

Agenda Item: 10.11.13.2

Source: Veolia

Document for: Decision

Revision of RP-171005

Motivation for accelerating NB-IoT work in 2017

UTILITY USE CASES FOR IoT



WATER

Management of the global
water cycle,



WASTE

Liquid and solid non-hazardous and
hazardous waste management



ENERGY

Energy efficiency, efficient
management

Smart Water Metering is a most challenging use case:

Typical Requirements for Smart Water Meter:

- 15 years UE battery life (long term contract)
- 100 bytes payload twice a day
- Non-latency sensitive
- Deep Indoor coverage
- 164 dB MCL



Benefits/Challenges of Smart Water Meter

| NB-IoT Core Values | Smart Water Meter Use Case | Benefits & Challenges |
|----------------------------|---|-----------------------|
| Coverage | Easy deployment No full coverage needed Only Local and on demand Millions of devices | +++ |
| Power Consumption | 15 years (long term contract) | -- |
| Low cost chipset/module | Battery*: 40% cost of the overall device | - |



Power Consumption
paramount
for
Smart Water
Metering

* Need to fit with performances and business model

**Smart Water Metering is an ideal IoT use cases for operators,
but Power Consumption needs to be adapted to the market demand
and to fit with the business model,**

The battery challenge

Battery Requirements for Smart Water Meter:

- Able to work more than 15 years (no self discharge)
- Adapted Size and Performances
- Adapted to business model

Such batteries already exist and have been proved matching these requirements with existing LPWA technologies (non 3GPP).

Battery life simulation for NB-IoT:

- Current battery life simulations for NB-IoT are optimistic if compared with results obtained in the field with other LPWA technologies for 15 years (strong impacts due to max peak rate to be supported & duration)
- Realistic battery conditions should be used to assert NB-IoT real performance.
- Efficiency Factors (temperature, current peak, duration pulse, PA efficiency...) need to be included – efficiency factors are deteriorating the performances from 30% to 50% compared to theoretical simulation.

Battery Life simulation based on experience

- Battery life simulation (in years)

| | R13 | R14 | R14+power consumption R15*** |
|--------------------|-------|-------|------------------------------|
| Theoretical * | 11-13 | 13-16 | 16-20 |
| Veolia Analysis ** | 8-10 | 10-13 | 13-17 |

* Based on simulations conducted with several partners (for In-band deployment scenario)

** Based on Veolia simulations and return of 10+y experience from field tests with other LPWAN technologies

*** R15 power enhancements features (Early data transmission, Wake up Signal, SR, Reduced system acquisition time, RRC connection release...)

- **NB-IoT R14 + further power consumption enhancements will be well adapted to address Smart Water Meter use case.**

Prioritize and accelerate the work on power consumption

In 2016:

The Smart Water Meter market started to take off significantly.

In 2017:

Many Calls for tenders for long term contracts (15 years) are triggered worldwide

- Non 3GPP technologies are currently deployed to satisfy those.
- Likely to increase significantly in the upcoming months.

In 2020:

The Smart Water Meter market is predicted to reach more than 1 Billion devices worldwide.

In order for the business opportunity for NB-IoT to be maximized, additional enhancements for power savings are needed to be standardized.



We believe that it is in the interests of 3GPP to accelerate the work on R15 power consumption for NB-IoT and agree on completion of this work before the end of the year.

- This needs to be done now to allow operators and manufacturers to plan an early implementation of these features.

Accelerate the work on power consumption

Proposal 1 - To prioritize R15 power consumption enhancements to be completed by Dec 17 for early implementations:

- Early data transmission
 - Reduced system acquisition time
 - Wake–Up signal
 - Support for physical layer SR
 - RLC UM
 - RRC connection release enhancement
 - Device capacities enhancements to distinct deep indoor meters from mobility devices
- **Timeline:** Sept 17 – Conceptual Design Completed / Dec 17: Work Frozen /CR agreed

Proposal 2 - Add NB-IoT RAN 1 / RAN 2 Ad Hoc Meetings in 2017:

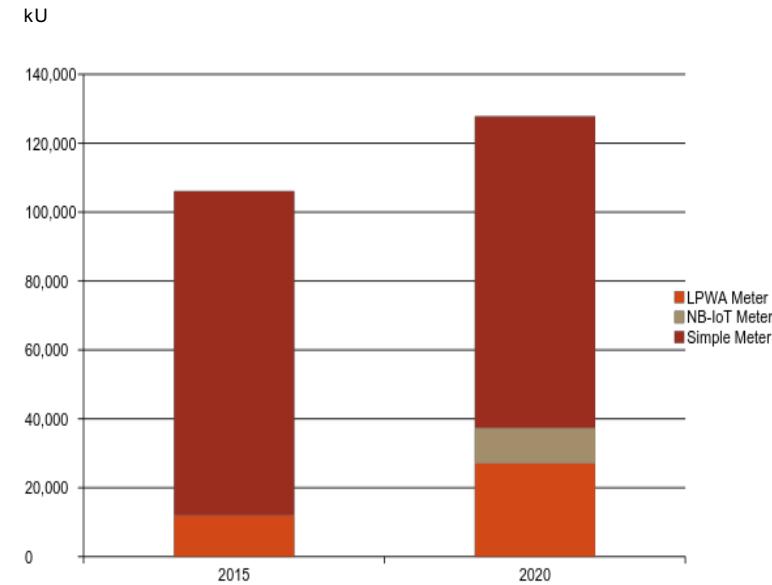
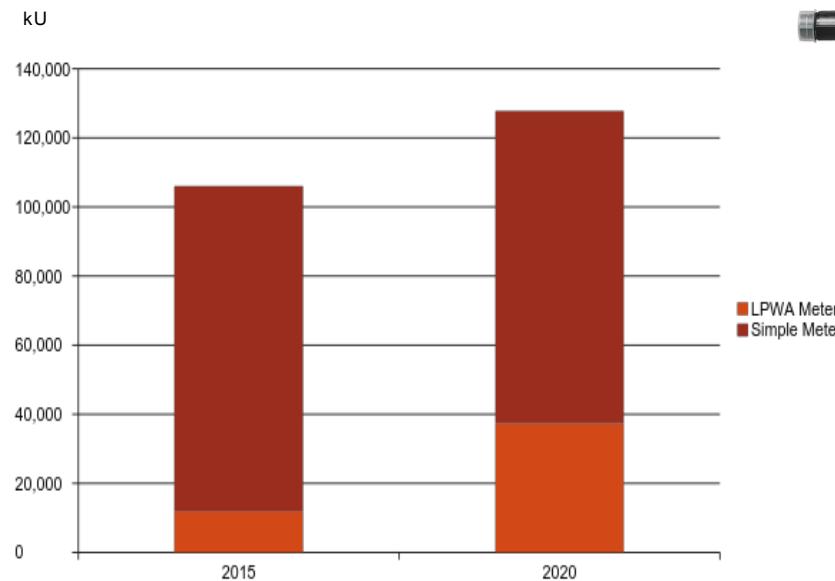
- First one in July (10th-13th – 4 days) sponsored by Veolia & hosted by ETSI in Sophia-Antipolis (Decision needed)
- Agenda in accordance with priorities defined
- Meeting RAN1/RAN2 (2 days each)
- Decision mandate (to be decided): drafting session to prepare next meeting

Proposal 3 - Increase Time Units per meeting RAN1/RAN2:

- Would be ideal also to cope with extension of the scope
- But TU allocations seems quite full and this may take time to be agreed

Back up - Smart Water Meter Market perspective

- Smart Meter share evolution in water metering market forecast



➤ If power consumption is prioritize and NB-IoT work accelerated, NB-IoT starting to be the most relevant technology for Smart Water Meter by 2020



THANK YOU