	WIRELESS TELEVISION	RADIOCELESTRIAL SERVICES
METEOROLOGICAL SERVICES	METEOROLOGICAL AIR	SPACE RESEARCH
METEOROLOGICAL SERVICES	METEOROLOGICAL SERVICES	SPACE RESEARCH
NAVY	MOBILE	SPACE RESEARCH AND THE SATELLITE
NAVY SERVICES	MOBILE SERVICES	SPACE RESEARCH AND THE SATELLITE SERVICES

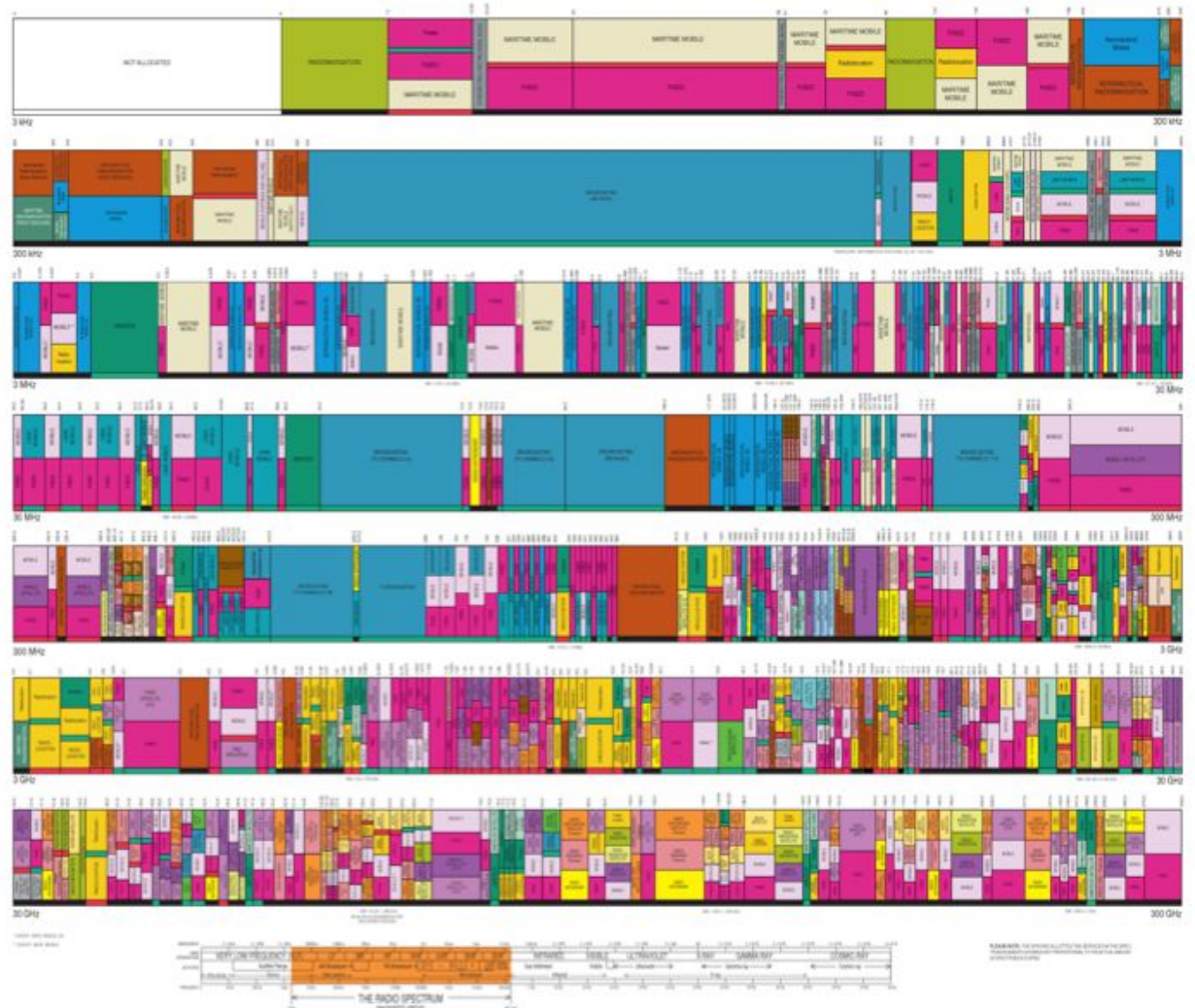
**ACTIVITY CODE**

FEDERAL GOVERNMENT	EXEMPT FROM GOVERNMENT REGULATION
NON-FEDERAL GOVERNMENT	

**ALLOCATION USAGE DESIGNATION**

SYMBOL	EXAMPLE	DESCRIPTION
F	F1D2	Fixed
M	M22	Mobile
N	N1	Naval
S	S1	Space Research
T	T1	Terrestrial
U	U1	Unrestricted
V	V1	Variable
W	W1	Wireless
X	X1	Experimental
Y	Y1	Yield
Z	Z1	Zonal

© 2008 U.S. DEPARTMENT OF COMMERCE, National Telecommunications and Information Administration, Office of Spectrum Management, October 2008



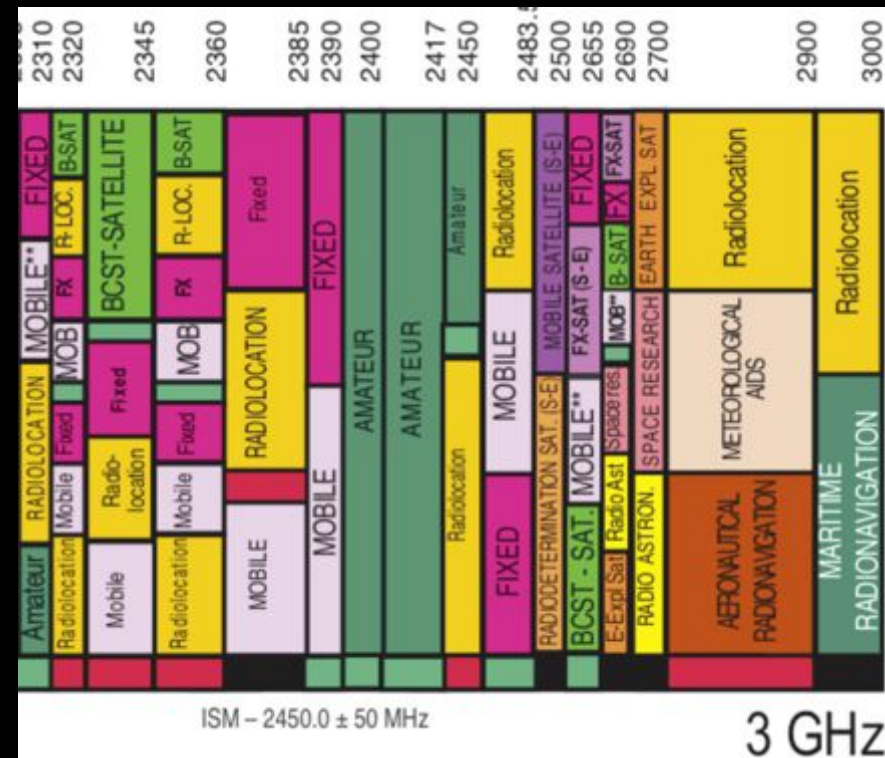
# Wireless Technology – 2,4 GHz worldwide license free band

And 2.4GHz is brilliant...

- It's a worldwide license free band, meaning that anyone can use it.

But there's a problem...

- it's a worldwide license free band, which means that EVERYONE can use it!



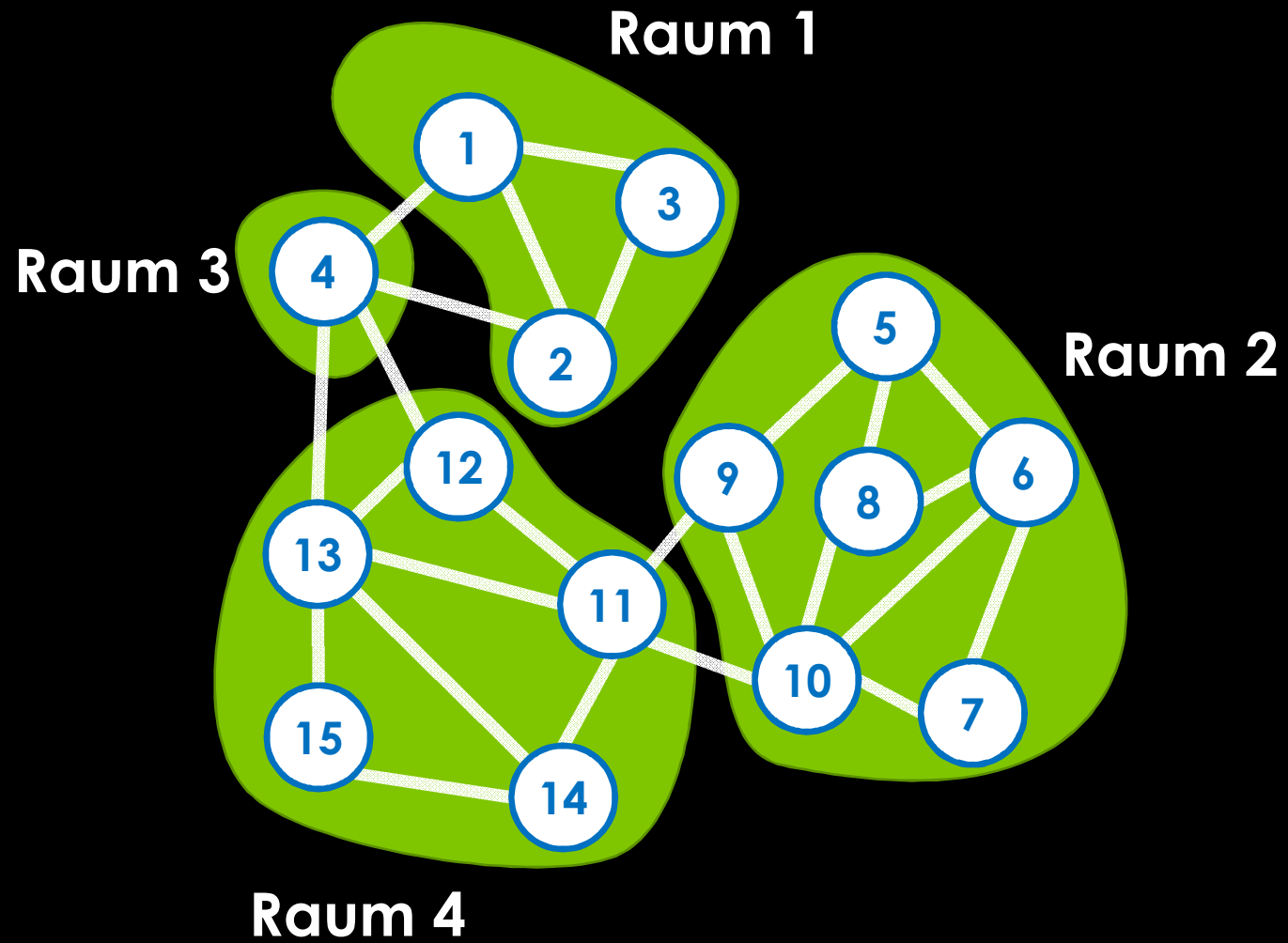
# Frequencies – we are not alone



# Frequency Shift



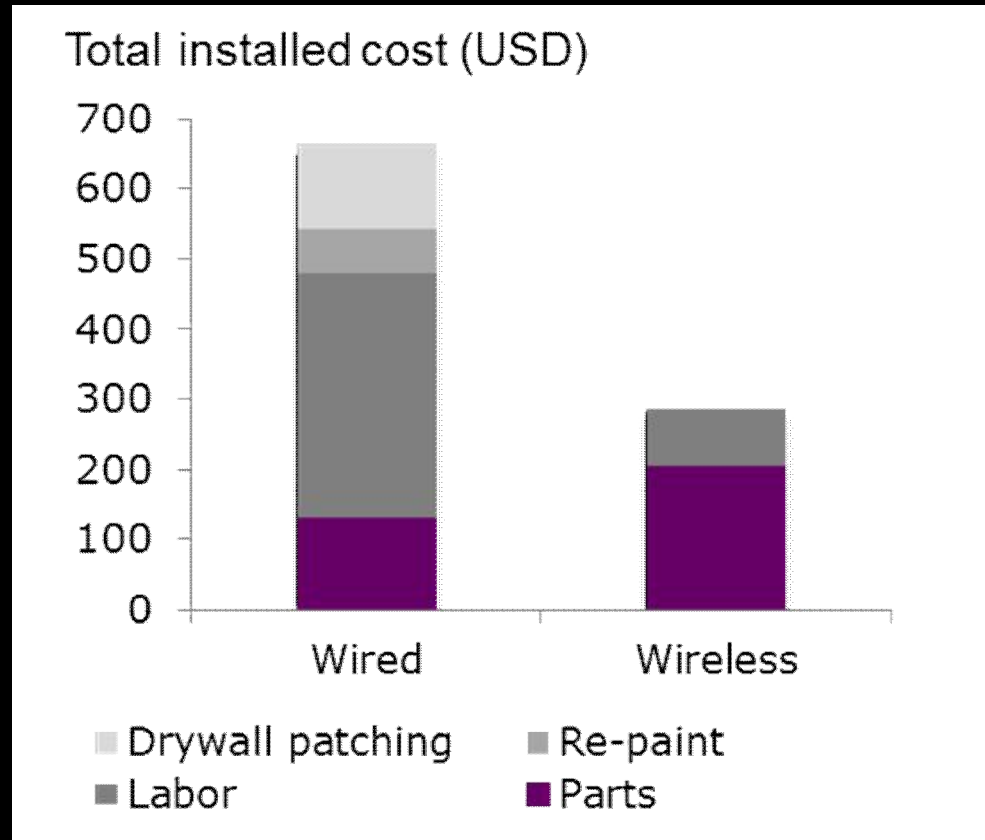








# Wireless Technologies – *Why?*



Wireless communication gives significant lower cost for:

- Installation
- Commission

More flexible:

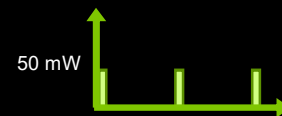
- Installation
- Application

# Radiation – Practical example

**Mobiltelefon**  
6 W  
0,01 m



**Wifi-router**  
0,1 W  
1 m  
Continuous traffic

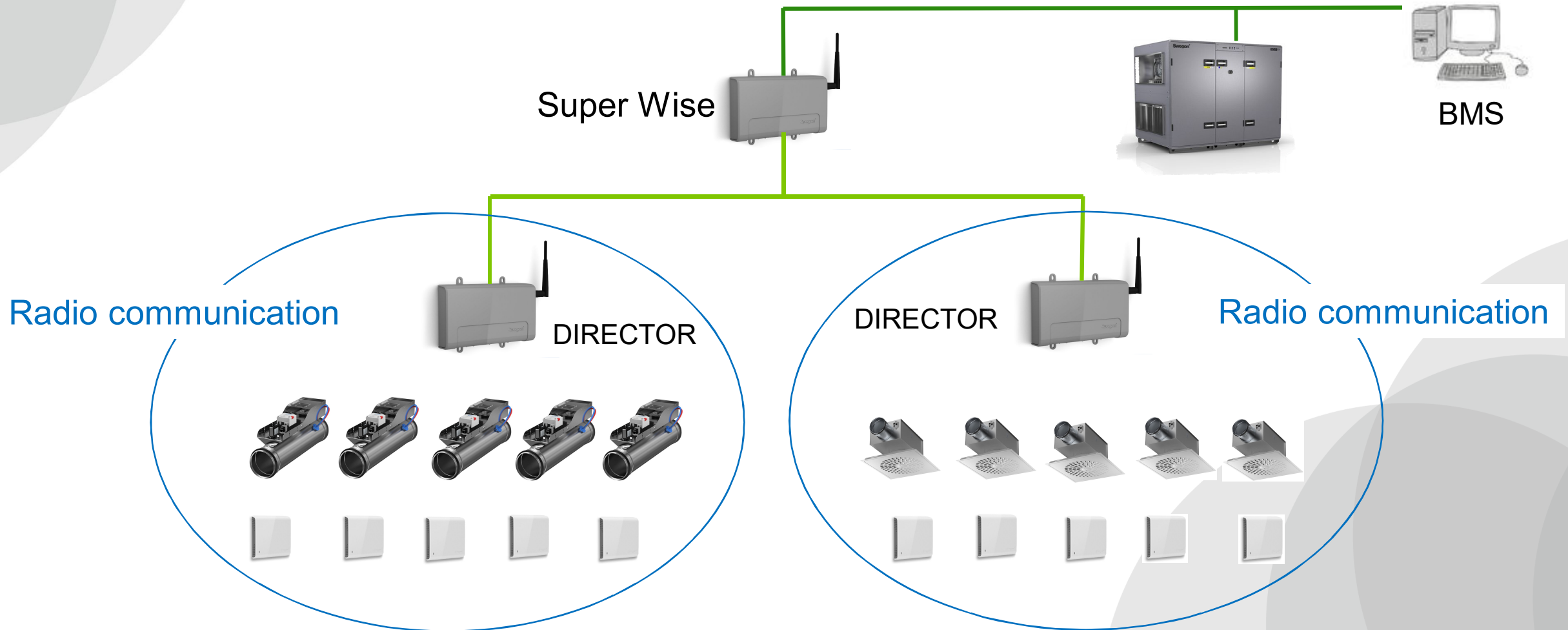


**WISE-node**  
0,05 W  
1 m  
1 s trafik / minute

A mobile talk for **2½ minutes** is equivalent to:

**150 000 minutes** of exposure to Wifi-router  
**90 000 000 minutes** of exposure to the WISE-nod

# New Wise - Topology



**Swegon**  
Svalans Hotell och Konferens

- Hem
- Planvy
- Systemvy
- Larm
- Grafer
- Schema
- Optimering
- Grupper
- Driftsättning
- Dokumentation
- Inställningar
- Användare
- Rickard K
- Logga ut

LB01
Zon 1
Rum 33
Alla produkter
Rensa
i

Temperatur °C
Våning 1 2 3 4 5 6 7 8 9 10

Rum 34 ↔ Flödesbild

Anteckningar ☰ Ändringslogg

**Sammanfattning**

20.5°

Temperatur

Närvaro

Värme / Kyla

CO<sub>2</sub>

Forcering

11%

Luftkvalitet

**Luftflöden**

→ 500 l/s (510)

← 511 l/s (510)

**Temperatur**

Kylbörvärde närvaro	23 °C
Värmebörvärde närvaro	21 °C
Kylbörvärde ekonomi	25 °C

Spara
Ångra

Located in the center of Stockholm.

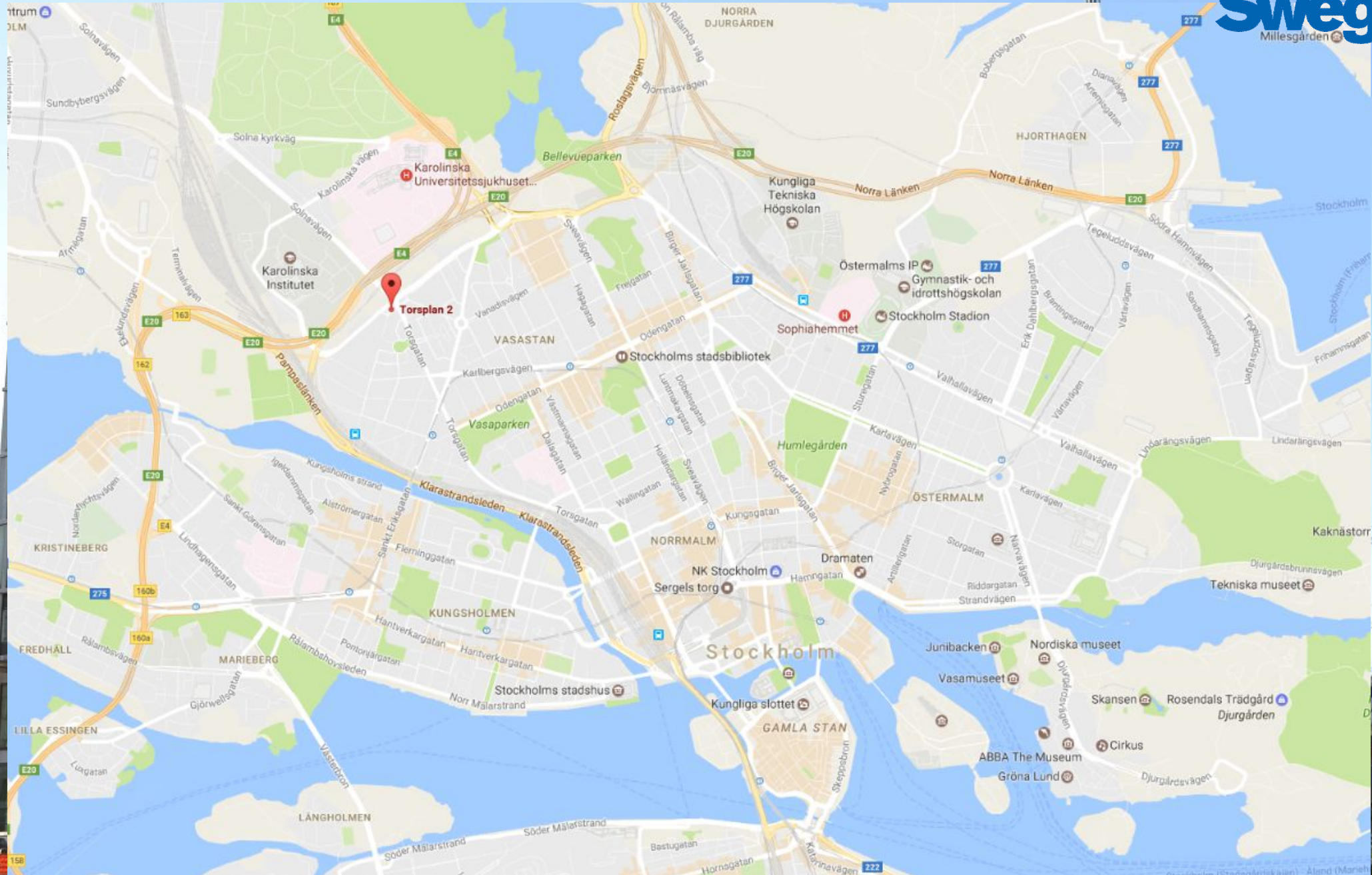
Office area: 18 500 m<sup>2</sup>.

Commercial area: 3 500 m<sup>2</sup>



Product	Number
Wise Colibri Ø 160	114
Wise Colibri Ø250	906
Wise Damper	26
User Interface	360





*May the*  
**FREQUENCIES**  
*be with you*



# What about radiation? Aren't there huge health risks with this?

- There are **no scientifically based evidence about any health risks** related to exposure of radio waves from wireless computer networks.
- The Swedish Radiation Safety Authority has measured the exposure to radio waves in school environments. The result from these measurements shows that the exposure is very low, **less than one hundred thousandth of what is necessary to cause a proven health effect**
- Even so, we took this into consideration when designing the system so that:
  - The system is transmitting with low power output but enables reliable communication by using a technology that makes the system “good at listening
  - The system is on average only transmitting every thirty seconds, when information is transferred and with no transmission in between

