Smart Meters Roll Out
Summary

Introduction

1. Smart Meters Project based on Energy Efficiency
2. Smart Meters Services
3. Smart Meters Roll Out
4. Technical Solution
# Index reading today in France

<table>
<thead>
<tr>
<th>Tarifs</th>
<th>T1/T2</th>
<th>T3/T4/TP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions of reading</td>
<td>Half yearly (6M)</td>
<td>Daily or Monthly (JJ / MM)</td>
</tr>
<tr>
<td>Number of Clients</td>
<td>~ 11 Millions (99%)</td>
<td>~ 106 000 (1%)</td>
</tr>
<tr>
<td>Delivered quantity</td>
<td>50%</td>
<td>50%</td>
</tr>
</tbody>
</table>

**Annual consumption of reference (MWh)**

| T1: Less than 6          |
| T2: Between 6 and 300    |
| T3: Between 300 and 5000 |
| T4: Higher than 5000     |
## Smart Gas Metering in Europe

<table>
<thead>
<tr>
<th>Member State</th>
<th>% of household using NG</th>
<th>Meters ≤ G6 (≤10m³/h)</th>
<th>Smart Gas Metering rollout period</th>
<th>Penetration rate % by end rollout</th>
<th>Res.ble party for rollout</th>
<th>Remote reading</th>
<th>Remote control of valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>EIRE</td>
<td>37%</td>
<td>650,000</td>
<td>2022</td>
<td>2026</td>
<td>100%</td>
<td>DSO</td>
<td>Y</td>
</tr>
<tr>
<td>FRANCE</td>
<td>38%</td>
<td>11,000,000</td>
<td>2014</td>
<td>2020</td>
<td>100%</td>
<td>DSO</td>
<td>Y</td>
</tr>
<tr>
<td>GB</td>
<td>81%</td>
<td>22,600,000</td>
<td>2012</td>
<td>2020</td>
<td>100%</td>
<td>SUPPLIER</td>
<td>Y</td>
</tr>
<tr>
<td>ITALY</td>
<td>82%</td>
<td>22,900,000</td>
<td>2010</td>
<td>2018</td>
<td>50%</td>
<td>DSO</td>
<td>Y</td>
</tr>
<tr>
<td>LUX</td>
<td>45%</td>
<td>90,000</td>
<td>2018</td>
<td>2020</td>
<td>95%</td>
<td>DSO</td>
<td>Y</td>
</tr>
<tr>
<td>NL</td>
<td>95%</td>
<td>7,600,000</td>
<td>2024</td>
<td>2020</td>
<td>95%</td>
<td>DSO</td>
<td>Y</td>
</tr>
</tbody>
</table>

Summary

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To the benefit of GRDF 11 million customers (households, small-businesses, municipalities)

3 major goals

- Improve customer satisfaction
  - Automatic and daily reading of gas consumption data

- Improve Energy Management
  - More frequent consumption data

- Optimize distribution network
  - Modernization and performance of gas distribution network
Project driven by Energy Efficiency

A conservative assumption to secure expected benefits

3,0%  British calculations
2,8%  Irish B-Case
2,0%  British B-Case
1,5%  French B-Case 2013
1,2%  French B-Case 2011
0,9%  GRDF estimations 2011

Additional savings are expected thanks to the development of new energy management services by energy suppliers, consultants, appliance installers / manufacturers...

Source: Cost Benefit Analysis CRE / Pöyry-Sopra, March 2013
An overall profitable project with a mere 1.5% energy savings assumption

Business case results

- The overall investment cost is about 1 billion euros.
- CAPEX and OPEX costs are financed by the tariff.
- The project is at the end largely profitable for the society (+835 M€) thanks to energy savings expected.
- We believe that globally a mere 1.5% energy savings is highly possible thanks to frequent consumption data. Compared to UK project hypothesis of 2%, GRDF’s 1.5% is quite a prudent hypothesis.

POYRY – SOPRA Business Case Summary from February 2013
Data in M€ 2013 with different updates according to actors
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Services offered to customers

✓ **Access daily natural gas consumption data on Mon Espace GRDF** (personal online space) **with services to help clients save energy**

- Set **consumption thresholds** and receive an alert when it is exceeded
- **Compare the consumption** to other similar households to get a better idea
- Benefit information on **outdoor temperature** to have a better understanding of consumption variations
- Receive **hourly consumption data** (optional service)
- Transmit daily data to **energy service providers** of your choice to benefit new services
  - Customers also have free access to the metering device external plug (i.e. to plug an energy box)

✓ **Monthly consumption data are communicated to energy suppliers, in particular for billing** (twice a year before)

Readings are taken automatically, so there is no longer need for customers to wait for a technician to come
Services offered

**Do’s**

- Proven equipment, reliable and lasting for a 20-year lifetime
- A two-way solution to answer future needs (upgradeability, scalability, interoperability)
- Optimal number of equipment to deploy in field (no repeaters)
- A simple and open solution ensuring economic balance

**Dont’s**

- Systematic Remote Shut-Off Valve
- Systematic Display at Hand
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A simple, robust and reliable technical solution

- **Gas Meter + radio module**
  - Metering (index, flow) and supervision data (battery, anti-fraud)
  - Storage on a couple of days
  - Data Transmission twice a day for less than a second

- **Fixed radio Network**
  - 169MHz bandwidth
  - Temporal redundancy
  - Spatial redundancy
  - Encrypted data

- **Data Concentrator**
  - Index data collection
  - Storage on a couple of days
  - Supervision data (concentrator status)
  - Interoperability with several types of meters

- **GPRS network**
  - Data Transmission several times a day
  - Emission on concentrator initiative
  - Limitation of bandwidth and protection of exchanges

- **National data collection and management system**
  - Data collection and management
  - Supervision and system management
Industry of excellence

A French industry of excellence

Manufacturing and/or assembly

Smart meters
Concentrators

Dinan (Côtes d'Armor)

Vire (Calvados)

Reims (Marne)

Rixheim (Haut-Rhin)
2 options for the metering system

We install a new meter (networked meter): 90%

“integrated meter”

We equip the existing meter with a communication module: 10%

“equipped meter”

Powered by a lithium battery (lifespan: 20y)
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11 billions of smart meters to be deployed in 6 years (budget for 1bn€)

A 150,000 meters pilot spread on one year, then 11 million meters spread on 6 years and an accelerated schedule for concentrators to ensure full coverage of the territory

Roll-out planning
2015 – 2016 : Pilot
2017 – 2020 : Concentrators roll-out
2017 – 2022 : Smart meters roll-out

Evolution
Pilot : 150,000 OTP equipped in 1 about year
Gradual commissioning on 2 years
Industrial cruise regime in 3 years
Controlled decrease during the last year

Update as of December 31st 2017

~700 000 smart meters (only 8 months after the launch of mass roll-out)

~ > 80 000 meters installed / week

~1500 concentrators
Parallel deployments in all regions

and which associates all customers

Goals

11 millions meters and 15,000 concentrators
Externalizing 85 to 90% of the roll-out

Organization

~ 20 local deployments in parallel with a dissemination
• through gradual geographic saturation
• then through « oil stain » principle
Regional steering (x 8)

Roll-out objectives

- Respect roll-out schedule and costs
- Confirm ASAP energy demand savings as expected in the Business Case
- Promote local employment
Positive consequences on employment

1,500 direct jobs created, almost 90% in France

- In-house GRDF Jobs 6%
- Designing and implementing communications chain 13%
- Hardware and material construction abroad 12%
- Hardware and material construction 14%
- Technicians to install smart meters 43%
- Technicians to install concentrators 12%

Development of new services in energy management will also generate numerous indirect jobs
A local dialogue led in the 4 pilot areas

**Local Dialogue stakes**

- Informing the stakeholders and their audience on the different operational aspects of the project
- Co-building the communication tools for the roll-out
- Building awareness on the project’s stakes in energy management

**Various stakeholders**

- Local authorities
- Energy suppliers
- Consumers and renters associations
- Public institutions
- Gas industry
- Public housing landlords
- Professional representatives
Thank you for your attention!

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