

Vodafone and NB-IoT

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Our vision

**“To connect every
machine to transform
lives and businesses”**



Vodafone connects your world

>20m
devices managed

24/7
365 days
support provided

383m
data connections
established each
month

>99%
of incidents resolved
within SLA each month

24
OpCos covered by
central support
function

750k
new connections
activated each month

>400
Large multinationals
centrally billed each
month



Vodafone M2M



Best in Class Network Coverage through owned and partner networks



Gartner.

**Machina
Research**

Analysts recognise Vodafone as the clear leader in M2M



Today's M2M technologies only partially address some key verticals



Gas metering



Large homogenous market measured in millions
Battery life is critical
Large number of potential meter manufacturers



Water metering



Large homogenous market measured in millions
Battery life and propagation is critical
Large number of potential meter manufacturers



Liquid and pressurised fuels

Large homogenous market measured in thousands
Asset is currently un monitored
LPWA can reduce high losses and high churn



Smart Bins



Growing market with good business case
Battery life and network coverage is critical
Complements our hi end connected bins



Environmental Monitoring



Latent market waiting for a low power solution
Battery life and network coverage is critical
Fragmented channel to market in low volumes



Smoke and fire alarms



Massive market measured in hundreds of millions
Battery life and ability to test device is critical
High volume B2C play



Parking monitoring



Market measured in hundreds of thousands
Battery life and low install cost are critical
Low data throughput



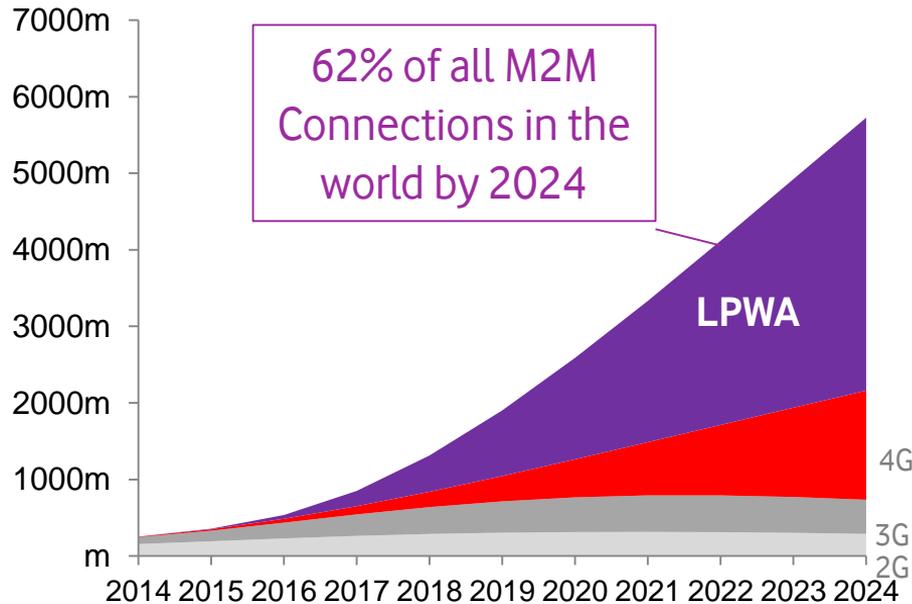
Alarms and event detectors



Market measured in hundreds of thousands
Battery life is ultra critical
Very low data throughput on check and trigger

Source: M2M Business Development

Narrow Band IoT (NB-IoT) has emerged as the licensed spectrum solution for LPWA



Machina Research Forecast – Jan 16

NB-IoT Capabilities

Scalability
(Up to 100k per cell)

Extended Range
(+20dB link budget over GSM)

Battery Life
(>10years)

Device Cost
(<\$5 per module)



Proof of Concept with Aguas de Valencia



- Technology trial in partnership with Huawei (network and chipset) and u-blox (module and dev. board)
- Live NB-IoT network deployment in Vodafone Spain using re-farmed G900 spectrum
- Solution includes upgrade of Huawei SRAN access nodes and virtualized core deployment
- Real water meter locations provided by Aguas de Valencia

<http://www.vodafone.com/content/index/what/technology-blog/nbiot-message.html>

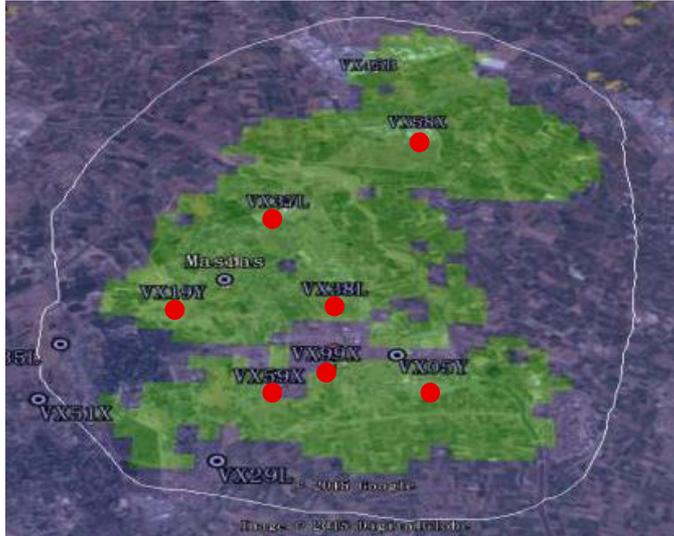
First pre-standard NB-IoT message sent over a live commercial network in Spain

11 Dec 2015

@VodafoneGroup

Visit the Vodafone stand or the GSMA Innovation City stand

Vodafone Proof of Concept, Valencia Spain

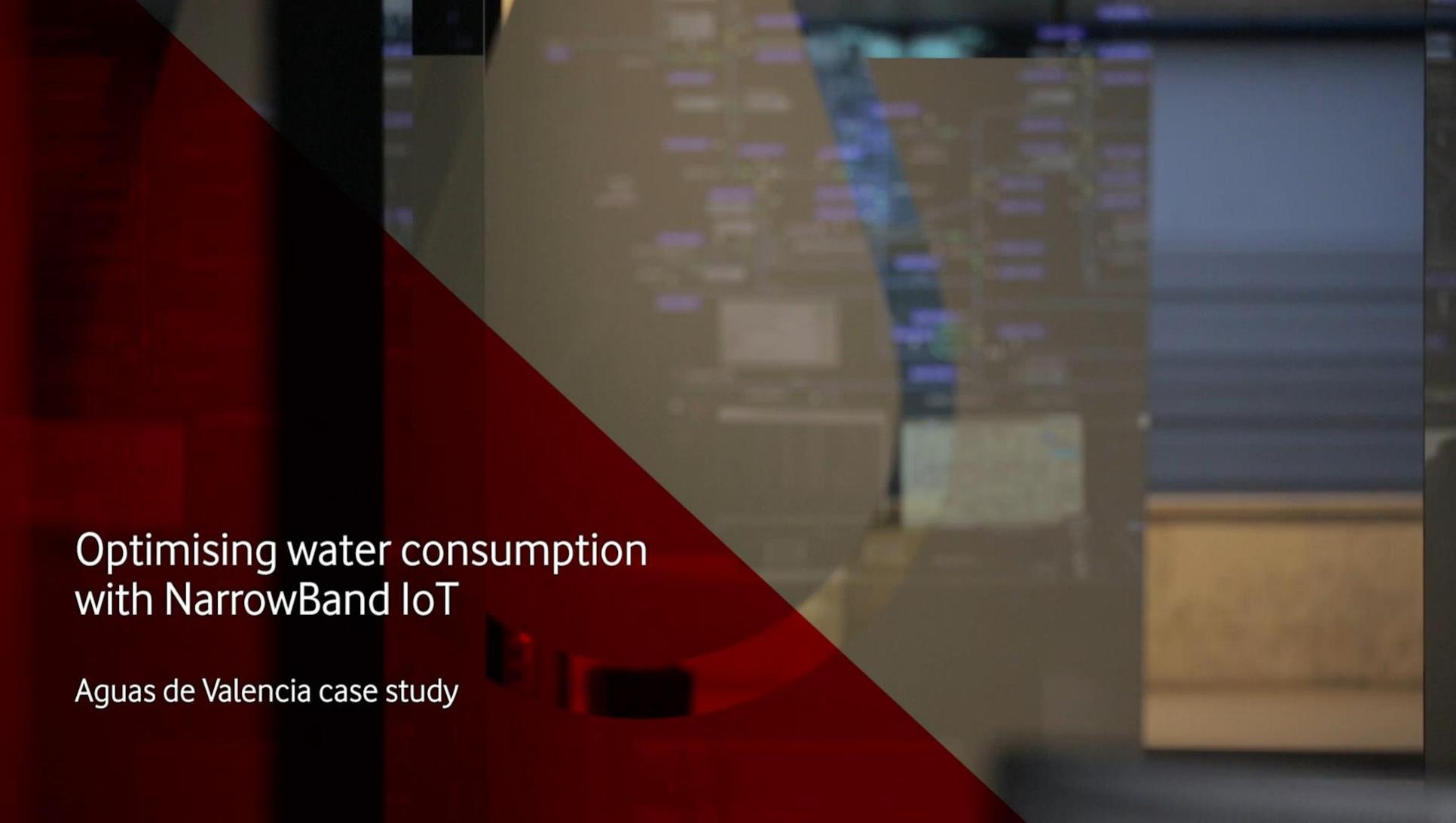


Proof of Concept/Pilot Coverage
GSM +20dB Coverage



Coverage Enhancement	2G/3G Impact	E2E
Verified +20dB (vs GSM) ✓	No service degradation observed ✓	Service layer E2E communication established ✓

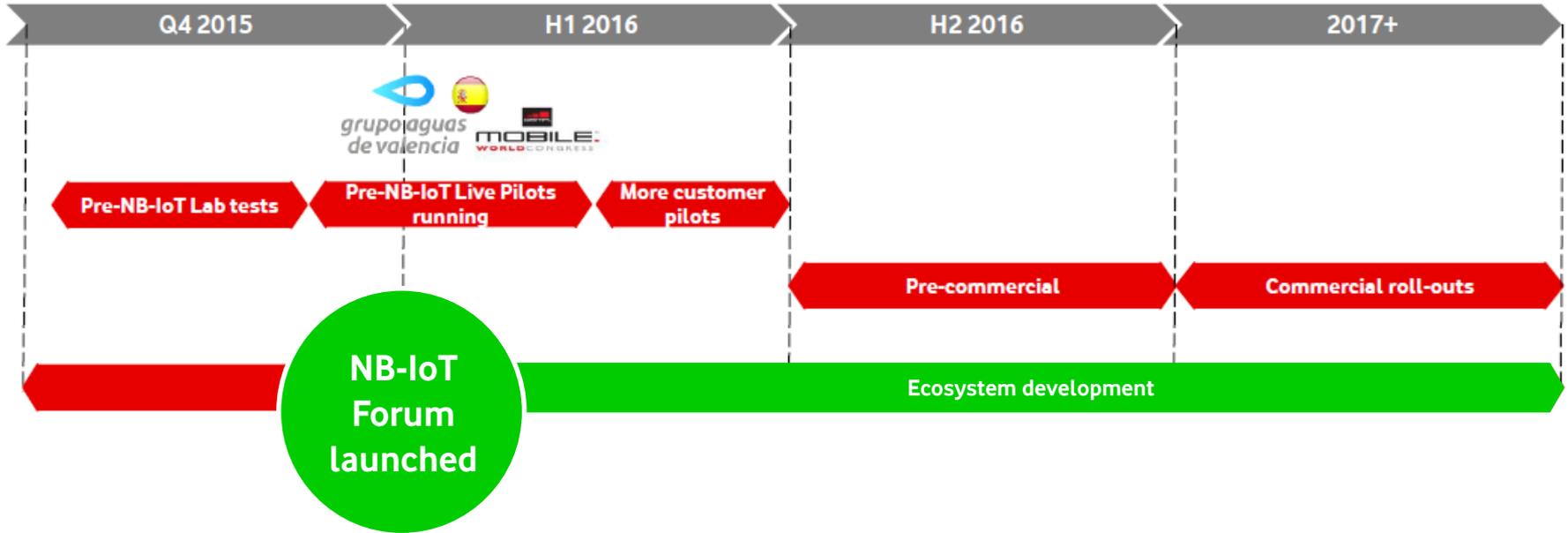




Optimising water consumption with NarrowBand IoT

Agua de Valencia case study

NB-IoT Pilot and Commercial Rollout Timeline



Building the ecosystem for NB-IoT

