DISCOVER THE WIZE ALLIANCE

Wifi :
EVENTANK
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WizeAlliance

Wize Alliance, 1 year on : where are we going ?

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WizeAlliance

Edouard Sauvage
President of the **Wize Alliance**
CEO at **GRDF**

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Eric Rieul
Treasurer of the **Wize Alliance**
and CEO of **Sagemcom Energy & Telecom**

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Guillaume Richard
Connected Utilities Manager
at **Accenture**

Wize in the IoT communication technology ecosystem : performance, references, TCO

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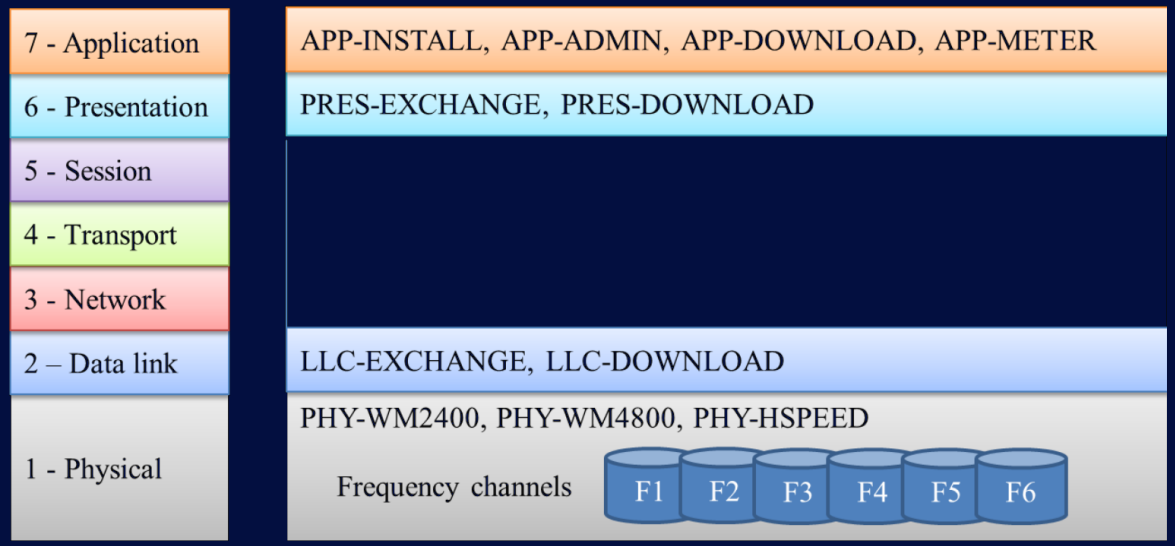
Wize Identity Card

Name	:	**Wize**
Birthdate	:	**2005**
Nationality	:	**French**
Parent	:	**Wireless M-Bus Mode N – 169 MHz**
Modulation	:	**GFSK**



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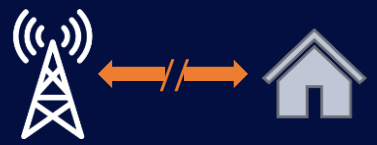
#1 ONE SIZE DOES NOT FIT ALL

#1 ONE SIZE DOES NOT FIT ALL

LAWS OF PHYSICS ARE THE SAME FOR EVERYONE

All other things being equals

Lower frequencies have better penetration



Lower data rates allow better range

Longer communications decrease battery life

Any technology is a compromise between range, data rate, payload, bandwidth occupation and battery life

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#1 ONE SIZE DOES NOT FIT ALL

Form factor
Data volumes
Bidirectionality
Device location
Area size to be covered
Number of end points
Mobility
Geolocation
International roaming
…

NO TECHNOLOGY FITS ALL NEEDS

#2 CHOICE OF CONNECTIVITY HAS A LARGE IMPACT ON TCO

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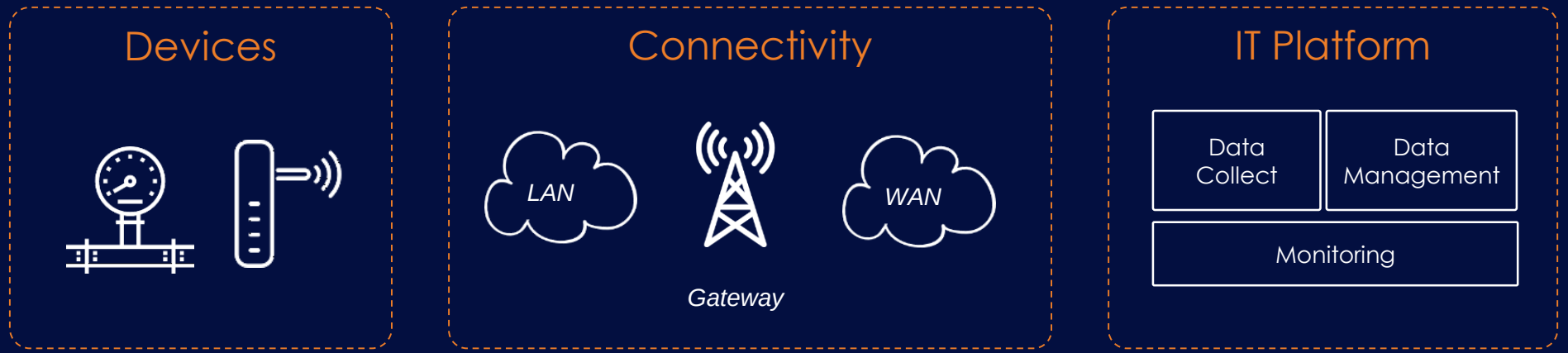

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#2 CHOICE OF CONNECTIVITY HAS A LARGE IMPACT ON TCO

CHOICE OF CONNECTIVITY

Operation model
Infrastructure required
Proprietary vs open technology
End to end service

IMPACTS ALL ASPECTS OF TCO

Obviously…

Costs of devices and network

+

…but also

Time to Market
Fit for Purpose
Deployment
Security
Control
Monitoring
Maintenance
Reversibility
Sustainability
Upgradability

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#3 WIZE IS OPEN

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#3 WIZE IS OPEN

Open
Communication
Technology
EN 13757

License-Free
RF chip
Manufacturing

License-Free
Frequency Band
(169 MHz in
Europe)

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#3 WIZE IS OPEN

License-Free
Frequency Band
(169 MHz in Europe)

Decision 2013/752/EU of 11 December 2013
amending Decision 2006/771/EC on harmonization of
the radio spectrum for use by short-range devices

Band no	Frequency band (1)	Category of short-range devices (2)	Transmit power limit/field strength limit/power density limit (3)	Additional parameters (channelling and/or channel access and occupation rules) (4)
37b	169,4-169,475 MHz	Metering devices (5)	500 mW e.r.p.	Channel spacing: max 50 kHz. Duty cycle limit (6): 10,0 %.

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#4 WIZE IS OPTIMIZED

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#4 WIZE IS OPTIMIZED

169 MHz is compatible with very deep indoor situations

20 years battery life with a standard battery (2,5 A.h) 2x104 bytes data sent per day

Bidirectional protocol with efficient firmware upgrade capabilities

LARGE SCOPE OF USE CASES

PROVEN PREDICTIBLE

FAST FIRMWARE ROLL OUT

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#5 WIZE IS INDUSTRIAL & FIELD PROVEN

#5 WIZE IS INDUSTRIAL & FIELD PROVEN

Wize has been developed following Suez & GRDF
industrial constraints

GRDF

PUBLIC UTILITY
11 MILLION SMART GAS METERS TARGET
MULTI MANUFACTURERS

SUEZ

WORLDWIDE UTILITY
3,5 MILLION SMART WATER METERS
TODAY, INCREASING
2 TECHNOLOGY GENERATIONS

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#5 WIZE IS INDUSTRIAL & FIELD PROVEN

SECURED	INTEROPERABLE	RELIABLE
Simple & robust security mechanism	**Standard** 1-6 layers Install, Exchange, Download messages	**Asynchronous** No dependence from any telecom operator network
State of the art Authentication & encryption methods	Simplified and secure **Operator switch**	**Tested** Aging Performance Redundancy

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#5 WIZE IS INDUSTRIAL & FIELD PROVEN

TODAY

4,5 million devices

500 cities
in **15** countries

13 years
experience

2021

15 million devices

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#6 WIZE IS EVOLVING

#6 WIZE IS EVOLVING

IMPROVMENTS

NEW USE CASES

NEW OPERATING MODEL

And above all

NEW MEMBERS

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#1 ONE SIZE DOES NOT FIT ALL

#2 CHOICE OF CONNECTIVITY HAS A LARGE IMPACT ON TCO

#3 WIZE IS OPEN

#4 WIZE IS OPTIMIZED

#5 WIZE IS INDUSTRIAL & FIELD PROVEN

#6 WIZE IS EVOLVING

THANK YOU

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Eric Frotey
Senior Project Manager at **Itron**, President of **Afnor** E17Z commission

Eric Farnier
Project Manager **SUEZ**
Afnor E17z Head of Delegation

Wize in Wireless M-Bus : how does it work ?

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Toward an unique solution in compliance with European standards

2005

- **WM-Bus protocol release** (433MHz and 868 MHz)
- Allocation of the ERMES range (169MHz) to the « metering and sensors »

2008

1st 169MHz industrial modules

2012

GRDF and SUEZ co-developped a smart metering technology based on the **169MHz**

2013

AFNOR application guide for gas

2017

- **Publication of the LAN protocol** of Wize Aliiance
- AFNOR application guide for **water and gas**
- **Liaison Wize Alliance** – CEN TC294

2018

EN13757/2018 release

Wize in the European metering standardization landscape

European Commission – Mandat 441

CEN – TC 294 : EB 13 757

France	Italy	Germany	The Netherlands	LoRa	Sigfox
AFNOR application guide	169 UNI : CIG				
169 **Wize Alliance**		OMS	DSMR		
LPWAN		LPLAN		LPWAN	

A funnel effect leading to a single industrial IoT solution

CEN TC294
European norm EN13757

- *Freq. range : 433, 868, 169*
- *Com. mode : S, T, C, R, F, N*
- *Security mode : 5, 7, 8, 9, 10, …*
- *Application layer : undefined*

AFNOR NORMALISATION
French application guide of the European Norm EN13757

- *Freq. ranges : 433, 868, 169*
- *Com. modes : T, R, F, N*
- *Security modes : 5, 8*
- *Application layers : water and gas*

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- *Freq. range : 169*
- *Com. mode : N*
- *Security mode : 8*
- *Application layers : Water and Gas*

100% open, interoperable, designed for utilities

End-to-end solution

- ✓ Security embedded
- ✓ Installation and maintenance use case included
- ✓ Existing ecosystem shared among industry leaders
- ✓ **AFNOR gas & water** metering application profile

M-Bus wireless · CEN · AFNOR NORMALISATION · WizeAlliance

Mateu Crespi
International Project manager
Smart Metering at **SUEZ**

Massimo Cesaro
CTO at **SensorNet**

VHF 169MHz in Europe : Use cases from Spain & Portugal, and Italy

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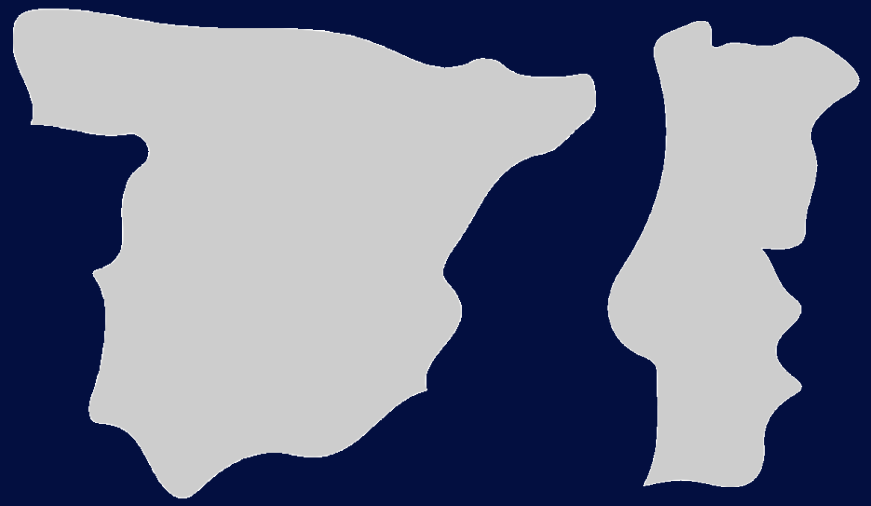
SPAIN + PORTUGAL



Mateu Crespi
International Project manager
Smart Metering at **SUEZ**

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SINCE 10 YEARS, SUEZ IS THE EUROPEAN MARKET LEADER FOR SMART METERING OF WATER METERS

>1M
smart meters

Spain & Portugal

- **Customers:** local authorities, housing professionals, residential or industrial property managers and large consumers
- **In Europe and abroad:** Spain, Italy, Portugal, UK, Czech Republic, China, Singapore, Chile, Indonesia, Colombia

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suez

MAIN PROJECTS IN SPAIN AND PORTUGAL

Barcelona
250,000

Alicante
150,000

Murcia
40,000

Córdoba
25,000

Coimbra
21,000

DINAPSIS: CENTRALIZED SUPERVISION AND MAINTENANCE OF SMART METERING EQUIPMENT

An essential role towards efficiency in Smart Metering

- Control center for continous supervision of the Smart Metering network
- Monitoring of the communications and IT environment (servers, DB, ...)
- Remote maintenance and Work Order management

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REFERENCES:
COIMBRA

KEY DATA

Scope: 20,840 smart meters

Type of contract: Installation and management

Duration: Since 2016

BENEFITS

CAPEX reduction ○○○

OPEX savings ●●○

Quality RISK mitigation ○○○

OPERATIONAL performance ●○○

SOCIAL ENVIRONMENT impact ●●●

REPUTATION from brand value ●●●

WizeAlliance

suez

REFERENCES:
COIMBRA

- **200,000** inhabitants
- **Águas de Coimbra** has been supplying water for **125 years** to **83.000 customers**

CLIENT EXPECTATIONS

IDENTIFY fraud

IMPROVE transparency with customers

RAISE consumers' awareness of the importance of resource protection

VALUE CREATED FOR THE CLIENT

Control and supervision of meters and invoicing timetables have been improved.

A daily readout of water consumption allows data to be collected and processed automatically by the IT system.

Abnormal consumption and leaks are now detected.

There are no more disturbances due to manual meter reading and bills truly correspond to the volumes of water that have been consumed.

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suez

REFERENCES:
CÓRDOBA

KEY DATA

Scope: Cordoba's provincial area (80,000 users)

Project turnover: €3.6 M (w/o VAT)

Type of contract: Meter renting

Duration: 2 + 2 years (starting in 2015)

BENEFITS

CAPEX reduction ○○○

OPEX savings ●●●

Quality RISK mitigation ○○○

OPERATIONAL performance ●●●

SOCIAL ENVIRONMENT impact ●●○

REPUTATION from brand value ○○○

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REFERENCES: CÓRDOBA

- **EMACSA** is the entity responsible for water management
- **Suez Spain** has been supplying this entity with metering equipment since **2010**

CLIENT EXPECTATIONS

- IDENTIFY possible cases of fraud
- BETTER PERFORMANCE of a scarce resource
- OPTIMISE the data collection

VALUE CREATED FOR THE CLIENT

EMACSA has installed 15,000 meters and plans to deploy 40,000 more during the next 2 years in light of the installation's success.

There are 4,100 meters supervised automatically in different areas within the municipality.

The telephonic equipment of the VHF system (169 MHz) has also been supplied.

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ITALY

Massimo Cesaro
CTO at **SensorNet**

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Regulation Authorities in Italy

- ARERA: Energy, Gas and Water Authority
- AGCOM: Telecommunication Authority
- AGCM: Anti-trust Authority
- GPGP: Privacy and Data Protection Authority

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Technical Bodies in Italy

- CIG: Gas
- CTI: Thermo energy and environment
- UNI: Italian technical standard organization
- CEI: Electricity and Metrology

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Gas Smart Metering in Italy

- Regulated market by ARERA
- Technical standard defined by CIG
- 2013: plan for gas smart meters installation
- 2018: roll out of ~12 Million smart meters

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ARERA/CIG checklist

- Interchangeability
- Privacy and security
- Low CAPEX and OPEX infrastructure costs

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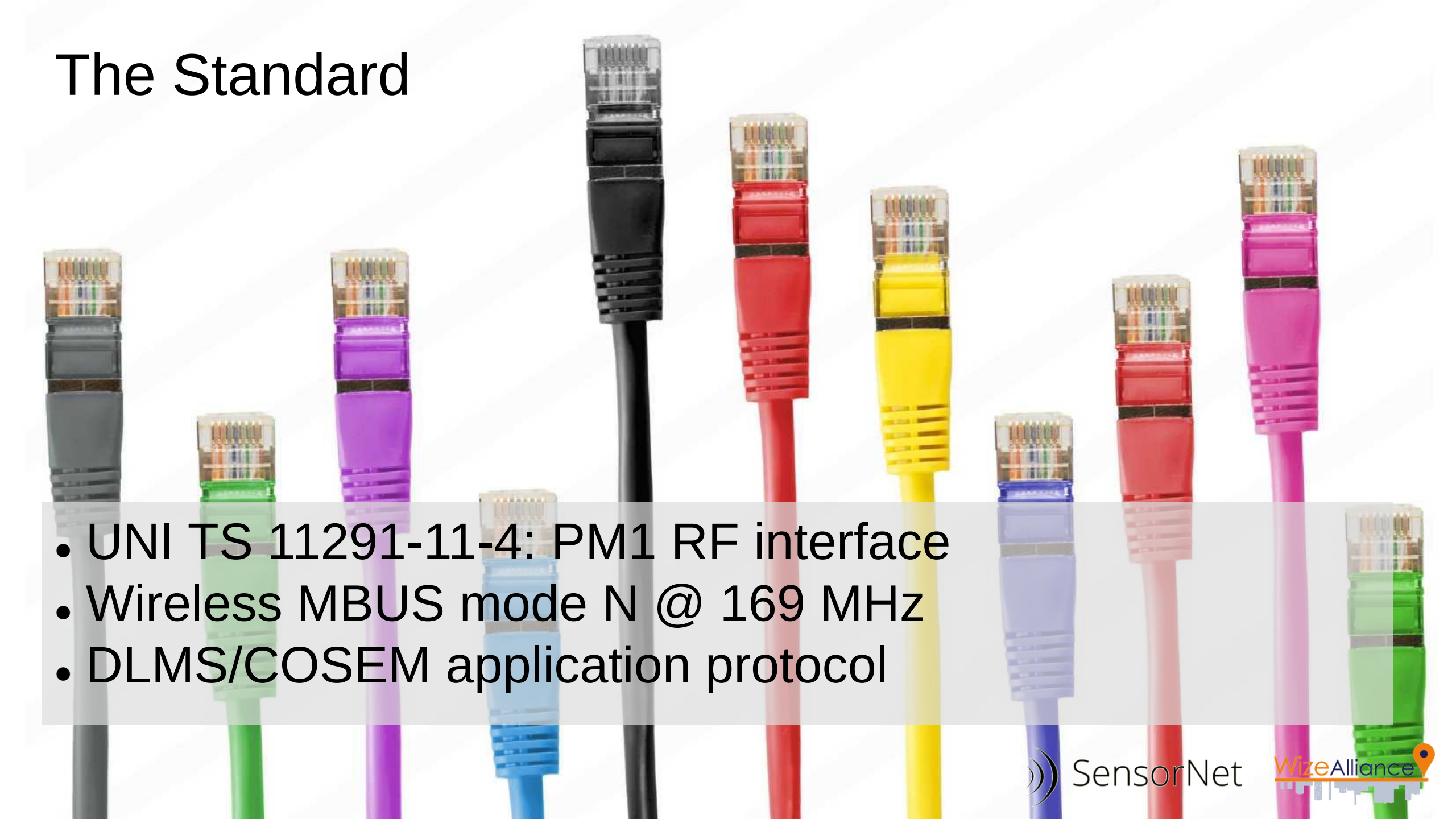
The Standard



- UNI TS 11291-11-4: PM1 RF interface
- Wireless MBUS mode N @ 169 MHz
- DLMS/COSEM application protocol

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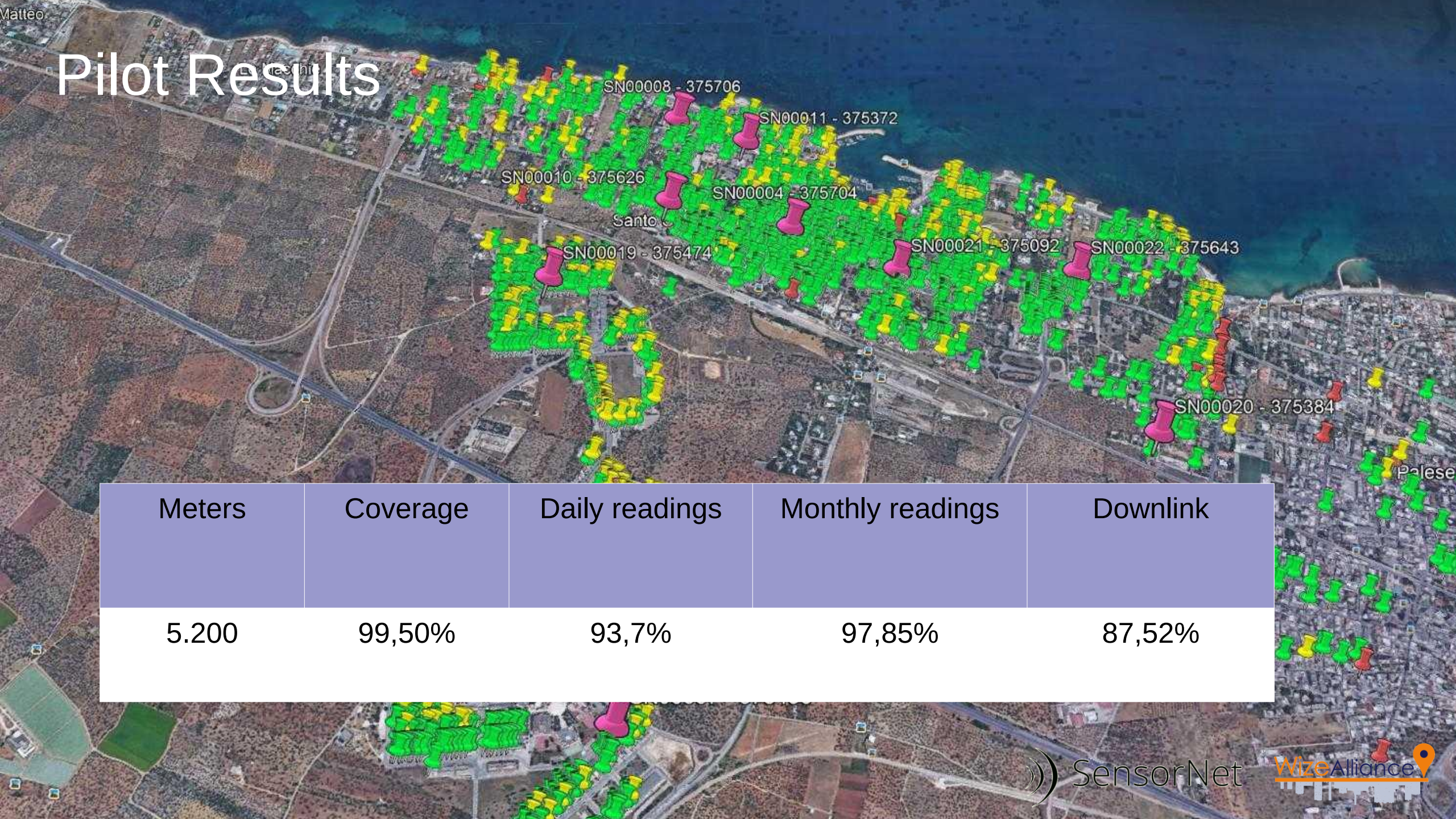
Case study: City of Bari

- ReteGas Bari, municipal DSO
- 121.000 gas meters
- Pilot start in 2015

Pilot Results



Meters	Coverage	Daily readings	Monthly readings	Downlink
5.200	99,50%	93,7%	97,85%	87,52%

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Future development

- Additional services for public utilities
- Water smart metering, street lighting, etc.
- Network capacity increase
- UNI TS 11291 extension for “fair use” of channels

UNI TS and Wize

- UNI TS specifications can interoperate with Wize
- Broader device market and ecosystem

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About SensorNet

- R&D Company, based in Italy
- Focused on AMI, LPWAN and IIOT solutions
- Smart meters & gateway reference designs
- Open source wMBUS and DLMS/COSEM


THANK YOU
SensorNet
WizeAlliance

ROUND TABLE CONFERENCE

Wize « starter kit » for developers :
where are we ?

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Daniel Derrien
Application Manager at **STMicroelectronics**

Marc Fabregas
CEO of **Allwize**

Peder Martin Evjen
Managing Director at **Radiocrafts**

Jerome Cloute-Cazalaa
Sr Staff FAE – IoT/Wireless at Silicon Lab

moderated by **Eric Farnier**, Strategic Projects Manager at SUEZ

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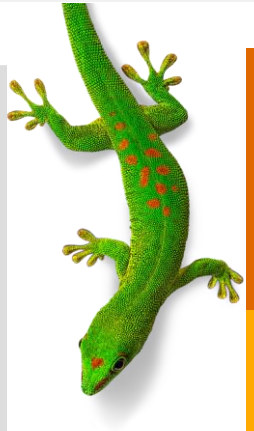
Wireless SoC : Flex Gecko EFR32FG14



CPU and Memory

- ARM Cortex-M4 w/ FPU + MPU
- 256kB Flash + 16kB for bootloader
- Debug Interface
- 32 kB RAM
- LDMA Controller

Clock Management

- High Freq Crystal Osc
- High Freq RC Osc
- Auxiliary RC Osc
- UL & Low Freq RC Osc
- Low Freq Crystal Osc
- PLFRCO

Energy Management

- Voltage Regulator
- Voltage Monitor
- DC-DC Converter
- Brown-out Detector
- Power-on Reset

Security

- 1x Crypto AES, ECC, SHA
- CRC32
- TRNG

32-bit bus

Peripheral Reflex System

Serial Interfaces

- 2x USART
- Low Energy UART
- 1x I2C

I/O Ports

- External Interrupt
- Up to 31 GPIO (5V Tol)
- Pin Reset
- GPIO Wakeup

Timers and Triggers

- 3x Timer/ Counter
- Low Energy Timer
- LESENSE
- Watchdog
- Pulse Counter
- Protocol Timer
- RTCC
- Cryotimer

Analog Modules

- ADC
- 2x Analog Comparators
- IDAC
- VDAC & OPAMP

Radio

- BT 5 (2M) (int. balun)
- 2.4G and <1G proprietary
- Integrated PA
- Radio Controller
- Packet Trace
- Radio Crypto

Feature available down to Energy Mode

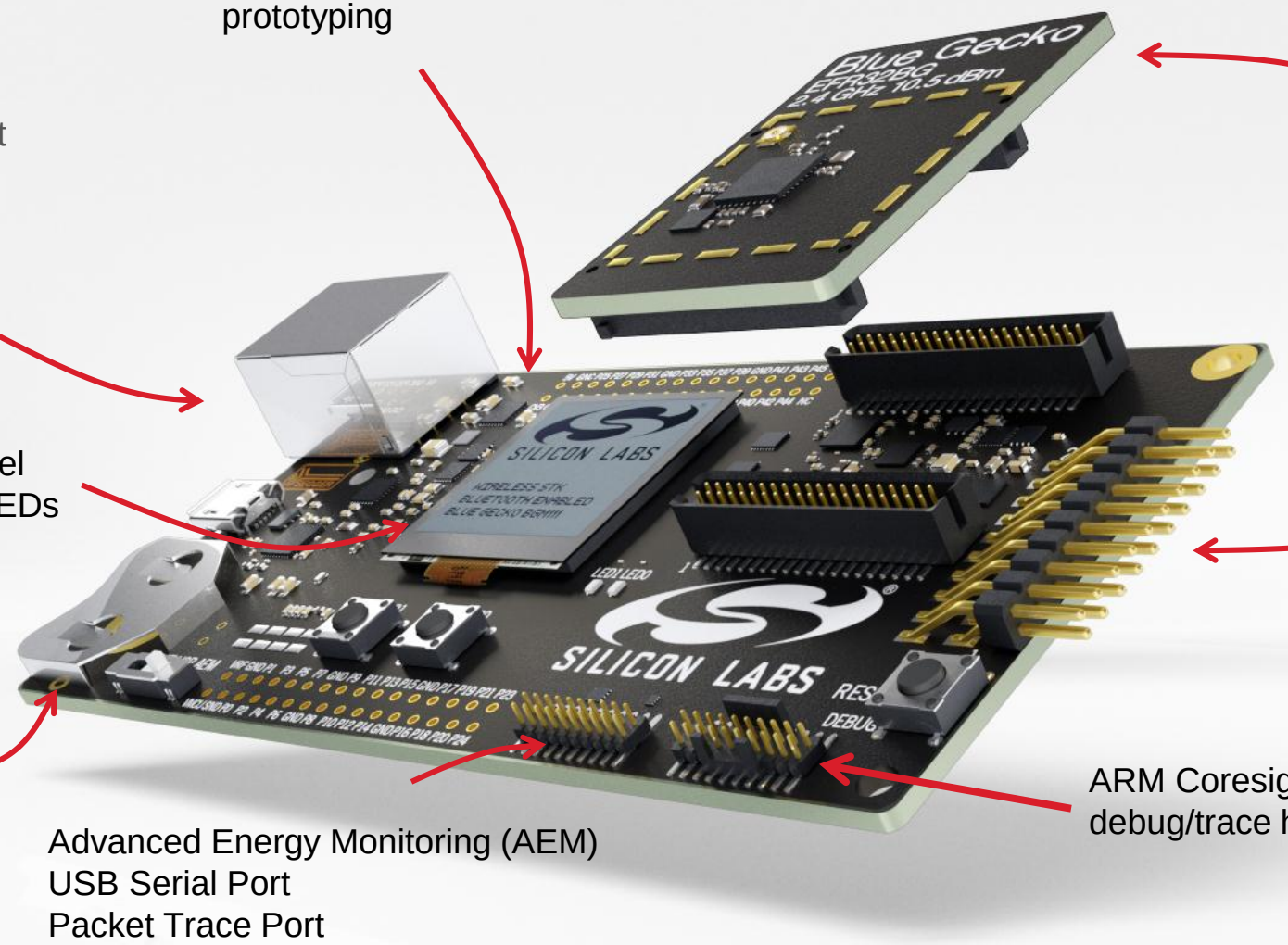
- EM0 Run
- EM1 Sleep
- EM2 Deep Sleep
- EM3 Stop
- EM4H Hibernate
- EM4S Shutoff

WIZE Development Hardware

Radio pin access headers for prototyping

Integrate J-Link debugger
Connect via USB or Ethernet
Virtual Com Port support
Packet Trace
Energy Profiler

Radio card header for easy swapping



Ultra-low power 128x128 pixel memory LCD, buttons and LEDs

Expansion header for prototyping

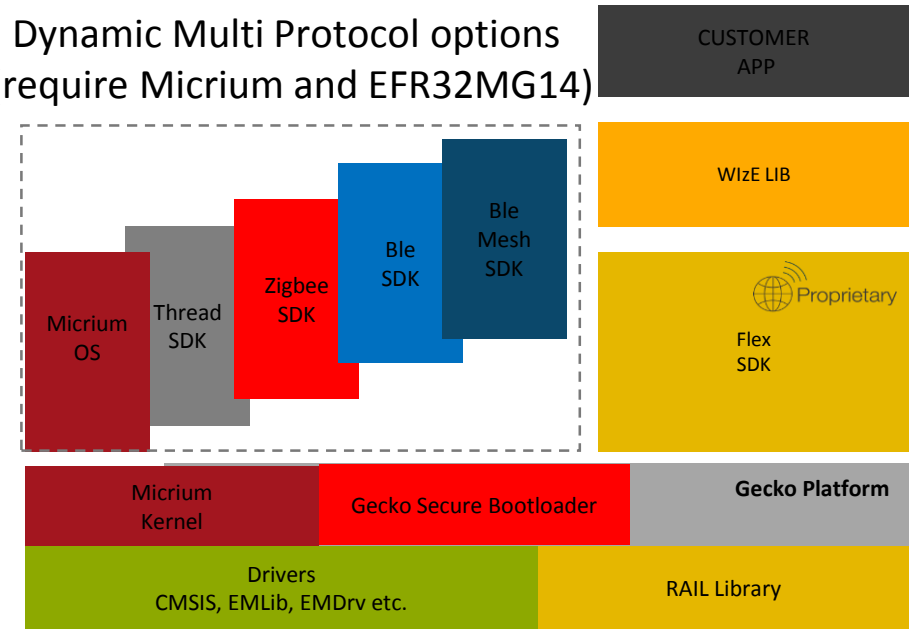
USB Power or Battery Power

Advanced Energy Monitoring (AEM)
USB Serial Port
Packet Trace Port

ARM Coresight 19-pin debug/trace header

Development suite

Dynamic Multi Protocol options
(require Micrium and EFR32MG14)



EFR32xG1/12/13/14 SIP/PCB modules

Development Tools

Includes:
IDE
Network analyzer
Energy profiler

Radiocrafts

- Provider of RF modules
  - Wireless M-Bus
  - KNX
  - Sigfox
  - ZNM - Zigbee
  - RC232
  - Tinymesh
- Custom and application specific design
  - Water meter applications
  - Smoke detector
  - Custom specific radio protocols
  - Sensor interfaces
  - PCB, power management, antenna design

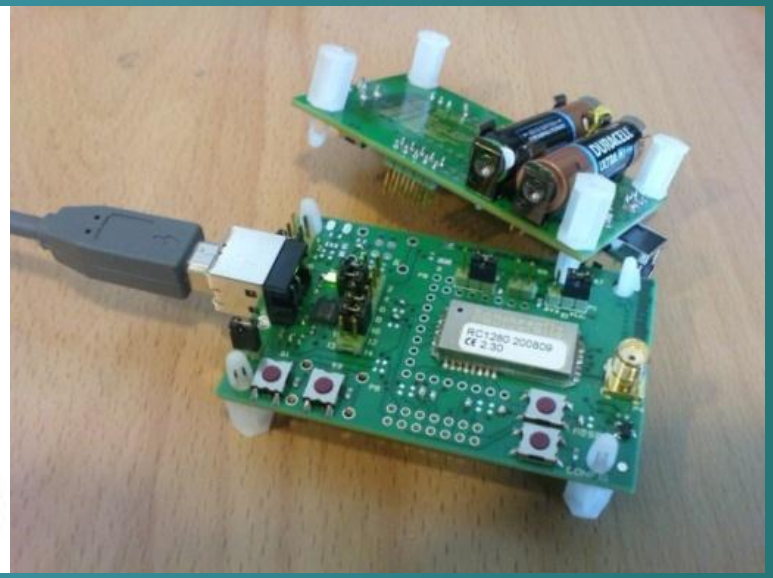
169 MHz Wireless M-bus - Wize

- RC1701HP-MBUS4 modem — Wireless M-Bus
- RC1701HP-MPC1 — Pulse Counter
- RC1701HP-OSP V1 — Ondeo Systems Protocol, V1
- RC1702HP-xxx modules — V1 Application specific
- **RC1701HP-WIZE — Wize modem, V2**

- Application and custom specific modules
  - Water meter profile
  - Other profiles

WIZE Development Kit

- Two Development Boards with the module of choice, onboard USB level shifter and USB connector, SMA antenna connector, I/O break-out
- Quarter-wave stub antennas with SMA connector
- USB cables
- The HP variants include additionally AC/DC Power Supplies



Alain Désandré
Head of Smart Solutions at GRDF

Samuel Loyson
Head of Smart Metering at SUEZ Smart Solutions

Wize networks and operators

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Dedicated IoT networks VS. Generic IoT networks

GENERIC

- Existing (or ongoing) large scale coverage
- Low entry costs

- Unsecured performances
- No additional network in case of lack of coverage
- Network shared with many other users for other uses (collisions)
- Lack of (very) long term commitment

DEDICATED

- Adapted network coverage, dedicated frequency band
- Performance commitments over complete lifecycle
- Best TCO (marginal operating costs and subscription fees, QoS guaranteed end-to-end) for large scale deployments

- Requires critical deployment size

A Wize network : the example of SUEZ

10 years deployment

Urban, semi-urban and rural areas

International deployment

SUEZ provides its connectivity service to any Wize compatible devices

For any type of data

Collection and **transmission** of raw data

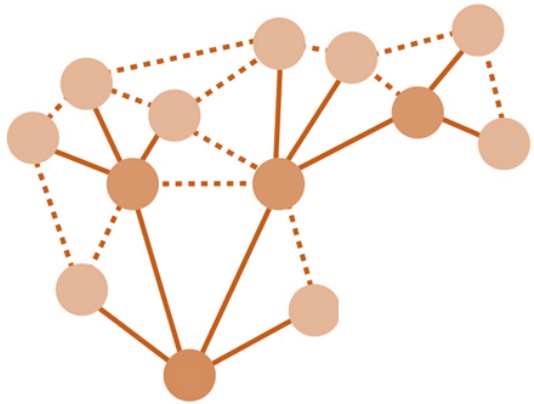
For any water/environment data

Collection, **transmission** and **advanced treatment for value-added services**

What if there is no Wize “SUEZ” network ?

1 **Support for the deployment** and/or operation of a Wize network on behalf of a customer or city

For whom ? any player who must cover a territory of the size of a city or a site. No need to be a Wize member.



2 **Development of a new Wize "Suez owned" network**

For whom ? As part of a more global IoT service operation contract.

GRDF

GAZ RÉSEAU
DISTRIBUTION FRANCE

A SPECIFIC WIZE NETWORK
AT A NATIONAL SCALE

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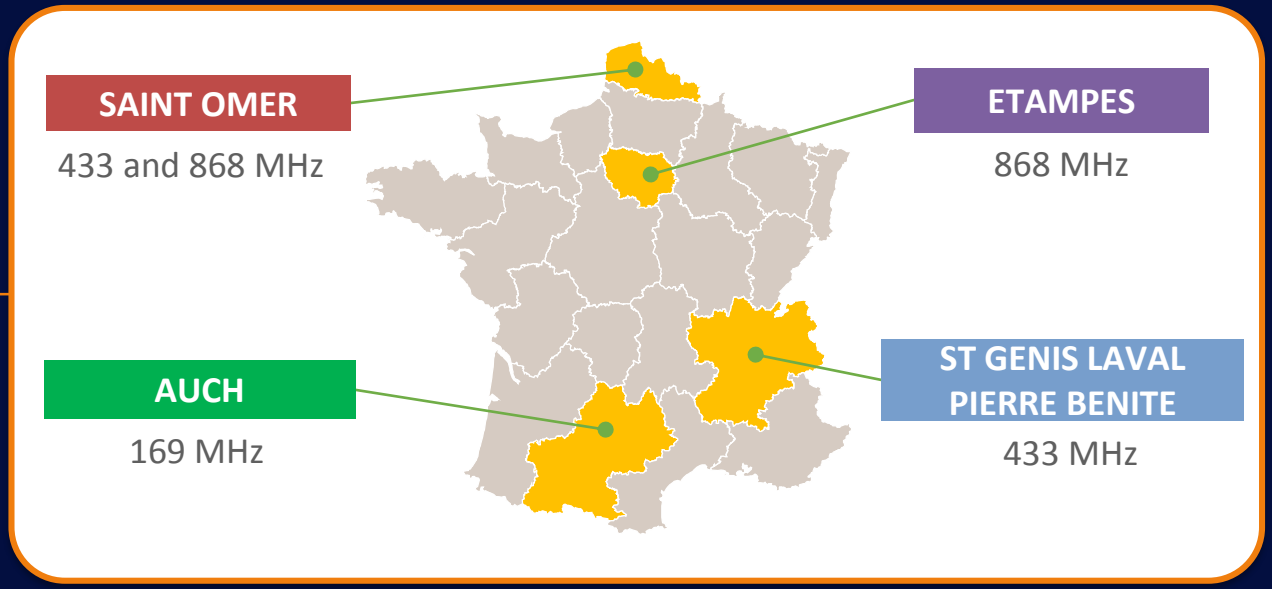
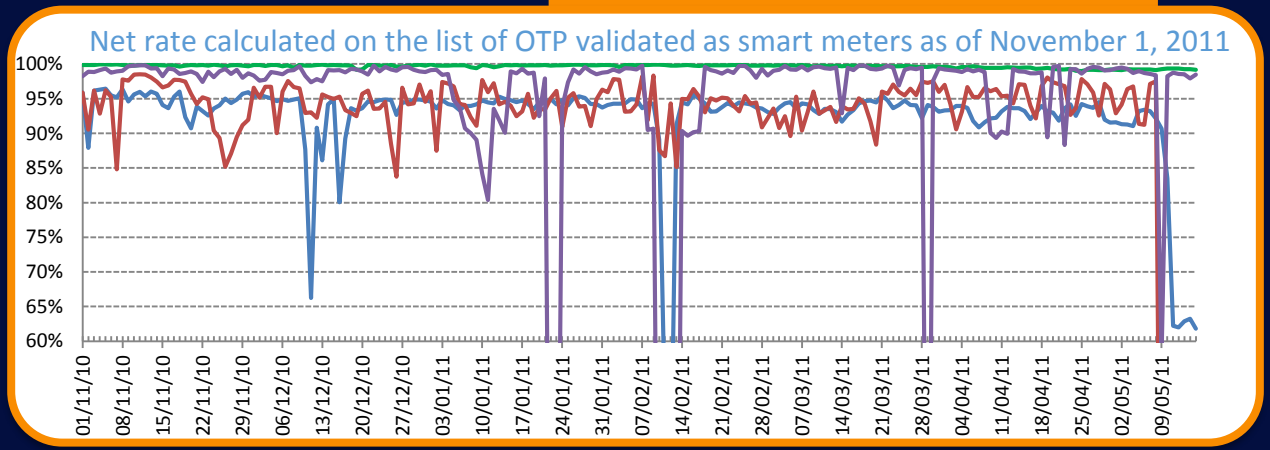
GRDF's IOT Network : a long story … started in 2011 by 4 experiments

Allowed GRDF to determine optimal solution and validate feasibility thereof

Experimentations
on 18,500 meters



Daily net rate of remotely-read meters



169 MHz : the best choice for GRDF

- Best radio stability (10% duty cycle and very few users)
- Minimum gateway to cover 80% of the French gaz users.

GRDF
GAZ RÉSEAU DISTRIBUTION FRANCE

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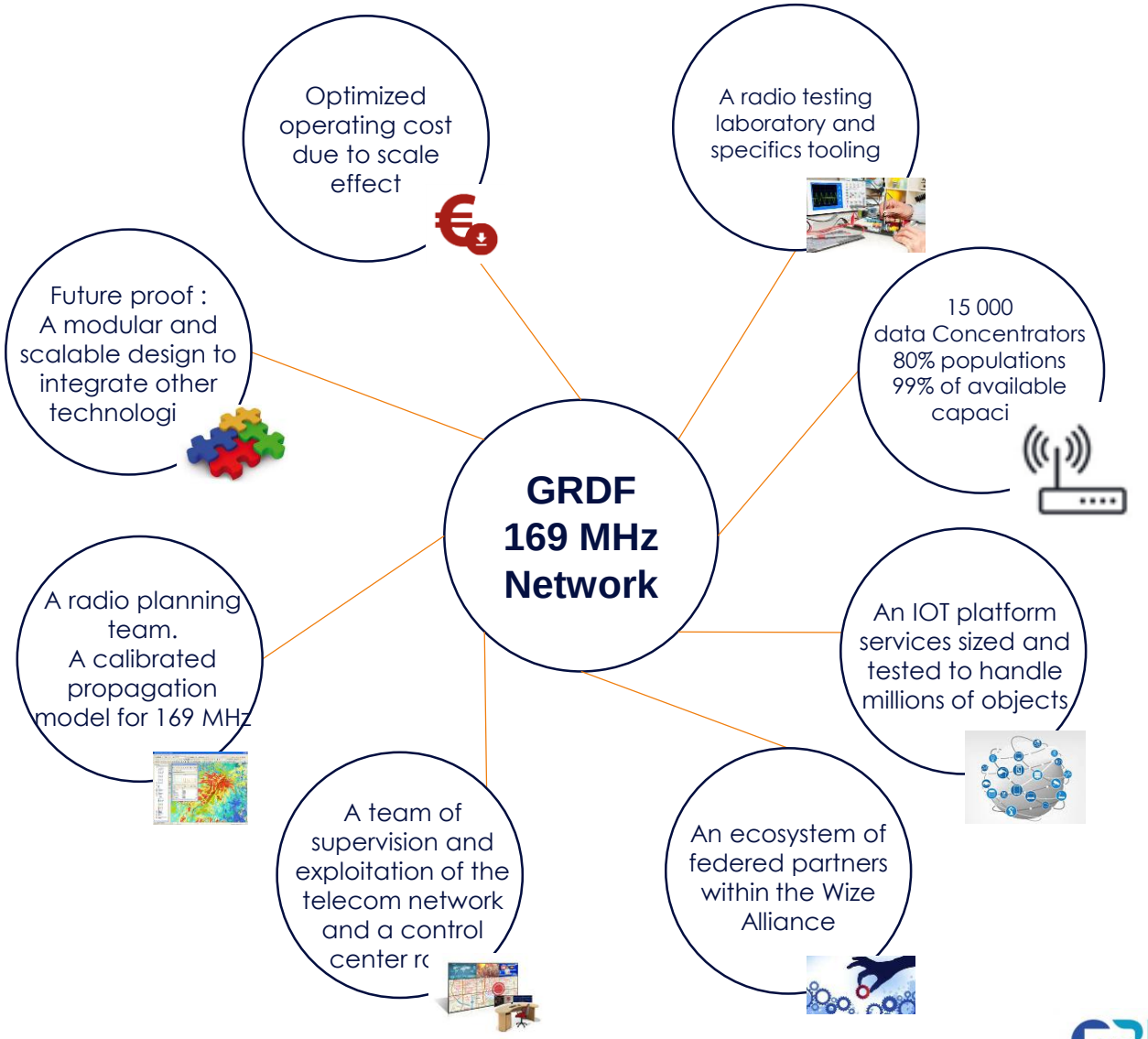
The Gazpar project led GRDF to acquire the skills of an IOT operator

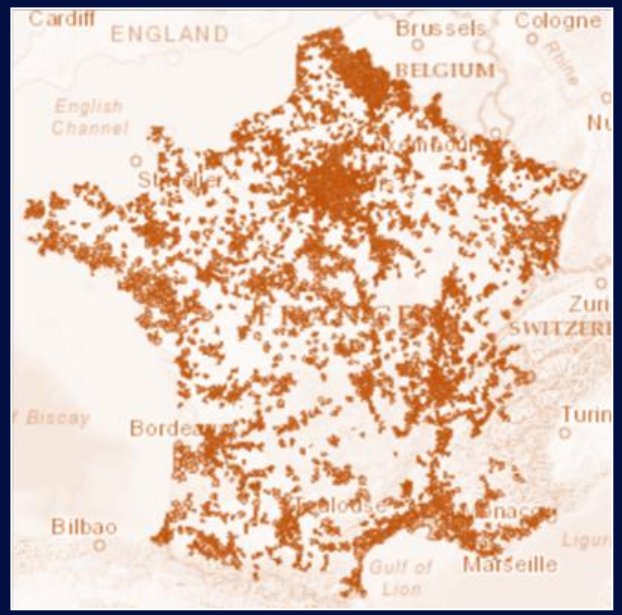


GRDF Wize network coverage in 2021

Durability until 2042 (GRDF will used it for his needs)

Modular and scalable design.

Attractive TCO



Security and confidentiality by design

Full duplex demonstrated on large volumes.

Based on EU standard Protocols

GRDF
GAZ RÉSEAU DISTRIBUTION FRANCE

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These skills were originally built to serve first the many needs of a GRDF's network of gas due to it's digitalization ...

To serve a target of 30% green gas injection into the 2030 grid

But more and more external requests push us to study the provision of our network to other actors.

Two very different kinds of solicitations push us to instruct the setting up of a connectivity service

GRDF Infrastructure

Mutualization Gas-Water and Smart Cities

Customer infrastructure

Requests from other GRDF

Pierre Andrade
Secretary of **Wize Alliance**,
Deputy Chief Executive Officer
of Water France at **SUEZ**

Wrap-up from Wize Alliance's board

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WizeAlliance


THANK YOU !
#BeWize
#discoverWize
WizeAlliance