

Cellular IoT Devices

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REQUIREMENTS ON CELLULAR CONNECTIVITY FOR IOT

Low complexity low cost device



Sensors, actuators, and similar devices, Usually do not require the wideband operation of LTE.

Long (10+ years) battery life



Devices are often battery-powered and battery life needs to last at least the device life-time.

Extended (+20dB) coverage



For devices located in rural area, deserted area, or basement of a building.

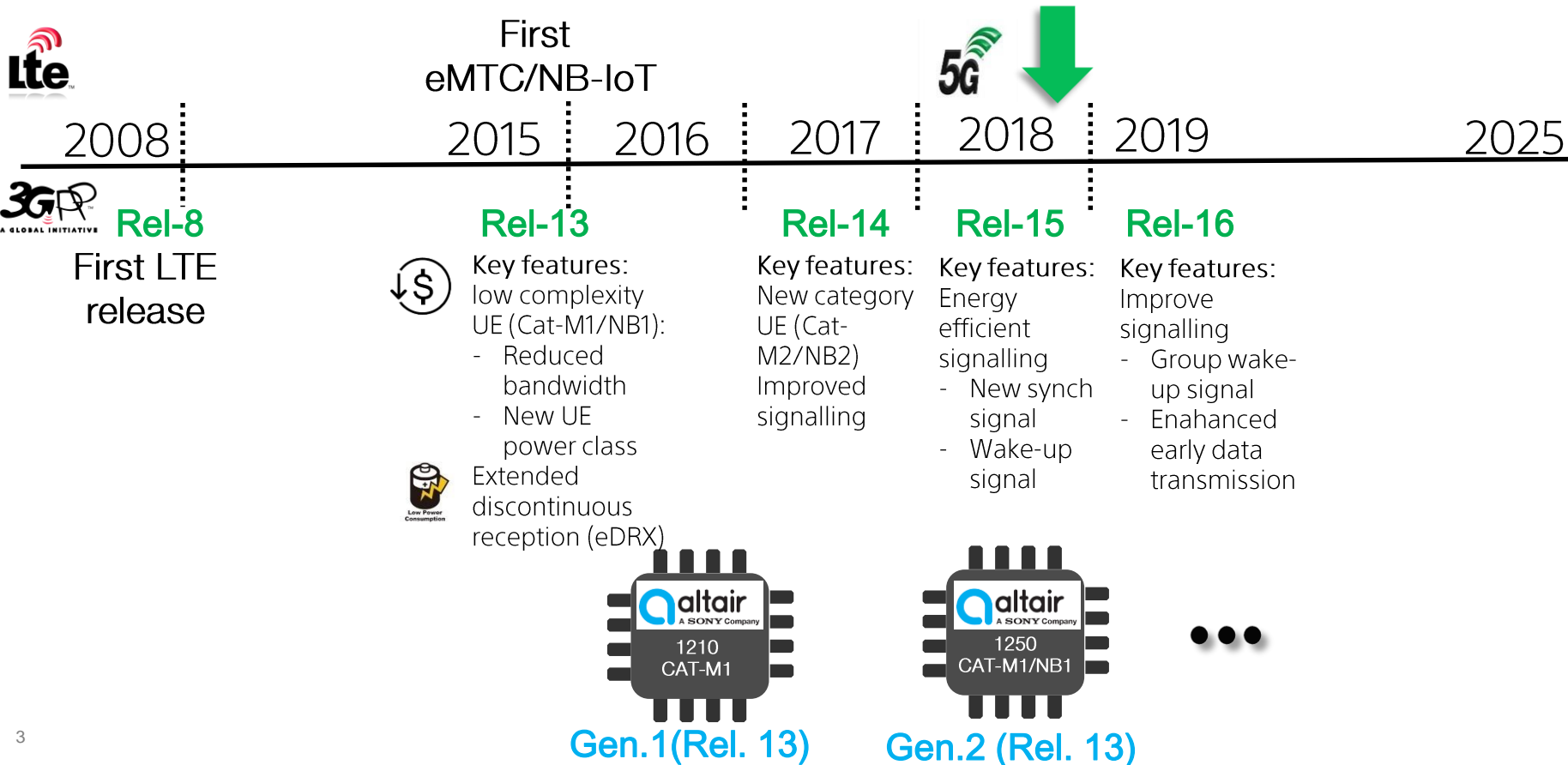
Massive number of devices



Covering all types of communication between machines.

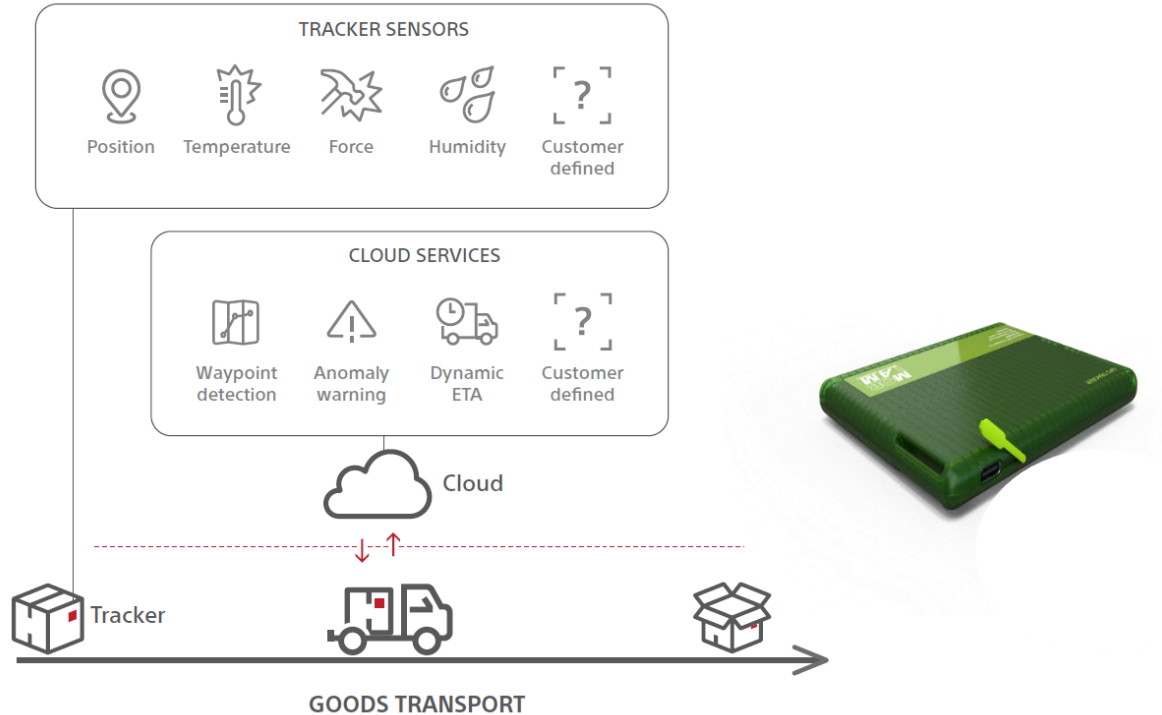
EVOLUTION OF CELLULAR CONNECTIVITY FOR IOT

We are here



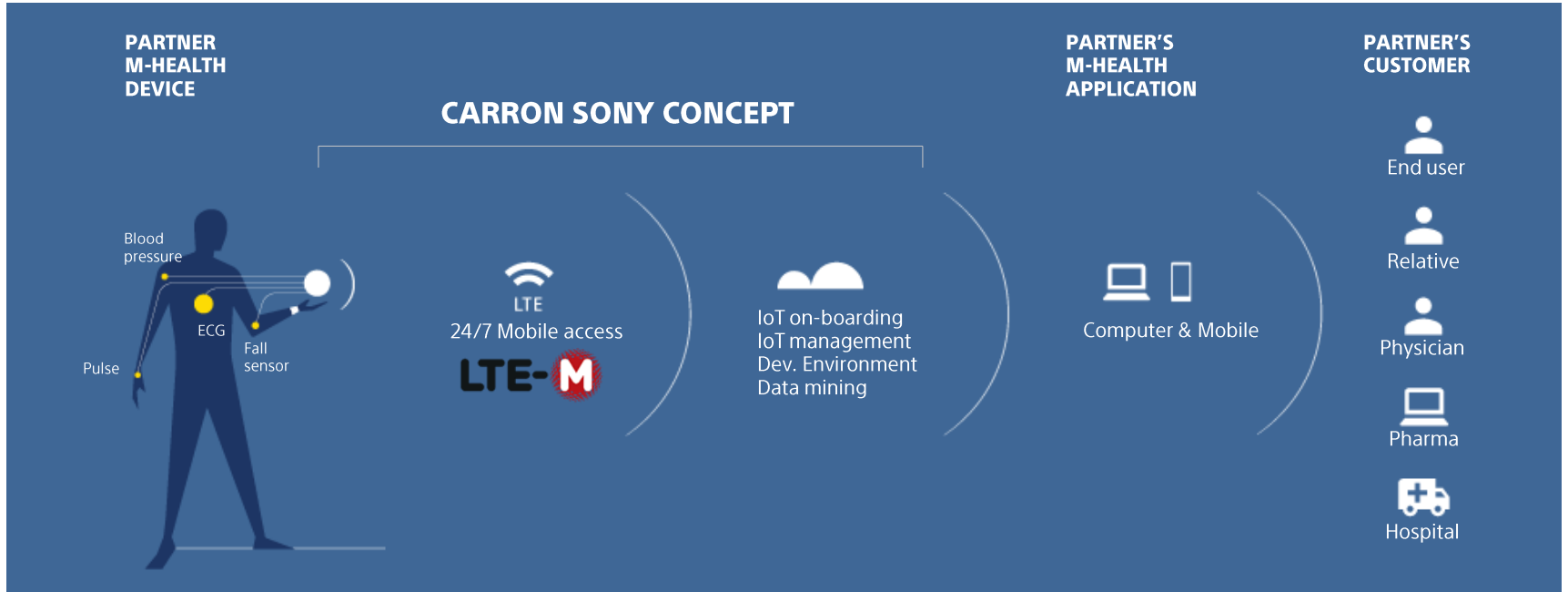
LOGISTIC and TRANSPORTATION - MOBIAM

Improved efficiency in transportation and tracking solutions

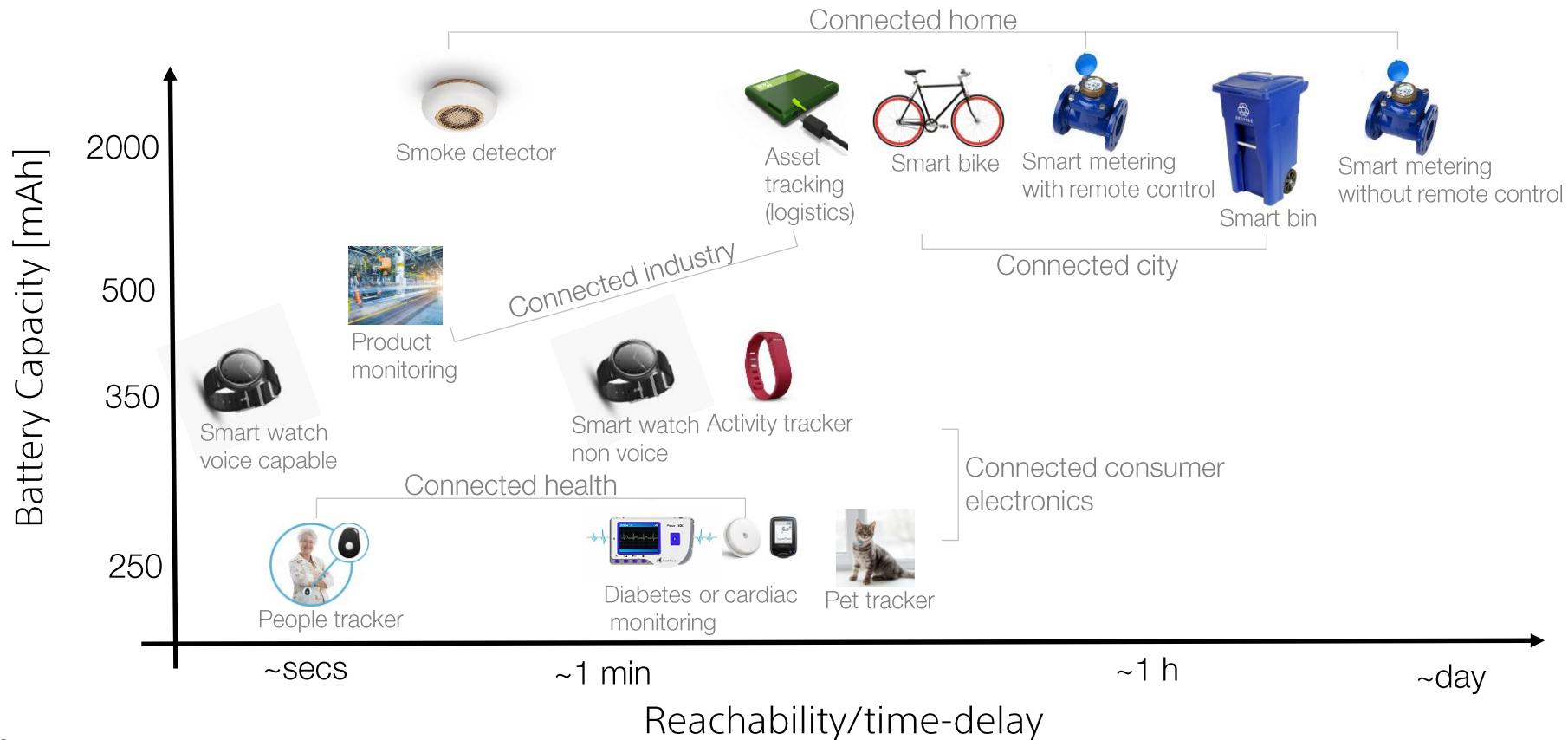


HEALTH and WELLNESS - CARRON

A platform for M-health

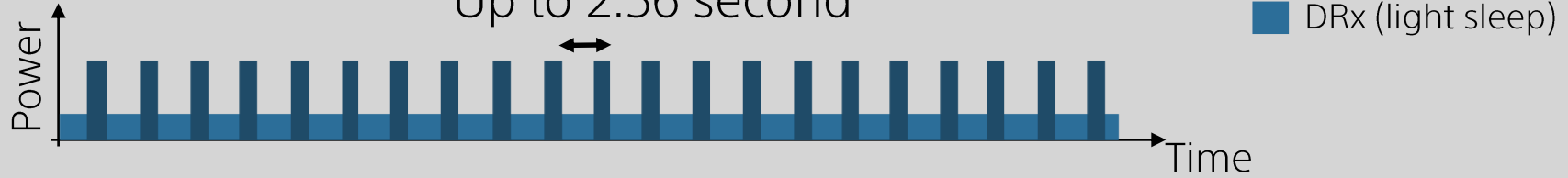


CELLULAR IOT USE CASES - EXAMPLES



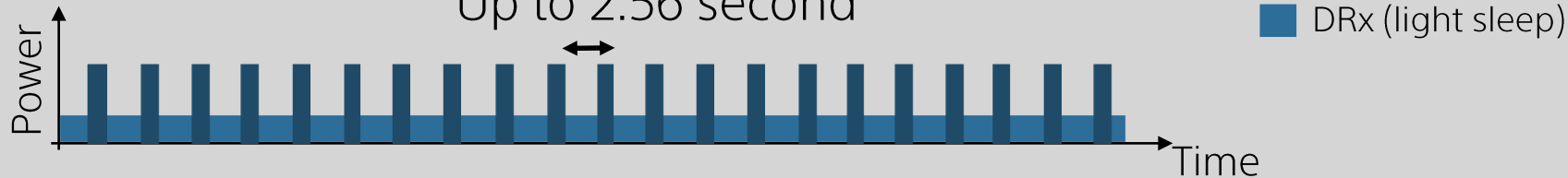
EXISTING POWER SAVING FEATURES

Discontinuous Reception (DRx)
Up to 2.56 second

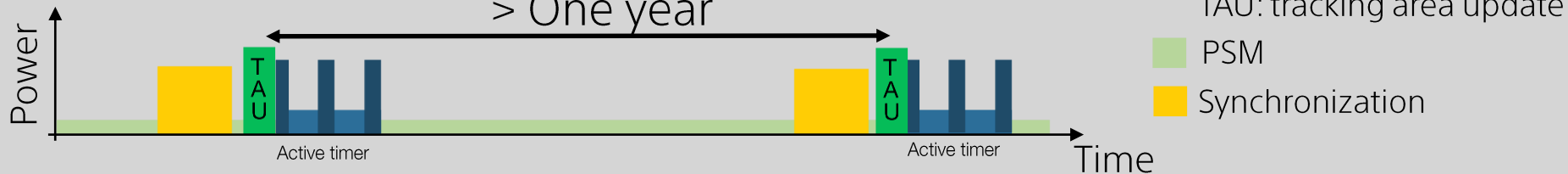


EXISTING POWER SAVING FEATURES

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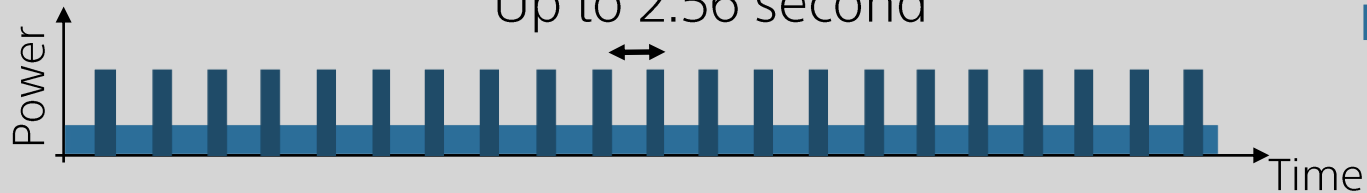


Power Saving Mode (PSM) – Rel. 12
> One year

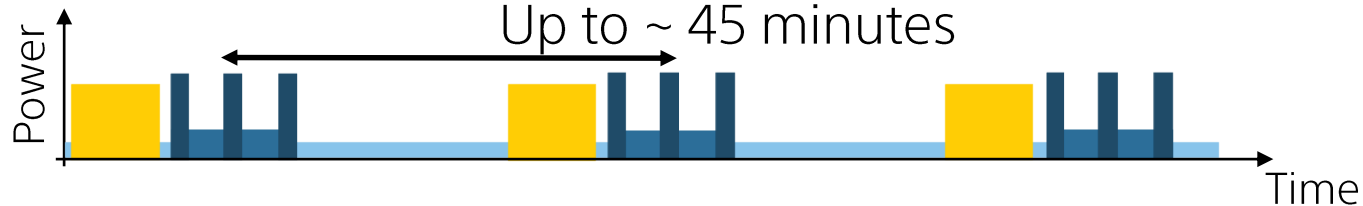


EXISTING POWER SAVING FEATURES

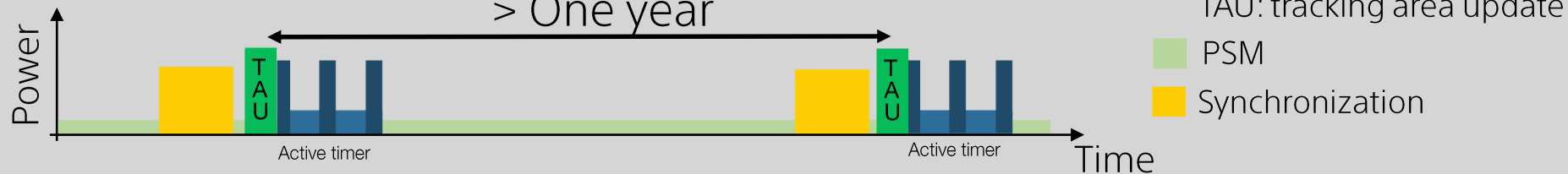
Discontinuous Reception (DRx)
Up to 2.56 second



Extended DRx (eDRx) – Rel. 13
Up to ~ 45 minutes

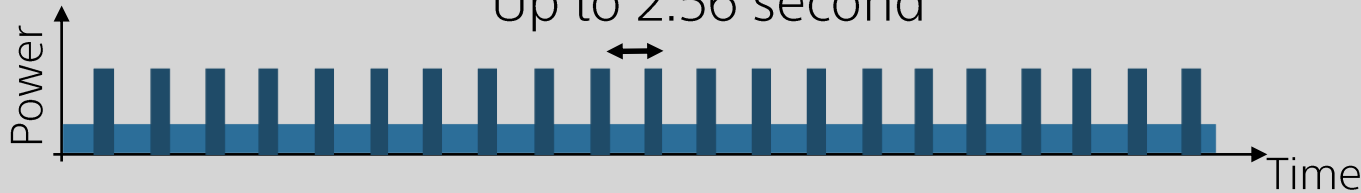


Power Saving Mode (PSM) – Rel. 12
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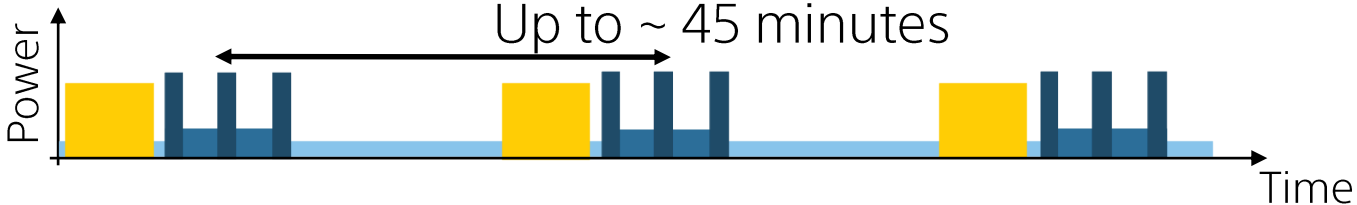


EXISTING POWER SAVING FEATURES

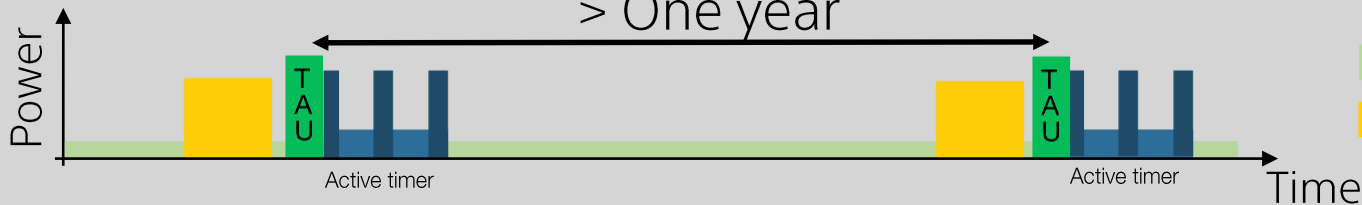
Discontinuous Reception (DRx)
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Extended DRx (eDRx) – Rel. 13
Up to ~ 45 minutes



Power Saving Mode (PSM) – Rel. 12
> One year



- Receive mode
- DRx (light sleep)

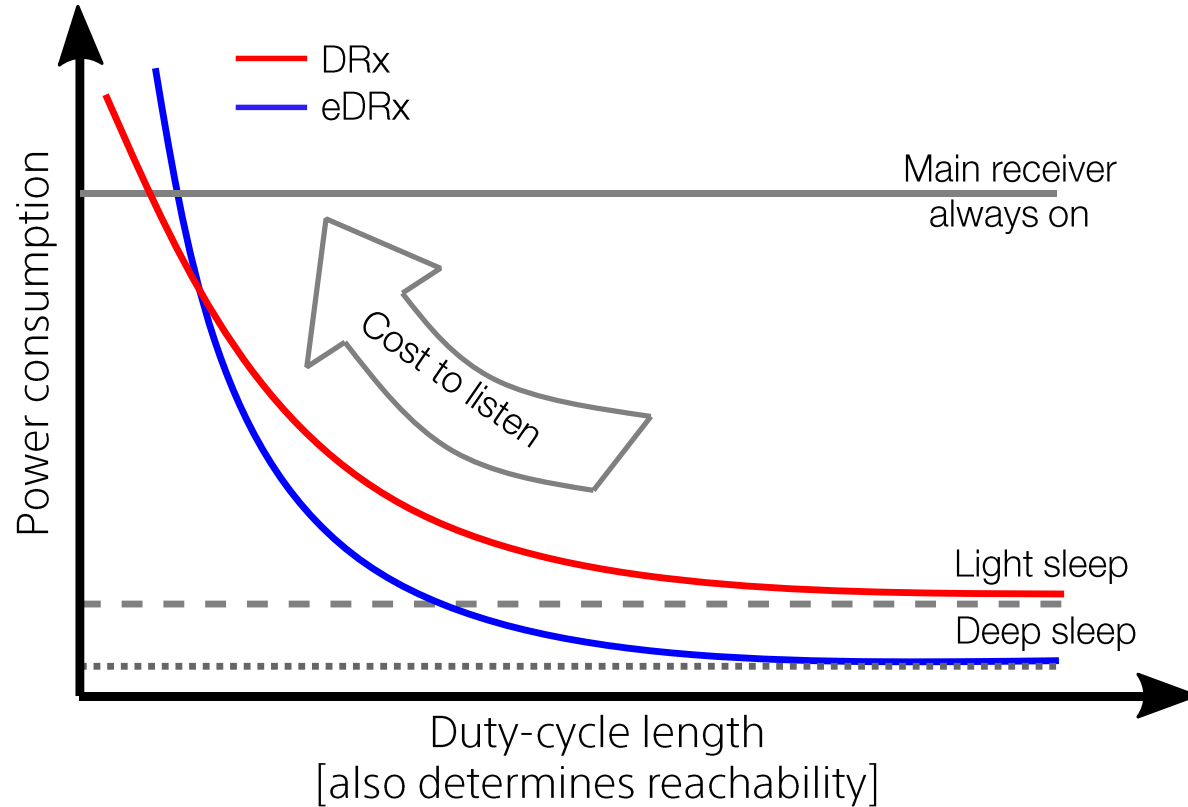
Better reachability

- eDRx (deep sleep)

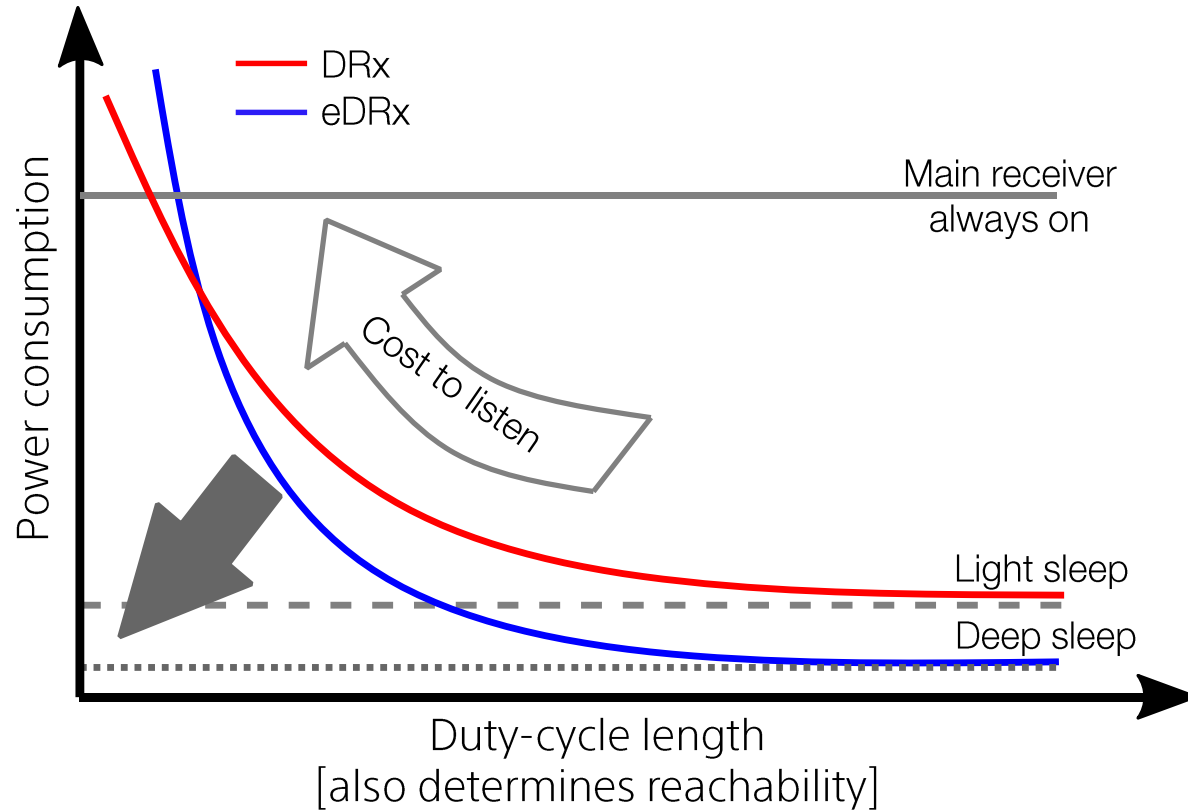
Longer battery life

- Uplink transmission
- TAU: tracking area update
- PSM
- Synchronization

POWER CONSUMPTION CHARACTERISTICS

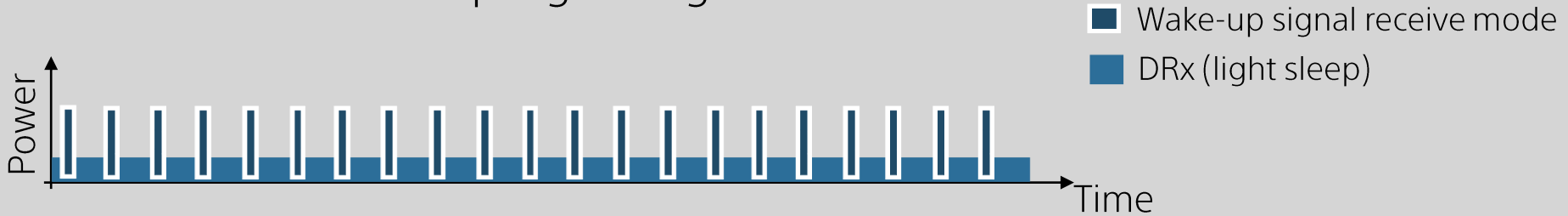


POWER CONSUMPTION CHARACTERISTICS

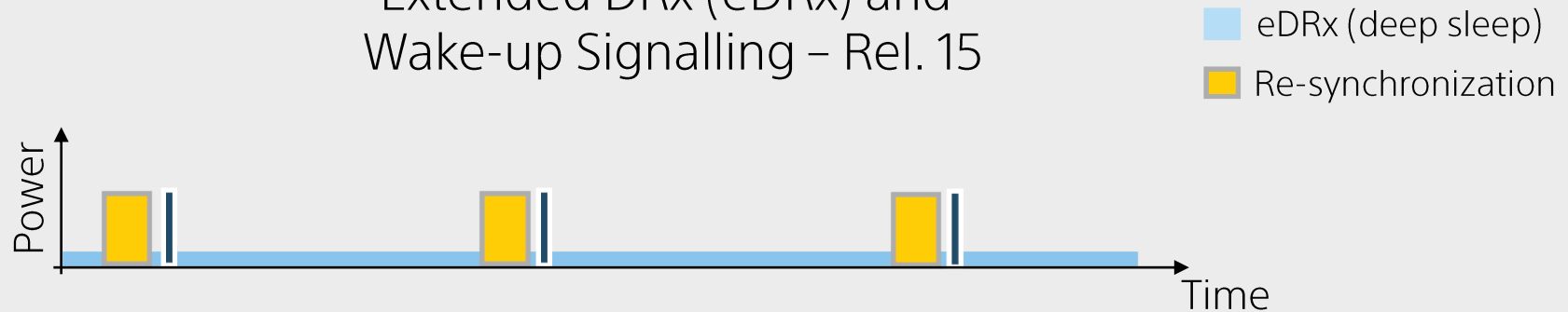


EXISTING POWER SAVING FEATURES (Cont.)

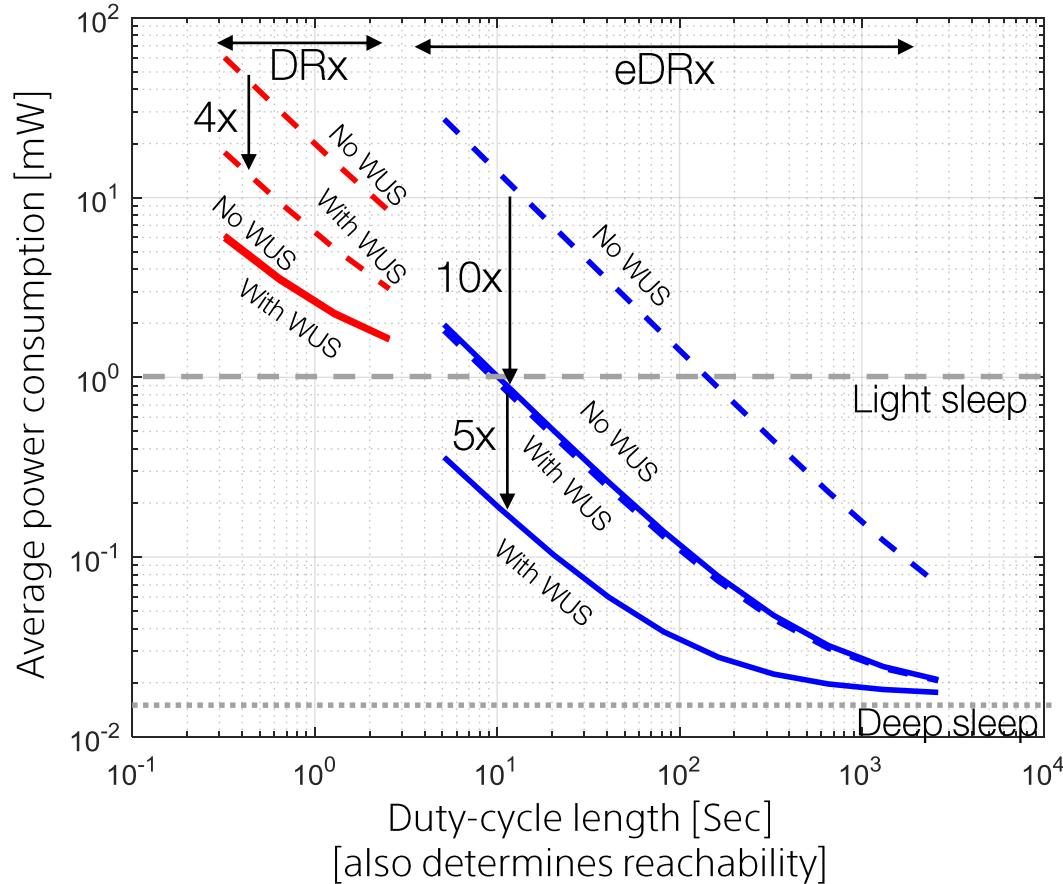
Discontinuous Reception (DRx) and Wake-up Signalling – Rel. 15



Extended DRx (eDRx) and Wake-up Signalling – Rel. 15



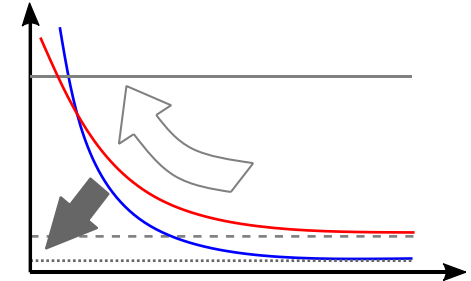
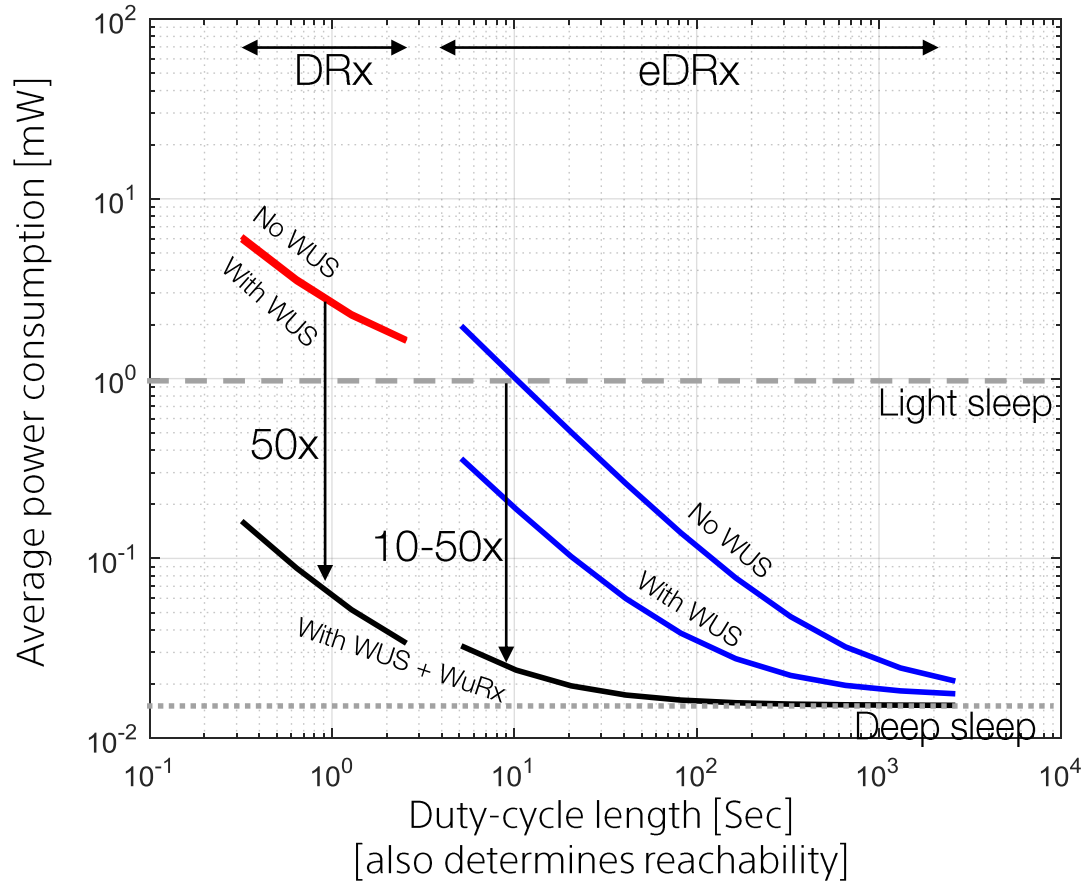
POWER CONSUMPTION OF EXISTING SCHEMES



- Normal coverage
- - Extended coverage



HOW MUCH AND WHEN/IF WAKE-UP RECEIVER SAVES?



SUMMARY

- ❑ *Existing feature(s)*: Power saving features such as power saving mode (PSM), extended discontinuous reception (eDRX), and wake-up signalling enable connectivity and long battery life for mobile originated applications and/or delay-intolerant device-terminated applications.
- ❑ *Future feature*: A use of an extra low-power wake-up receiver as an assistance to the main receiver can enable connectivity and long battery life time for use-cases with tight requirement on device reachability.

