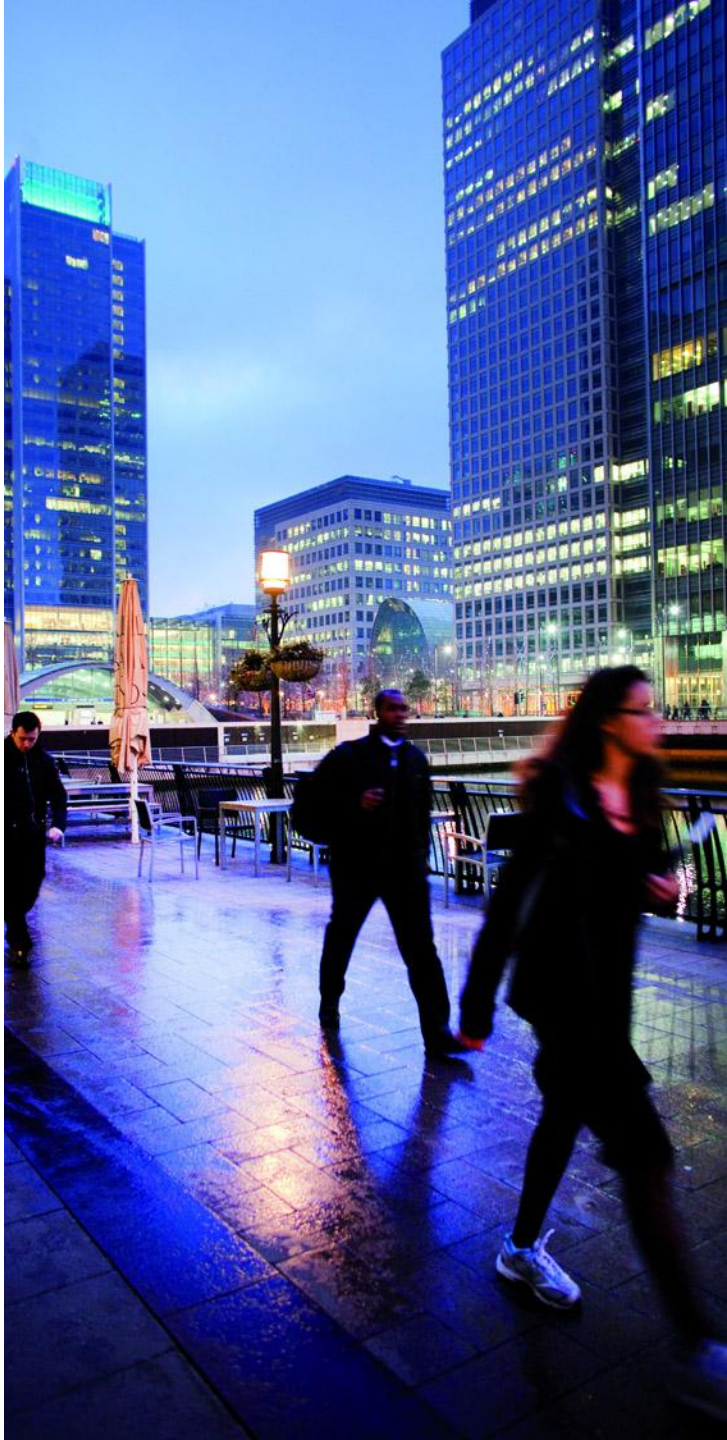
HEP MEETING

SMART METERING EXPERIENCE



EDF International Networks SAS
December 2016

MEETING HEP EDF IN
TENTATIVE AGENDA

1. **HEP issues and ambition on smart-metering**
2. **Why EDF International Networks ?**
3. **Our expertise on Smart technologies**
4. **Focus on Linky experience in France**
5. **Highlight on some EDF IN references**
6. **Exchanges on potential collaboration**

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2 WHY EDF INTERNATIONAL NETWORKS ? 1/3

WHO WE ARE

EDF S.A. — Turnover 75 billion € (2015)

100%

EDF International S.A.S. — Turnover 18,1 billion € (2014)

100%

EDF International Networks SAS

EDF Group know-how & expertise as a leading distribution grid operator, available to international customers such as utilities, investors and newcomers in the distribution grid businesses

- Wholly-owned subsidiary of EDF Group
- EDF Group, a global leader in technical know-how and operations in the field of distribution and transmission grids
- EDF IN has access to experts of distribution and transmission grids,
  - -Enedis, the French DSO and its 38,000 employees. As we sell abroad on a commercial basis the know-how and expertise of Enedis, a regulated company.
  - - but also we have acess if to the expertise of other subsidiaries and entities of EDF Group, including EDF CIST (EDF transmission Engineering Centre), EDF Lab, EDF SEI, … enabling us to provide unique solutions that are customized for the requirements of each project

- Experience in providing consulting services to foreign utilities owners and /or operators of power distribution grids, under various forms :
  - -technical audits, training, technical assistance on a multi-year basis
  - - in various fields such as asset management, O&M activities and network planning, management and/or performance contracts… allowing us to adapt to various situations, and collect useful data for benchmark
- International experience in different geographical zones, including Russia/CIS Countries, China/Asean, Africa, South America, Middle East North Africa, and Western Europe

3 OUR EXPERTISE IN POWERGRIDS 3/3

BASED ON EDF GROUP EXPERTISE AS DSO

EDF International Networks **provides its customers with the « proven-on-the-ground » EDF Group & Enedis expertise and knowledge as an operator and owner** of distribution networks companies

- Our expertise covers all the competencies, know-how and experience of a grid company and network operator in all fields, from basic fundamentals up to the last advanced smart grids and smart meters solutions

- unmatched technical know-how in grid operations and assets

- Besides their strong experience in operations of distribution networks in France, some of our managers and experts are former EDF Group expatriates in companies, such as : London Energy (UK), SSE (Slovakia), Demasz (Hungary), Light (Brazil), Edenor (Brazil), TRK (Russia),…

According to our own domestic and international experience in operating distribution grids companies, in order to be properly managed, each Key Performance Field of a distribution grid company requires the proper combination of several specific competencies, as shown below :

Main Key Performance Drivers of a power distribution grid company

1. Regulation and Tariff
2. CAPEX optimization
3. OPEX optimization
4. Non technical Losses reduction
5. Technical Losses reduction
6. SAIDI / Customer Minutes Lost
7. Renewables integration
8. Smartgrids & smart meters
9. HR & Safety

Key competencies and know-how of a distribution network operator held by EDF International Networks

ASSET MANAGEMENT / NETWORK DESIGN & PLANNING	ENGINEERING AND CONSTRUCTION	DISPATCHING SCADA DESIGN – DMS - OMS
O&M	CUSTOMER MANAGEMENT	METERING
PURCHASING & PROCUREMENT / LOGISTICS	MANAGEMENT / PERFORMANCE	REGULATION & TARIFFS
TRAINING	AUDITS	LIFE-LINE WORKS

2 WHY EDF INTERNATIONAL NETWORKS ? 2/3

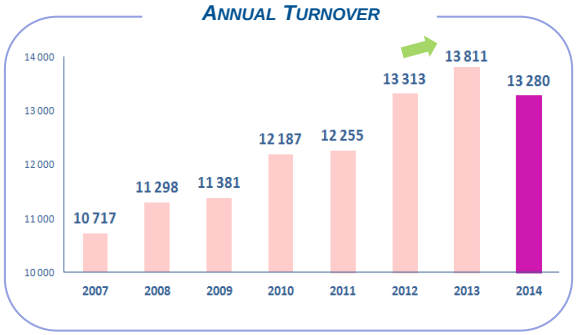
ENEDIS, THE FRENCH DSO

EDF S.A. — Turnover 75 billion € (2015)

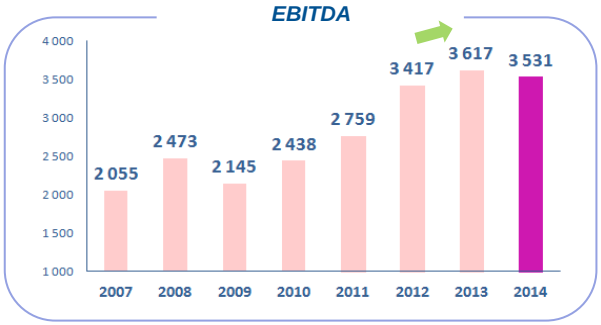
100%

Enedis — Turnover 13.6 billion € (2015)

Enedis Main Financial Indicators show an EBITDA increase trend of +4.5% / year while turnover average increase stands at + 3.2% / year.
With no debt, CAPEX growth stands at an +9.3% / year average.

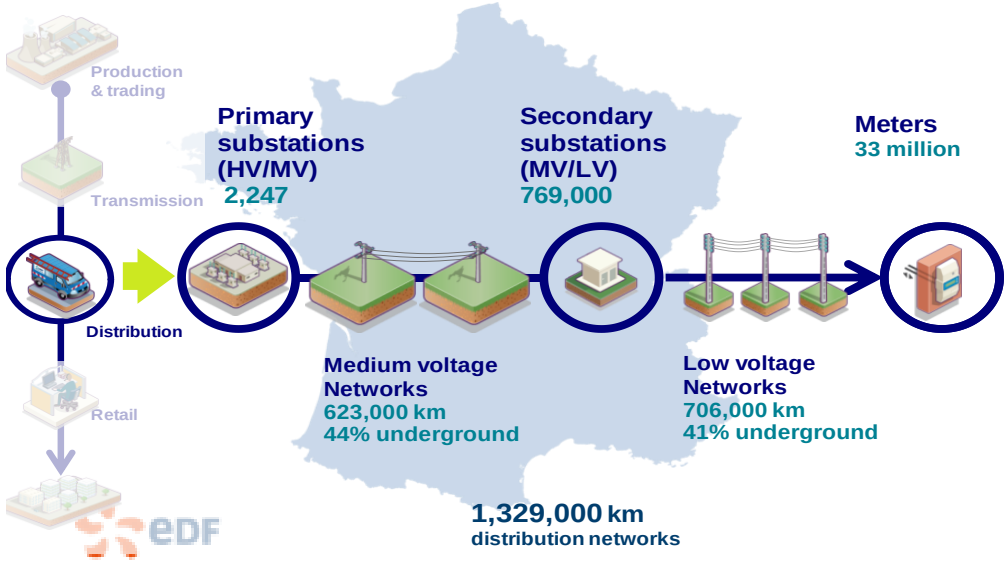


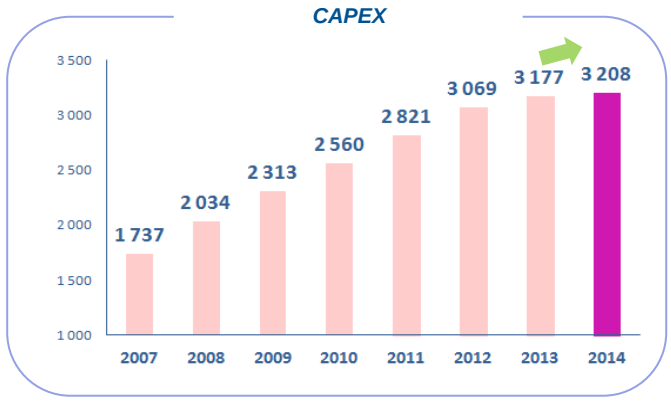
+ 3.2%/YEAR
-3.8% IN 2014



+4.5% / YEAR
-2.4% IN 2014

ERDF OPERATES THE FIRST ELECTRICITY DISTRIBUTION NETWORKS IN EUROPE





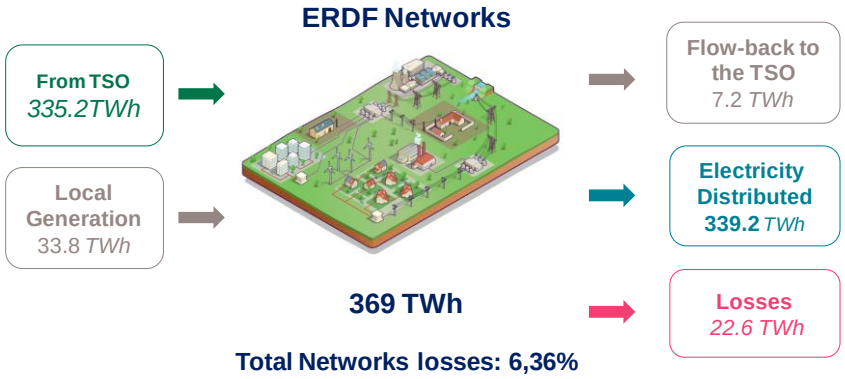
+9.3% / YEAR
+1% IN 2014

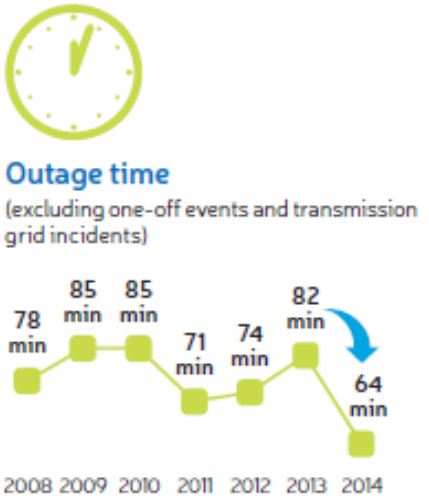
WHY EDF INTERNATIONAL NETWORKS ? 3/3

ENEDIS, THE FRENCH DSO

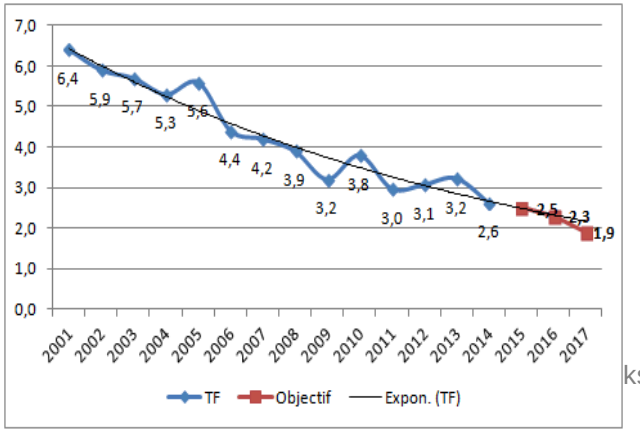
Enedis has also achieved high technical performance indicators through constant optimization throughout the years, in all fields of operations in distribution grids : power losses, SAIDI, HR Safety,…

THE 2014 ENERGY BALANCE ERDF REACHES A RECORD LOW LEVEL IN NTEWORKS TECHNICAL AND NON-TECHNICAL LOSSES





Enedis has achieved a Safety rate of 2.6 accidents per 1 million hours worked in 2014, through long term constant efforts and managerial priority



MEETING HEP EDF IN
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3 A DYNAMIC TO DEVELOP SMART TECHNOLOGIES IS ON-GOING FOR SEVERAL YEARS IN EUROPE

The Joint Research Center has identified **459 smart grid projets** from all 28 European Union Countries in its 2014 report

The total investment amounts to € 3,15 billion during the 2002-2014 period, of which € 507 million in France

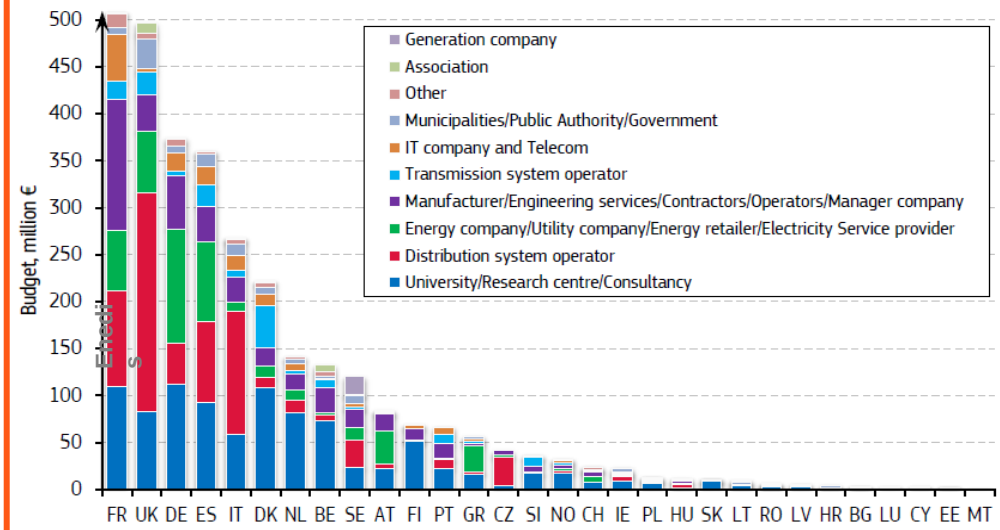


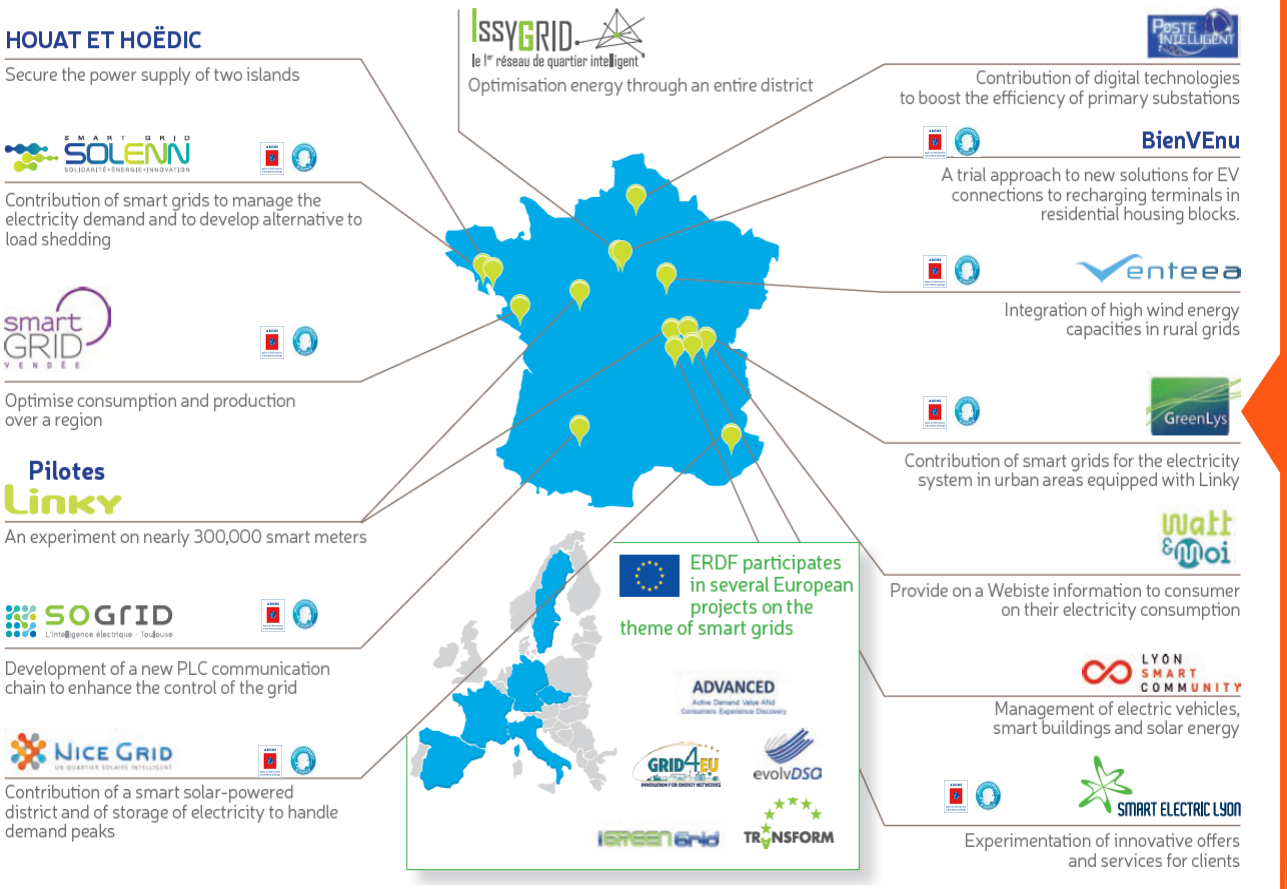
Figure 4.16 Distribution of total budget per organisation type and country[28]

Key facts

- A total of 1 670 organizations involved in the different projects
- The two most active organization types are the **universities (950 M€) and the DSO (710 M€)** and they represent more than one half of total investments in the period 2002-2014
- **France has the largest investment (**507,85 M€) **in the period 2002-2014** followed by United Kingdom (497M€), Germany (363M€), Spain (360M€) and Italy (268,09 M€)

***** Source : « Smart Grids Projects Outlook 2014 »
•http://ses.jrc.ec.europa.eu/smart-grids-observatory

3 ENEDIS IS INNOVATING WITH A PROGRAM OF 18 SMART GRIDS PROJECTS IN IN EUROPE



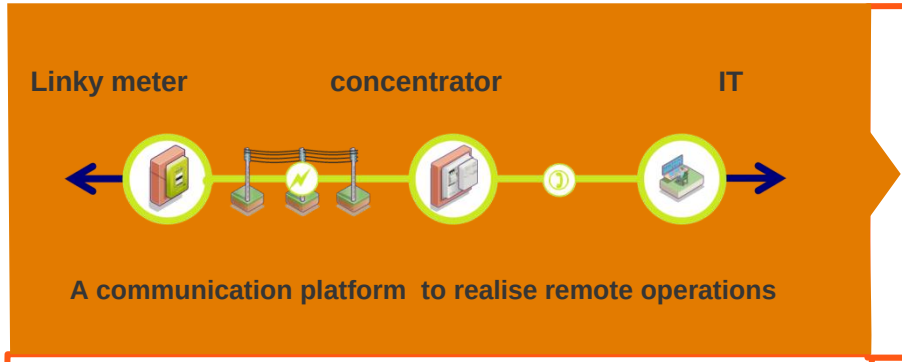
Two main objectives

- Develop robust and industrial technologies in time to face future challenges
- Identify viable business models for all actors of the electric system (covering investments and sharing benefits)

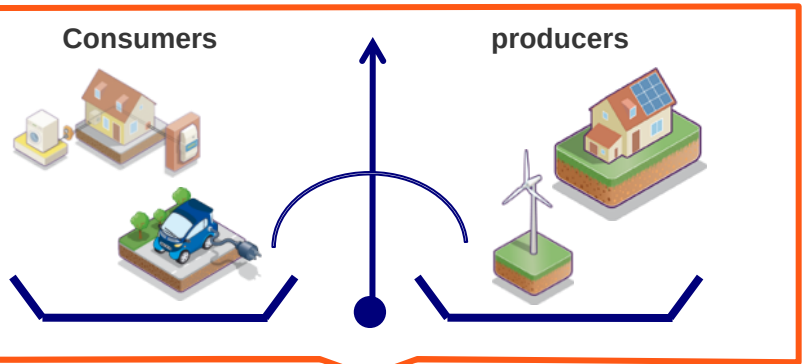
9 demonstrators are supported by ADEME / CGI

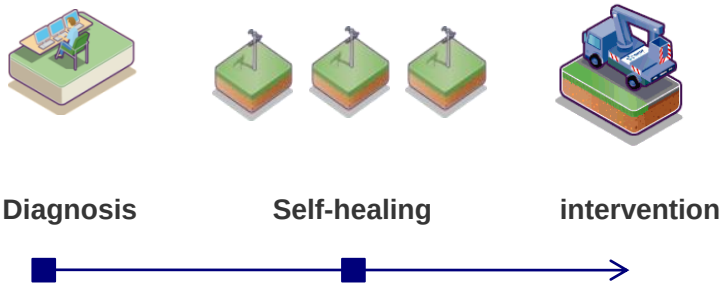
3. LINKY, A KEY COMPONENT OF SMART GRIDS: MASS ROLL-OUT WILL EXTEND UNTIL 2021

Act remotely
via the meter



Contribute to the balancing
Between production / consumption





- Secure access to information to monitor and understand consumption
- Integration of new usage (EV, RES)
- Capacity to manage domestic appliances (up to 8 signals)
- Contribute to peak load management

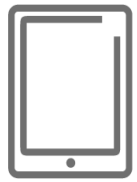
Faster interventions
On the network

Contribute to the energy transition
Information and management

3. LINKY, A KEY COMPONENT OF SMART GRIDS NATIONAL SMART METER MILESTONES

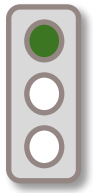
2007

In July 2007, **the electricity market is opened for household customers**. CRE also **defines guidelines and performance objectives for the future smart meter system**, in order to smooth the retail market and minimize DSO costs



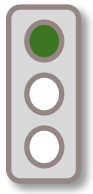
2011

CRE states that the **Linky pilot results are compliant with the 2007 guidelines**, enabling future massive roll out



2012

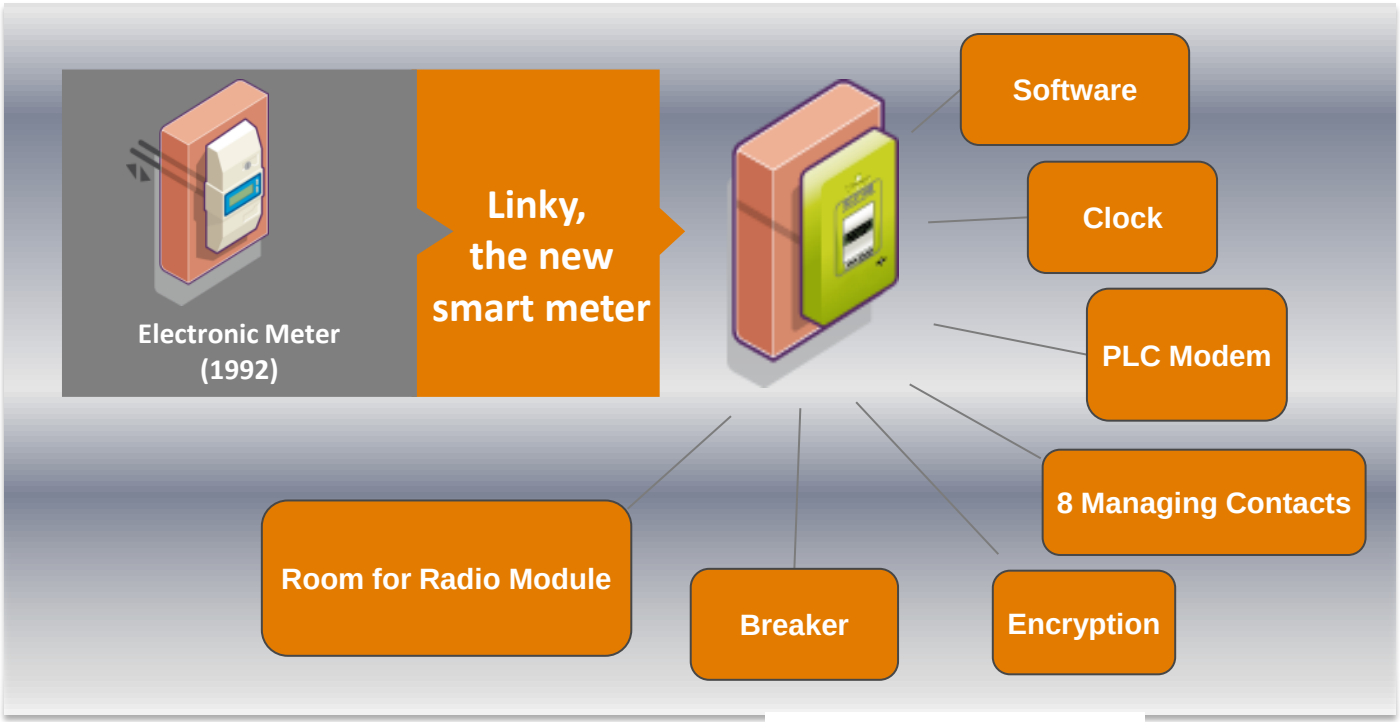
In January 2012, a **legislative decree** following the 2011 CRE deliberations **rules the smart meter functions**, balancing regulatory, legislative and costs issues

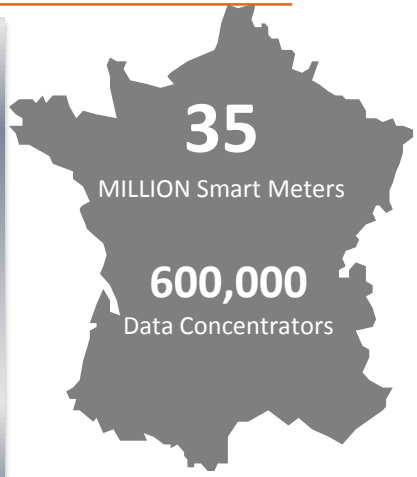


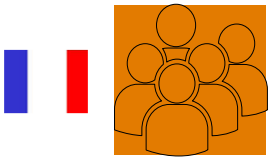
2014

The deliberation of July 2014 sets the start date of the Linky meter deployment for **December 1st, 2015** and the regulatory mechanism to **recover the investment. Target rate of 90% by December 31, 2021**

3. LINKY, A KEY COMPONENT OF SMART GRIDS KEY FIGURES







10 ,000 jobs created in France

(direct or indirect)
(5,000 jobs for mass rollout)

€ 5 Bn

Billion of current Euros of investment by 2021

AN INDUSTRIAL ROLLOUT

6 YEARS

2015→ 2021

TECHNICAL ASPECTS

PLC
FROM THE SMART METERS TO THE DATA CONCENTRATOR

GPRS
FROM THE DATA CONCENTRAROR TO THE CENTRAL I.T SYSTEM

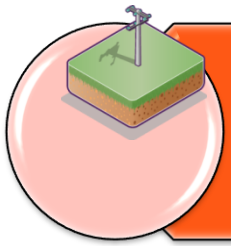
3.1 IN ADDITION TO LINKY, ADVANCED SMART GRIDS TECHNOLOGIES ARE NECESSARY

Smart Grids : a combination of power network technologies with ICT technologies

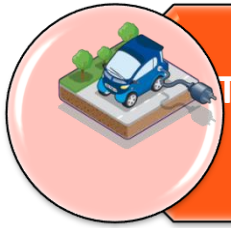
- **Sensors and Smart meters** to get detailed information on the state of the network as well as consumption / generation profiles
- **Devices to exchange information** with generation sites
- **Forecasting tools** to predict consumption and generation **at local level**, combined with **simulation tools** to anticipate potential constraints on the network
- **Digital technologies** implemented in the primary and secondary substations (control/command, monitoring, dynamic OLTC, …)
- **Advanced software for network operation and dispatching** (LV and MV default **localization**, MV network **self-healing**, **Volt / Var regulation** …)
- Solutions contributing to an **active management of consumption and generation** (peak period management, electricity storage, etc.)

3 OUR EXPERTISE IN POWERGRIDS LINKED TO SMART TECHNOLOGIES

Smart services based on Linky technology: from conception to deployment and related services



Engineering services for Smart technologies implementation and enhanced supervision (SCADA, flexibility, automation/self- healing)



Tools for the optimal implementation of new producers / consumers (Renewables, charging stations..) on distribution Networks

Data Science, managing data and related new services

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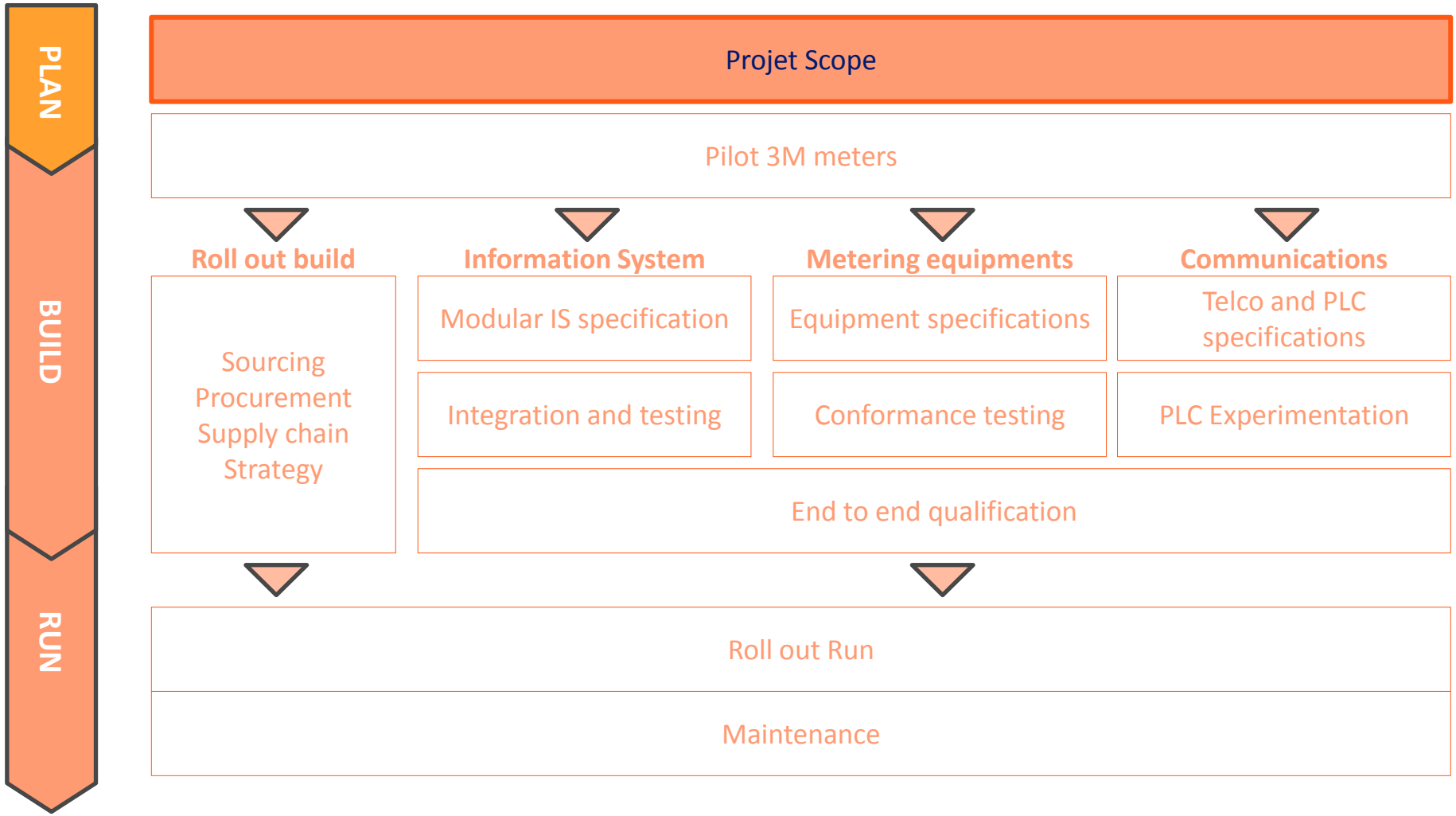
4. FOCUS ON LINKY EXPERIENCE IN FRANCE

PLAN PHASE MAP



4. FOCUS ON LINKY EXPERIENCE IN FRANCE

PLAN PHASE MAP - MAJOR GUIDELINES

GUIDELINES

- Expenses within the Business Plan
- High volume to be delivered
- Short period (6 years)
- Set of services

- Multiple vendors
- System ability to evolve
- PLC technology
- Focus on cyber security

IS requirements

- Modularity
- Scalability
- Security
- End to end / distributed intelligence

Metering equipement requirements

- Downloadable
- Interoperability (PLC)
- 20 years lifetime
- Qualification
- Security

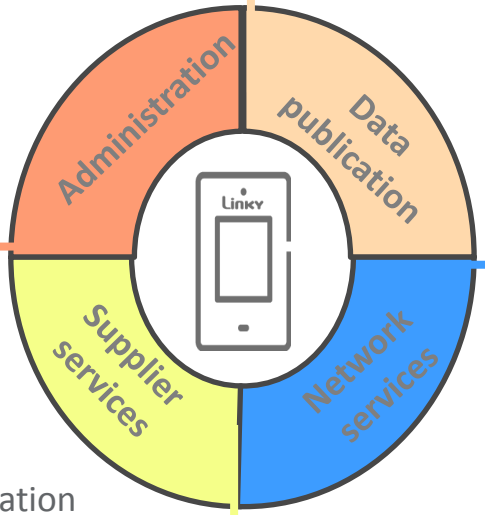
Business Process

- Mass roll out within 6 years
- Deployment outsourcing
- Multiple suppliers (supply chain)
- Security

4. FOCUS ON LINKY EXPERIENCE IN FRANCE
LINKY PHASE CATALOGUE

- Remote and local FW download
- Remote settings adjustment (meter and concentrator)
- PLC administration
- Security certificates management
- Meter and DCU Ping service

- Daily energy snapshots
- Load curve record activation / deactivation
- Power quality data (peak voltage)
- Meter logbooks
- Fraud events



- Remote programmation of contract informations (rates plans, …)
- « Pointe mobile » creation and activation
- Power limitation
- On demand energy data request service

- LV outage notification sent by the concentrateor (from PLC perspective)
- GIS cartography adjustement
- Power drop event (data concentrator)
- Binary (TOR) inputs events (data concentrator)
- Voltage failure event (Three-phase meter)
- Meter and DCU Ping service

4. FOCUS ON LINKY EXPERIENCE IN FRANCE
THE MILESTONES OF A PROJECT STARTED 10 YEARS AGO

The European Directive in favor of the development of smart meters is transcribed into the energy transition French law. French representatives endorsed in May 2015, the deployment of smart meters Linky, for individuals and professionals, to enable them to manage their energy consumption

EDF launched the study of a **new intelligent metering system**

End of the pilot phase, considered as a success. Data and experience are gathered and analysed

December, 1st : beginning of the mass roll out. 3 million smart meters will be installed between December 2015 and late 2016

2006 **Study / RFP** — 2009 **Testing & Pilot** — 2011 **Validation** — 2013 **Guidance** — 2015 **Roll out** — 2021

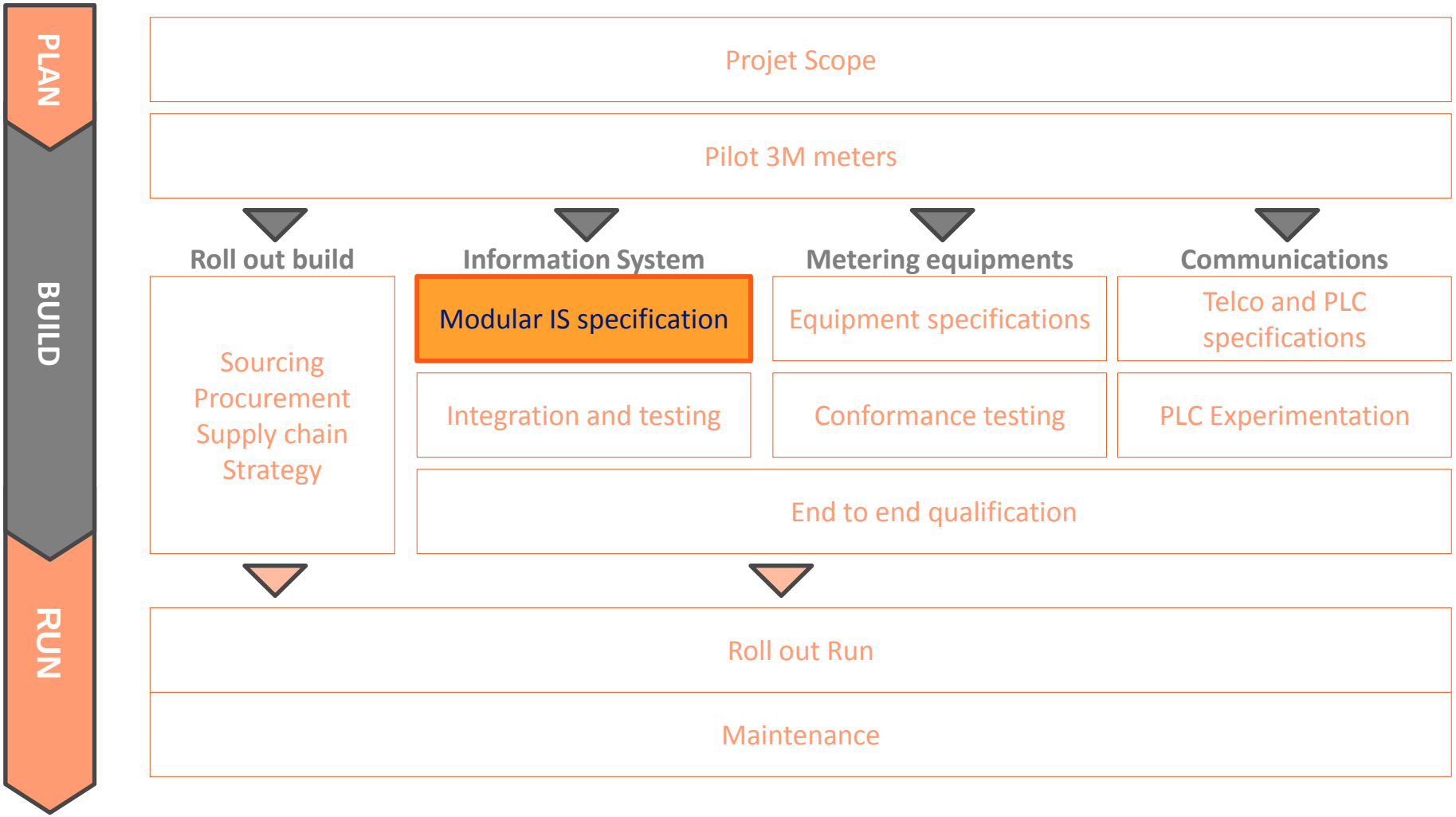
At the request of the Energy Regulatory Commission (CRE), Enedis launches a **testing of the new Linky smart meter with 300 000 customers**

Enedis issues the contract notice (OJEU) for the procurement of 3M meters (2,5M single-phase meters) as well as 80k data concentrators (First RFP)

The goal is to replace 90% of old meters in 35 million homes and install 700 000 concentrators in France by 2021

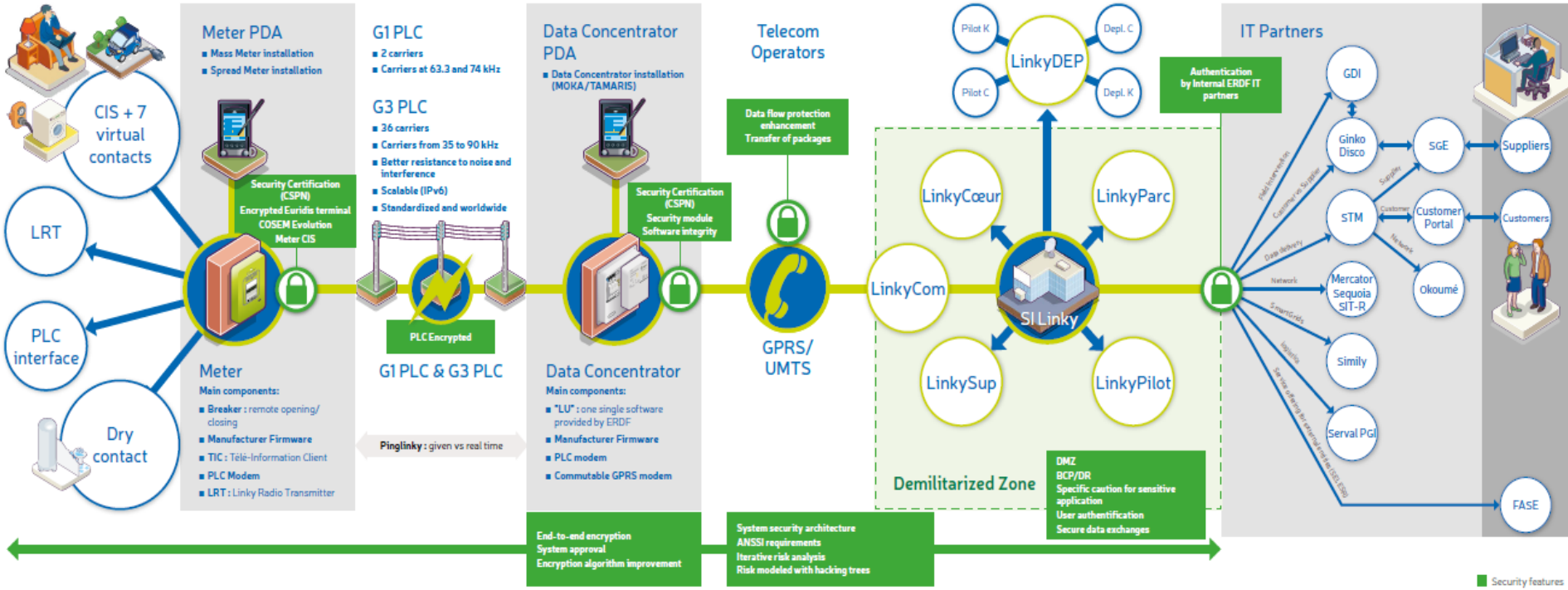
4. FOCUS ON LINKY EXPERIENCE IN FRANCE

BUILD PHASE MAP

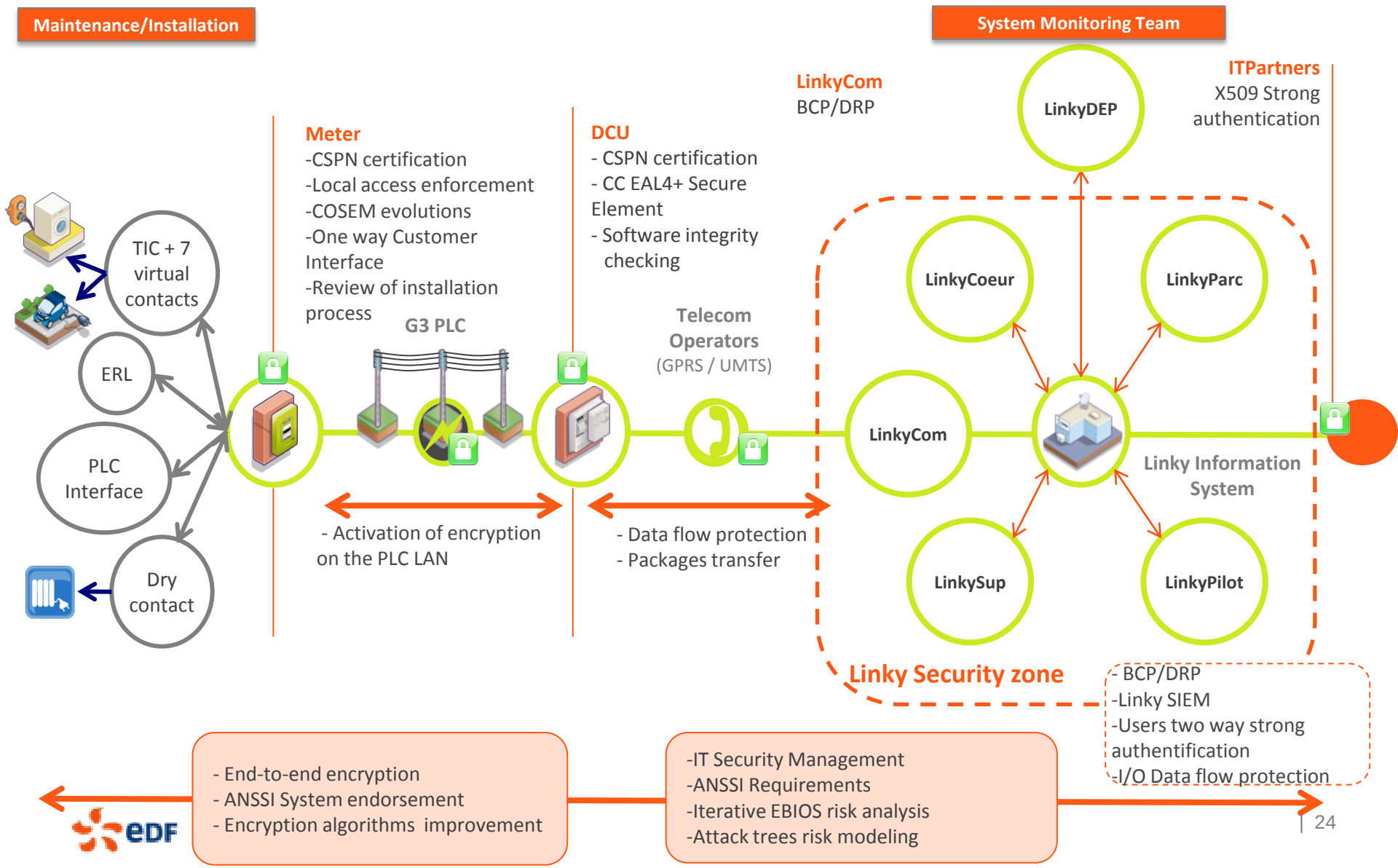


4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP – OVERVIEW OF THE LINKY SYSTEM

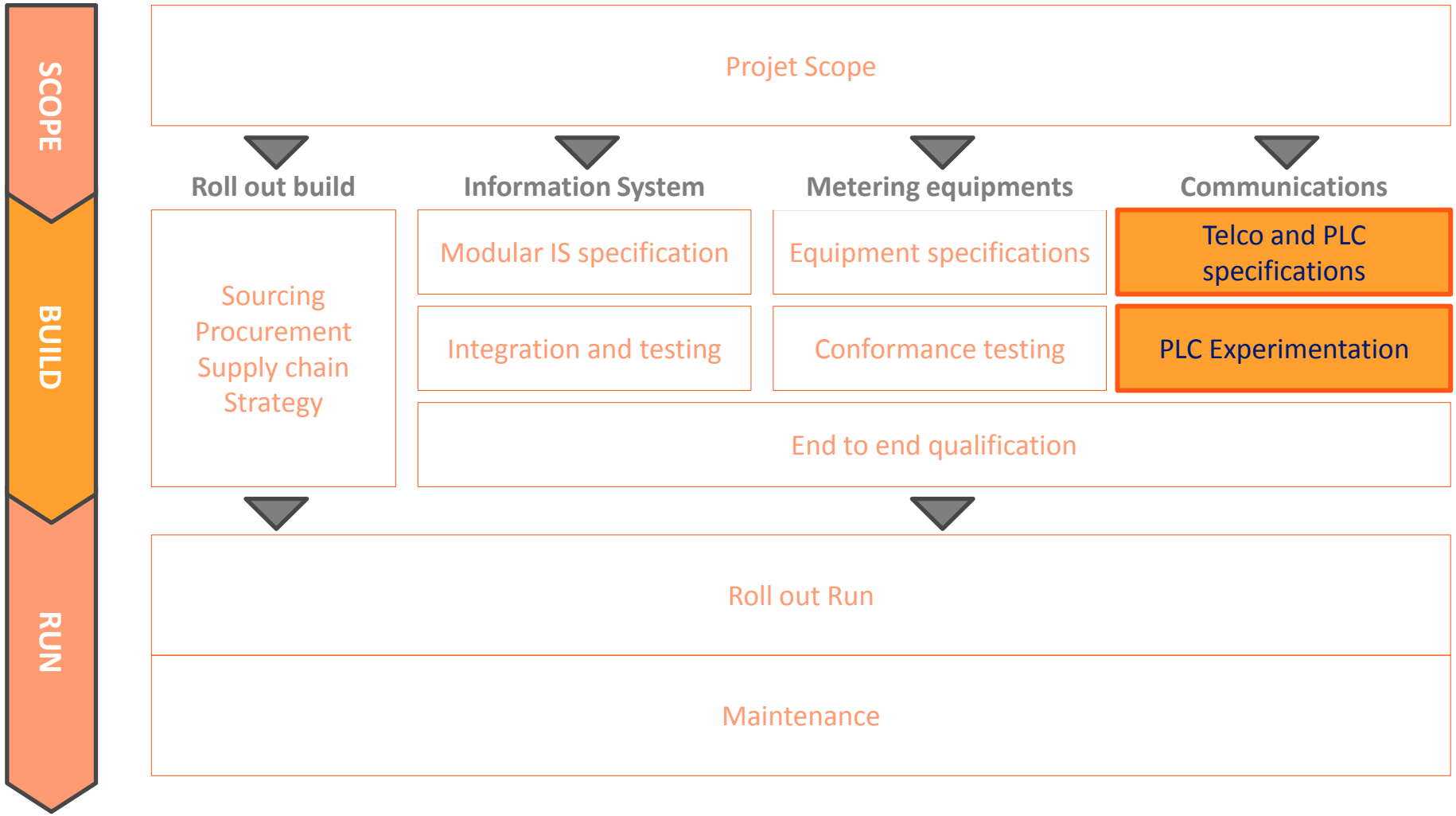
The Linky System



4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP – SECURITY IMPLEMENTATION



4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP



4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP – G3 PCL REQUIREMENTS

Back to 2007 **a tender was launched to define a new PLC protocol which resulted in G3-PLC**, with the requirements below

To be able to communicate in a reliable manner in a rough environment 	▪ Forward error connection ▪ G3 PLC adapted to noisy environments (robust mode @ -1dB SNR) ▪ SNR adaptation to propagation conditions
To be able to answer future needs 	▪ IPv6 native ▪ Ability to download FW over the power line ▪ Ability to accommodate future applications
Can operate with clusters from 2 to 1500 nodes 	▪ Forwarding Layer at level 2 or 3 ▪ Mesh network
Multi-sourcing and open solutions 	▪ Re-use whenever possible existing standards ▪ G3-PLC is an ITU standard served with a community of silicon and meter vendors (G3-PLC Alliance) which ensures better competitiveness
To communicate at high speed and securely 	▪ Max data rate G3 (CENELEC A) 42.6 kbps ▪ Max data rate G3 (FCC) 300 kbps ▪ Authentication (symmetric shared key) ▪ MAC frames Ciphering

4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP – G3 CPL ALLIANCE

- **Power line communication carries data on a conductor that is also used simultaneously for electric power transmission or distribution. G3 PLC is high-speed, highly-reliable, long-range communication and can function in harsh, noisy environment**

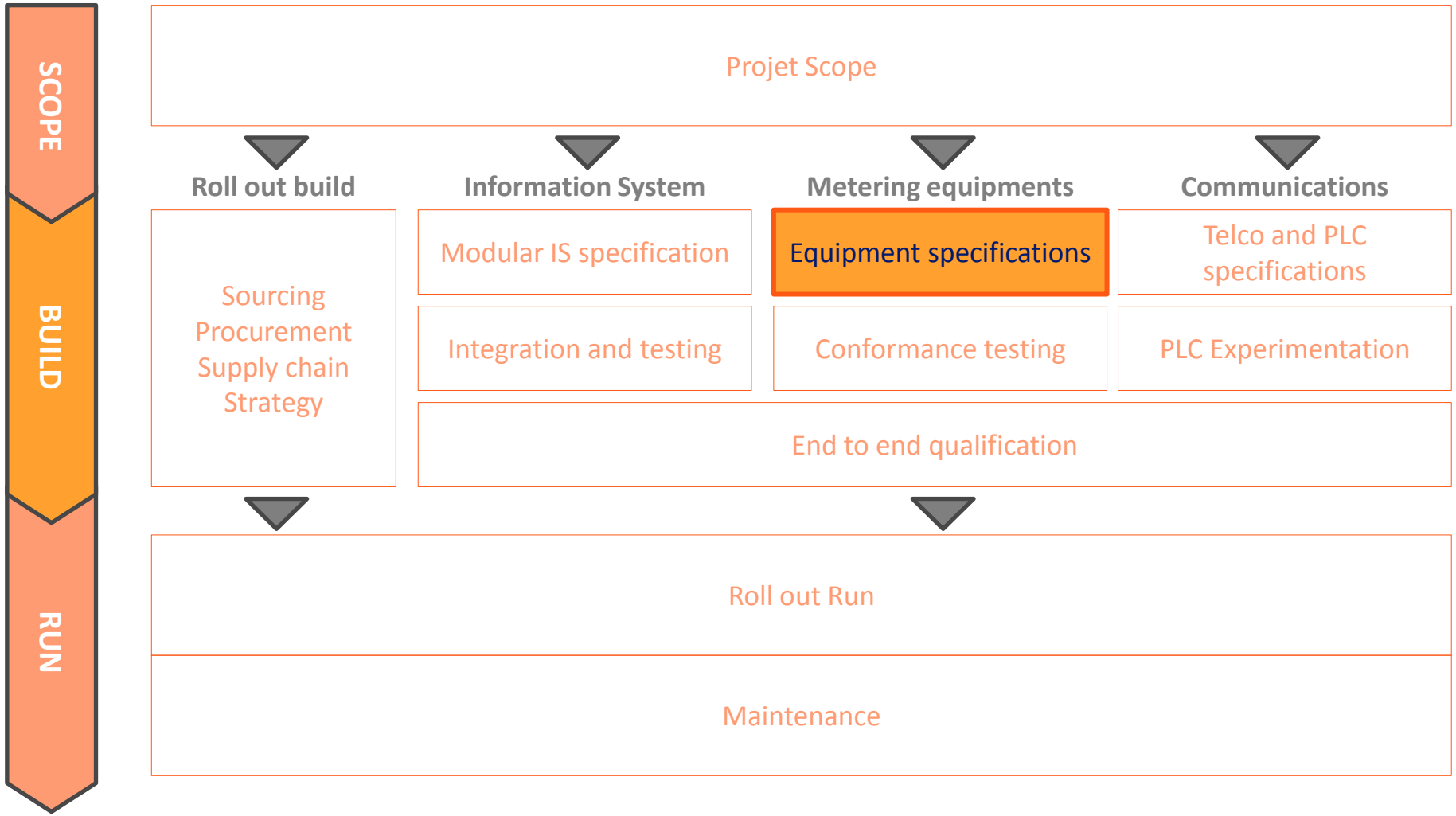
- **G3-PLC Alliance, sponsored by Enedis, is promoting G3-PLC technology in smart grid applications.**

Main objectives of the Alliance

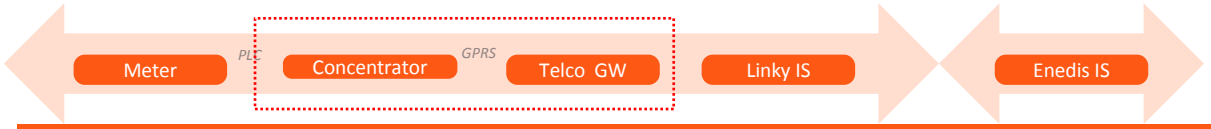
- Support G3-PLC in **internationally recognized standards** bodies to achieve the rapid adoption of G3-PLC specification worldwide
- Develop a framework for **equipment testing** to facilitate **interoperability** among G3-PLC adopters
- Educate the market and **promote the value, benefit**s and applications of G3-PLC

- 12 executive members (founding members)
- More than 50 active or Participating members
- Members have regular meetings and working groups

4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP

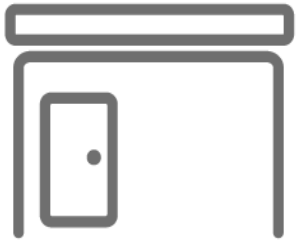


4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP – DSU LOCATION AND CONNECTION



Data concentrator location

In the MV/LV station



On a power pole

On the ground (electrical box)

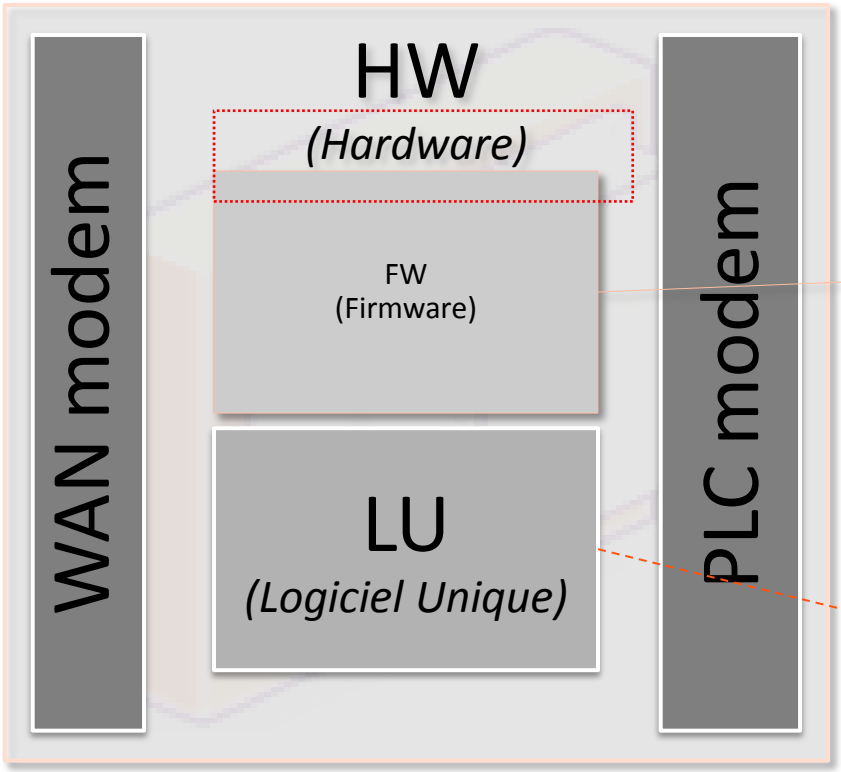
Data concentrator power connection

- It is always connected to the three phase grid
- It is connected between the transformer and the LV panel , or downstream

Data concentrator electrical features

- Temperature operating range must be extended
- Immunity to radiated and conducted disturbances
- Electric isolation of communications components

4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP – DCU ARCHITECTURE



Concentrator FW

The software is provided by the manufacturer and is the low level software on which the LU can operate
It manages what is related to the equipement (drivers), but not the business functions. It must be stable

LU (Logiciel unique)

The software is provided by Enedis
It manages :
- functions that are not related to the equipement
- business needs, which might change frequently

4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP – DCU ARCHITECTURE

The LU manages high level exchanges with IS
- Remote operations requests and associated data

The LU manages high level exchanges with the meters
- Elementary operations fragmentation
- Planning
- Report

Requests

IS

TELCO GW

GPRS + IP, OMA-DS, FTP, SNTP

HW

WAN modem

LU (logiciel unique)

FW (firmware)

PLC modem

COSEM

METER

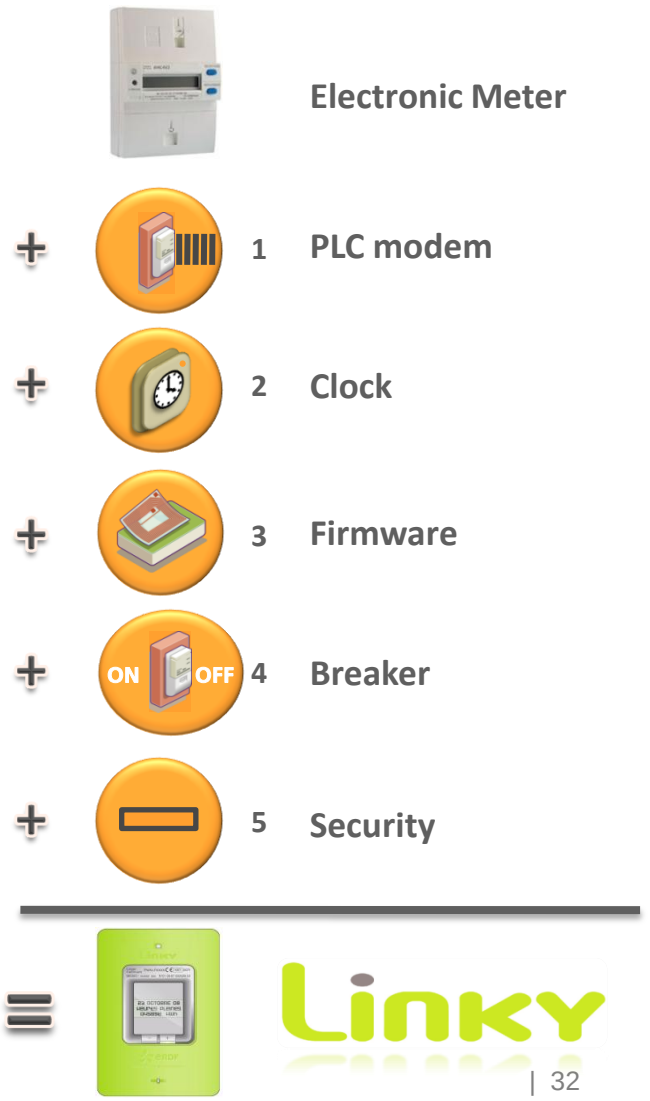
PLC

The FW drives Telco interface to the LinkyCom Server, enabling high level protocol (discovery, collection and download planning)

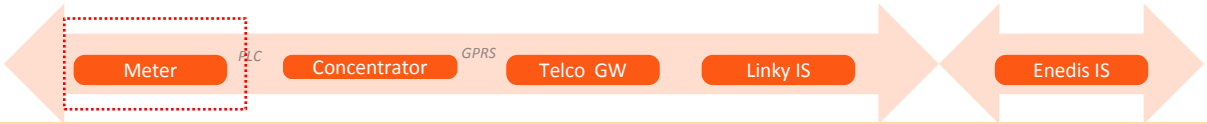
The FW manages « transport layer « to the meters
- PLC frames
- PLC supervision

4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP- METER REQUIREMENTS

- The Smart meter is based on its predecessor platform (Electronic meter), and holds in the same volume
- It implements **5 new major features**, designed to met the needs

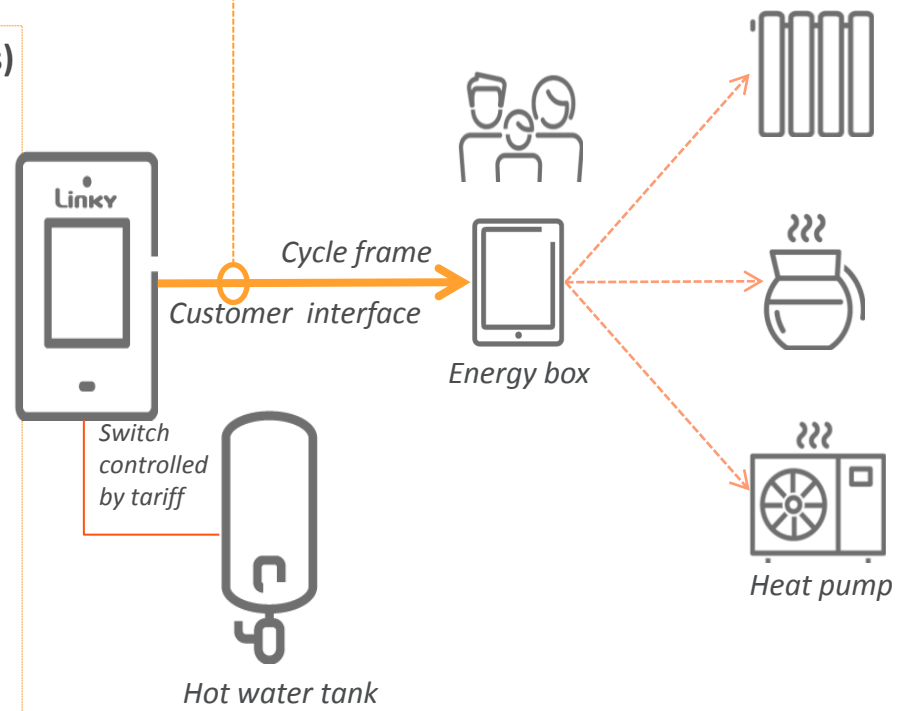


4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP- METER REQUIREMENTS

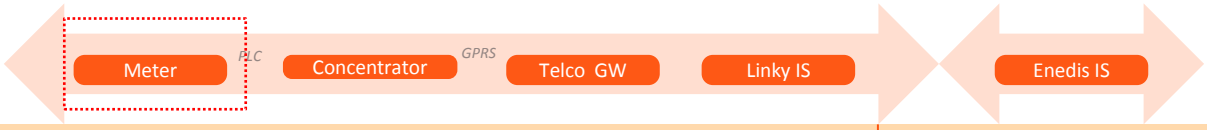


Customer interface enables energy demand management

- **Main informations sent through the interface (freq 2s)**
  - Supplier contract
    - rate plan
    - virtual contacts positions
    - peak / off peak informations
  - Usage
    - 10 energy registers
    - max current / max daily power
    - max power reach alarm
    - producer and consumer load curve
  - Other
    - meter logbooks (breaker, cover, quality)
    - meter status and errors registers
- **Medium**
  - Wireline + radio



4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP- METER REQUIREMENTS



Electronic meter Measures

Contract
Supplier

Mode
Consumer mode

Active energy
6 registers

Reactive energy

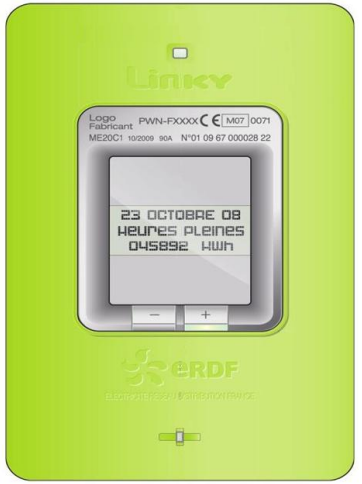
Smart meter Measures

Mode
Consumer mode
Producer mode

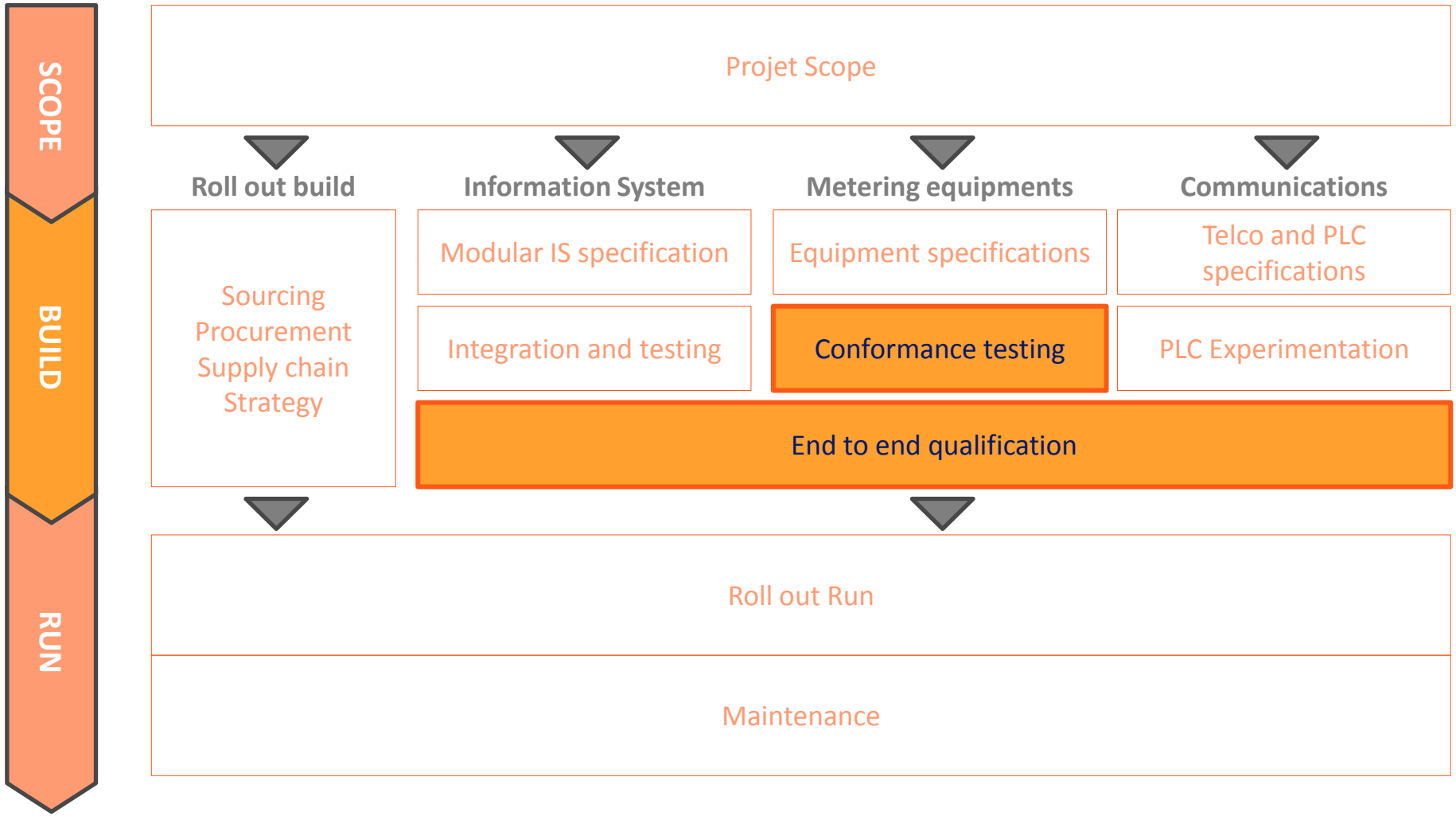
Contract
Supplier
Grid

Active energy
1 Total register 10 Supplier register 4 Distributor register 1 Generation register

Reactive energy
4 registers (generation)



4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE



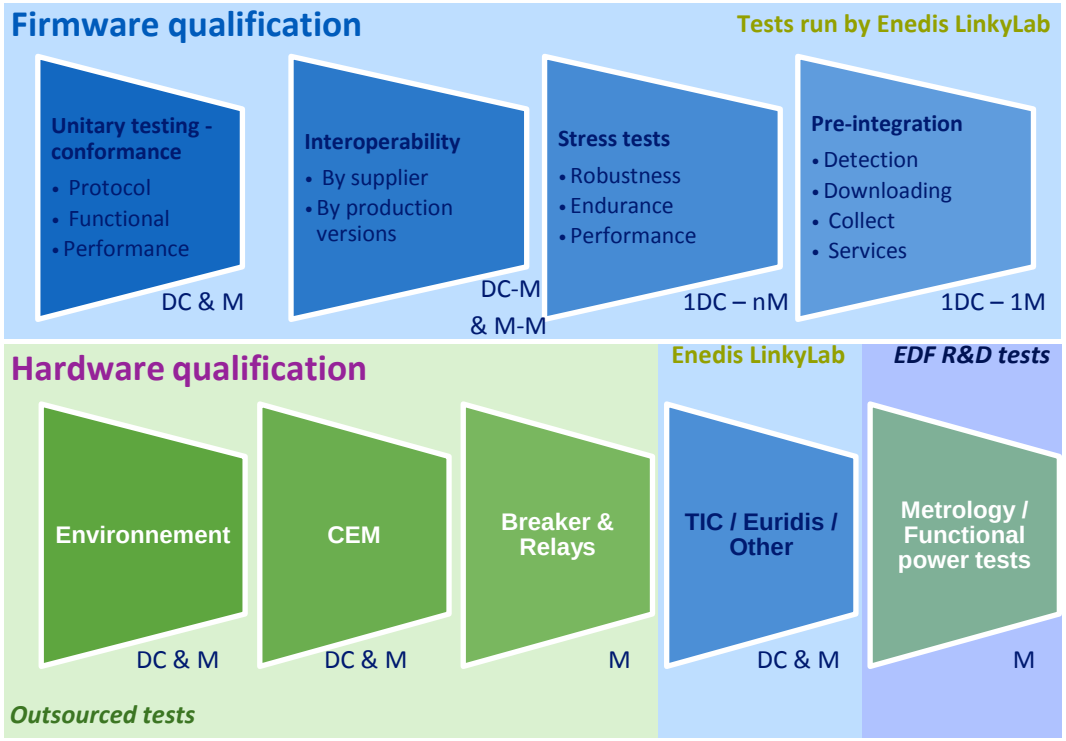
4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP-QUALIFICATION OF METERING EQUIPMENTS

The turnkey approach abort lead to **expand the role of metering product management** → Strengthened activities

Specifications	▪ Add **quality requirements** to the specifications ▪ **Performance note** in the context of the meters environment ▪ **Critical components identification**
Conception / Development	▪ **Certification requirements** (security, legal metrology, …) ▪ **Audits and Factory Acceptance Tests** ▪ Vendors internal tests results
Pilot series qualification	▪ **Qualification in laboratory environment** (Enedis + external partners) ▪ **Pilot series production line validation and qualification** ▪ **Integrated acceptance tests** and performance tests **in network environment**
Production series	▪ **Acceptance tests of production series products** ▪ Batch control of criticial components ▪ Stronger requirements on maximum failure rates
Maintenance	▪ **Maintenance support** elaboration ▪ **Vendors commitments verification** ▪ **End to end supply chain** setup

4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP- METERING TESTS

In addition to the suppliers' tests, **FW and external interfaces tests are run or steered by Enedis** on prototypes and pilot series. HW tests are **run by EDF R&D and external laboratories**



Meters : 2 500 FW tests
DC : 1500 FW tests

DC : 45 HW tests
Meters : 93 HW tests

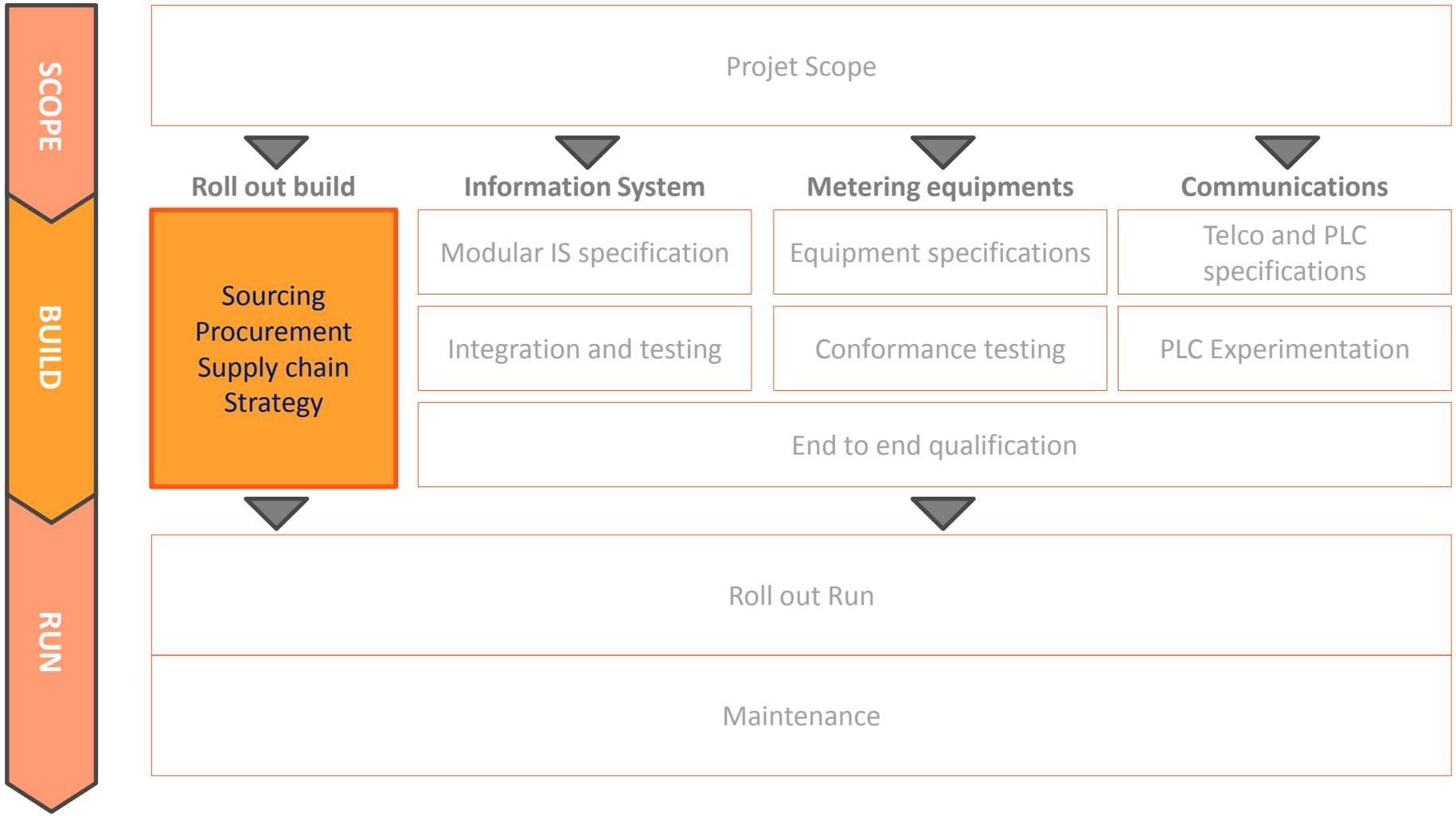
DC = Data Concentrator | M = meter | FW = Firmware | HW = Hardware

4. FOCUS ON LINKY EXPERIENCE IN FRANCE

BUILD PHASE MAP- LINKY LAB

LinkyLab - The Industrial Testing Laboratory for Linky Equipment

4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP



4. FOCUS ON LINKY EXPERIENCE IN FRANCE

BUILD PHASE MAP – ROLL OUT BUILD OVERVIEW

Roll out BUILD

Roll out Strategy	*Industrial Strategy*	*Supply strategy*
Three-stage roll out Local employment Communication Cost effectiveness	Roll out tender guidelines	Procurement of metering equipment and central IS

Roll out RUN

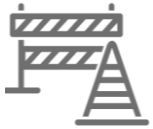
4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP – STRATEGY FOR ROLL OUT SERVICES PROCUREMENT

Major issues of the industrial strategy are : **selecting as much reliable partners in the long run as possible** to mitigate risks and foster competition as well as **take into account the whole value chain** (vendors, subcontractors, Enedis, customers)

Guidelines for Linky roll out bids procurement

- **Favor the use of multiple roll out contractors vs one big market player**
- **Long term roll out contracts** for predictability and cost optimization
- **Steady volumes throughout the roll out phase**
  Yet production flexibility clause to enable changing rates of roll out

Implementation

-  **Completed = first package of workforce contract (10M) :** European Notices of tenders for the procurement of roll out delivery (2014/07) and contract closing (2015/06)
-  **Ongoing = second package**

4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP – STRATEGY FOR SUPPLY MANAGEMENT

Supply strategy aims at **securing the execution of the industrial strategy and the supply of metering equipements**.
It is driven mainly by the **high volumes** to be met

Guidelines for Linky metering equipment supply :

- **Market opened to new vendors to cope with high volumes**
- **Ensure product quality**
  - Only qualified vendors can compete in the RFP process
  - Qualification process for early failures prevention
- **Control the supply to DSO and ROS (*)** and ensure equipment tracking
- **Reduce the risk of default**
  - At least 2 awardees for a given product
  - Monthly production capacity required for each vendor
  - Contractual security stocks
  - DSO security stock

(*) roll out contractors

4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP – ROLL OUT STRATEGY

The « leopard » roll out pattern was a consensus between every stakeholder. It enables **roll out in all regions at the same time**, it is designed to **optimize operational costs**, and **build upon sustainable resources of local employment market**

Cost effective

Roll out first areas where intervention costs are high
Without disrupting billing cycle

Local Employment

Enedis can not withstand volumes on its own
Roll out outsourcing also for social reasons

Public relationships

Concession agreement renewal
Rollout outlook to local authorities
Regulatory incentives

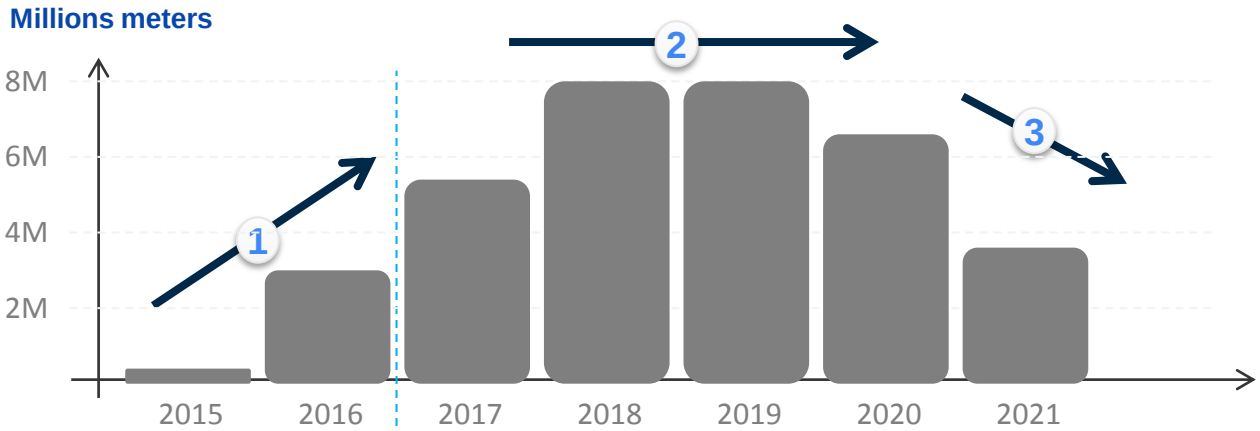
Three stages roll out

Secure supply

4. FOCUS ON LINKY EXPERIENCE IN FRANCE
BUILD PHASE MAP – THREE STAGES NATIONAL ROLL OUT

National Roll out is **a three steps process** aiming at ensuring controlled delivery of 35M meters

Total volume
35 M meters

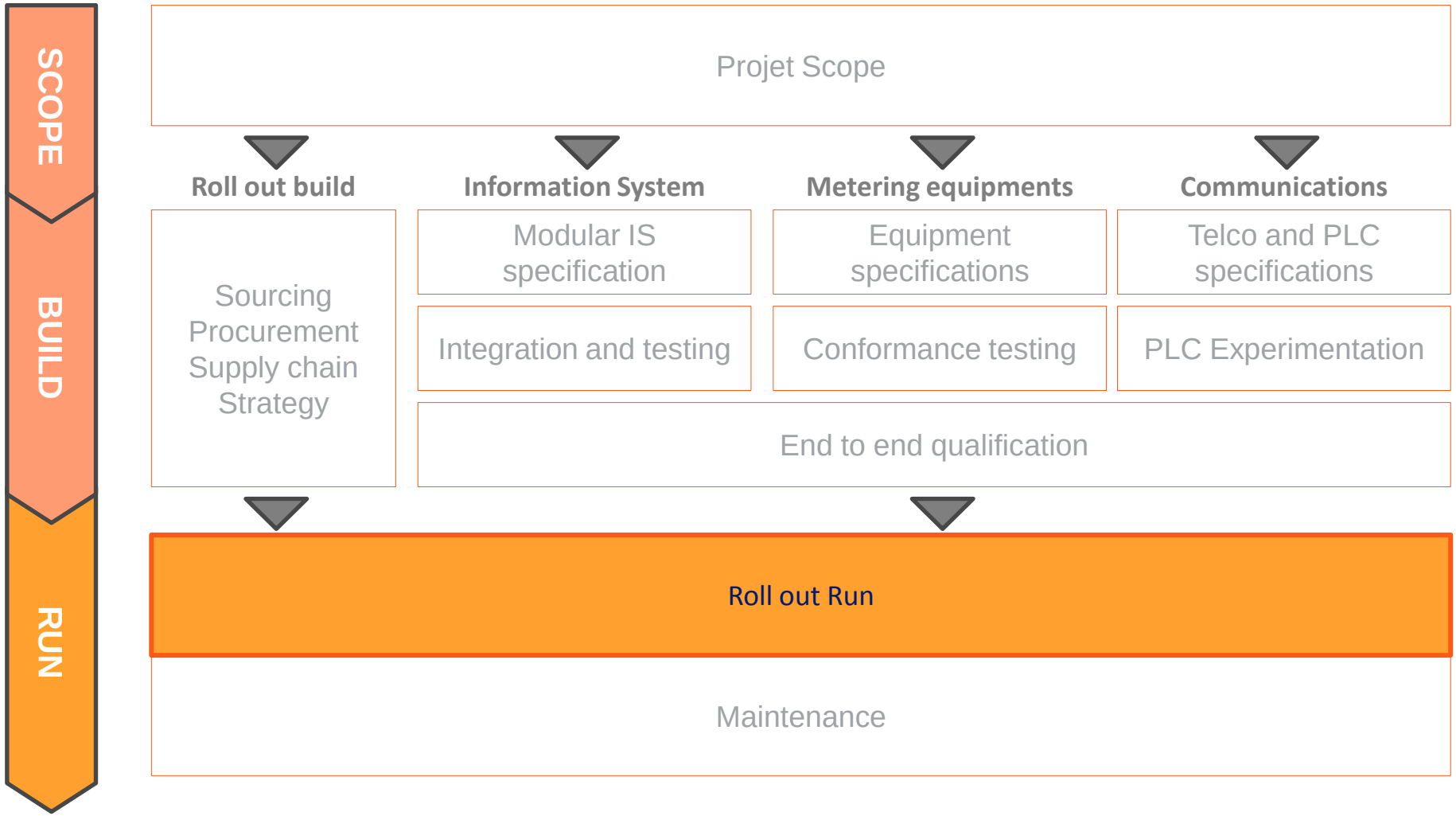


1 **Step 1** = **Progressive ramp-up** during the first two years in order to accomodate new vendors and tune manufacturing processes

2 **Step 2** = **Roll out is at full development** during almost three years, **providing regular volumes** as a foundation of **predictabiliy** for roll out activities trough long term contracts

3 **Step 3** = **Gradual reduction of volumes** in order to control smooth stop of roll out activities, to prepare the transition to the exploitation phase (maintenance)

4. FOCUS ON LINKY EXPERIENCE IN FRANCE
RUN PHASE MAP



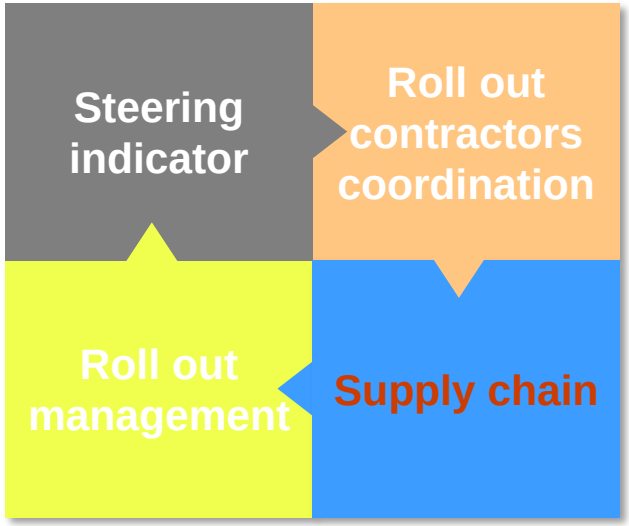
4. FOCUS ON LINKY EXPERIENCE IN FRANCE
RUN PHASE MAP – STEERING ORGANIZATION

The roll out of meters is managed by regional units and must respect **precise objectives in terms of quality, cost and delivery**. A specific organisation is set in order to **control compliance to the objectives** and **mititage roll out risks**

Main objectives of the national steering

- Assess risks at national level
- Ensure global coherence in terms of contract application
- Secure the supply chain from the manufacturing plant to the roll out contractors or Enedis desks
- Control financial impact of stocks
- Enable regional units deployment operations

4 missions

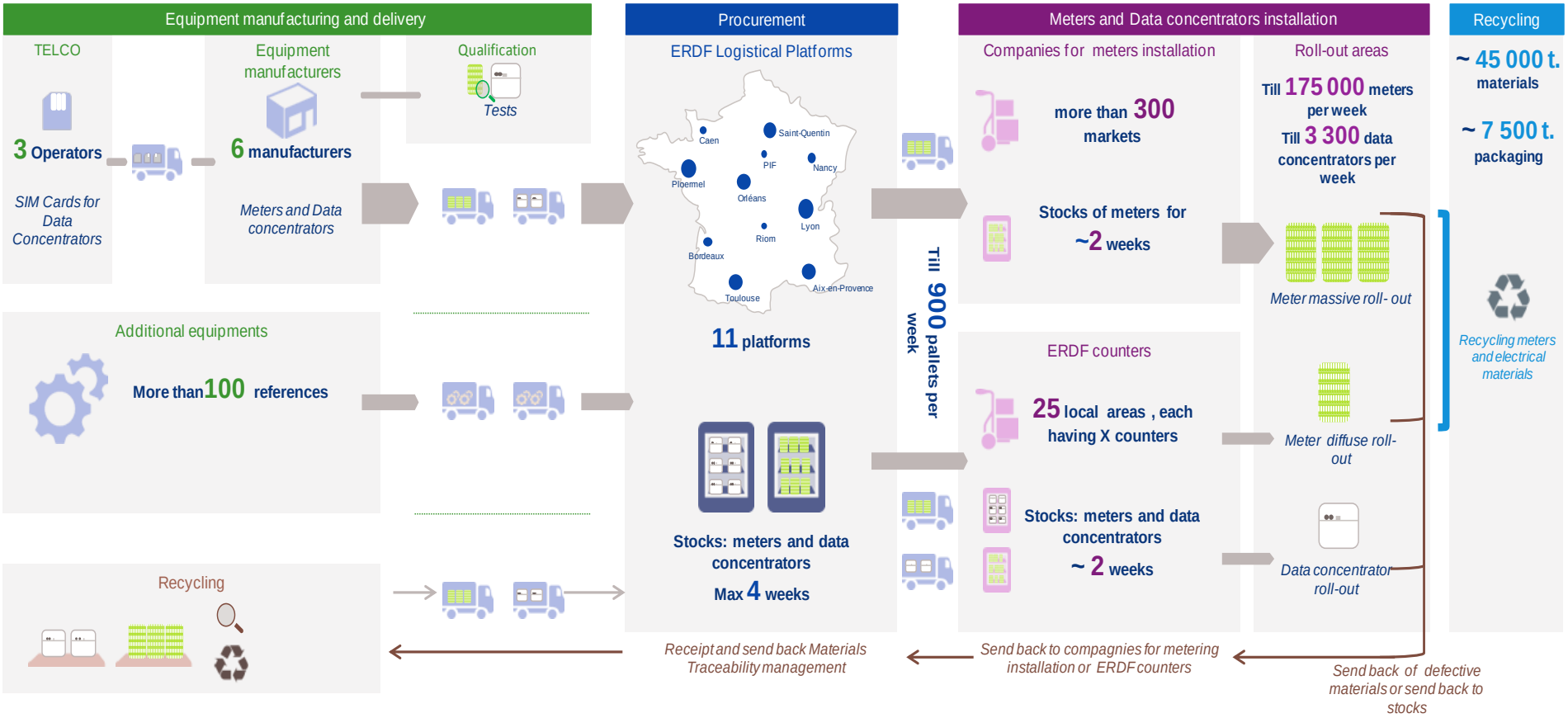


1 control tower = the COD (Centre opérationnel de déploiement)

Roll out coordinators	Control objectives compliance, support to regional units
Roll out analysts	Ad hoc or recurring analyses + forecasts

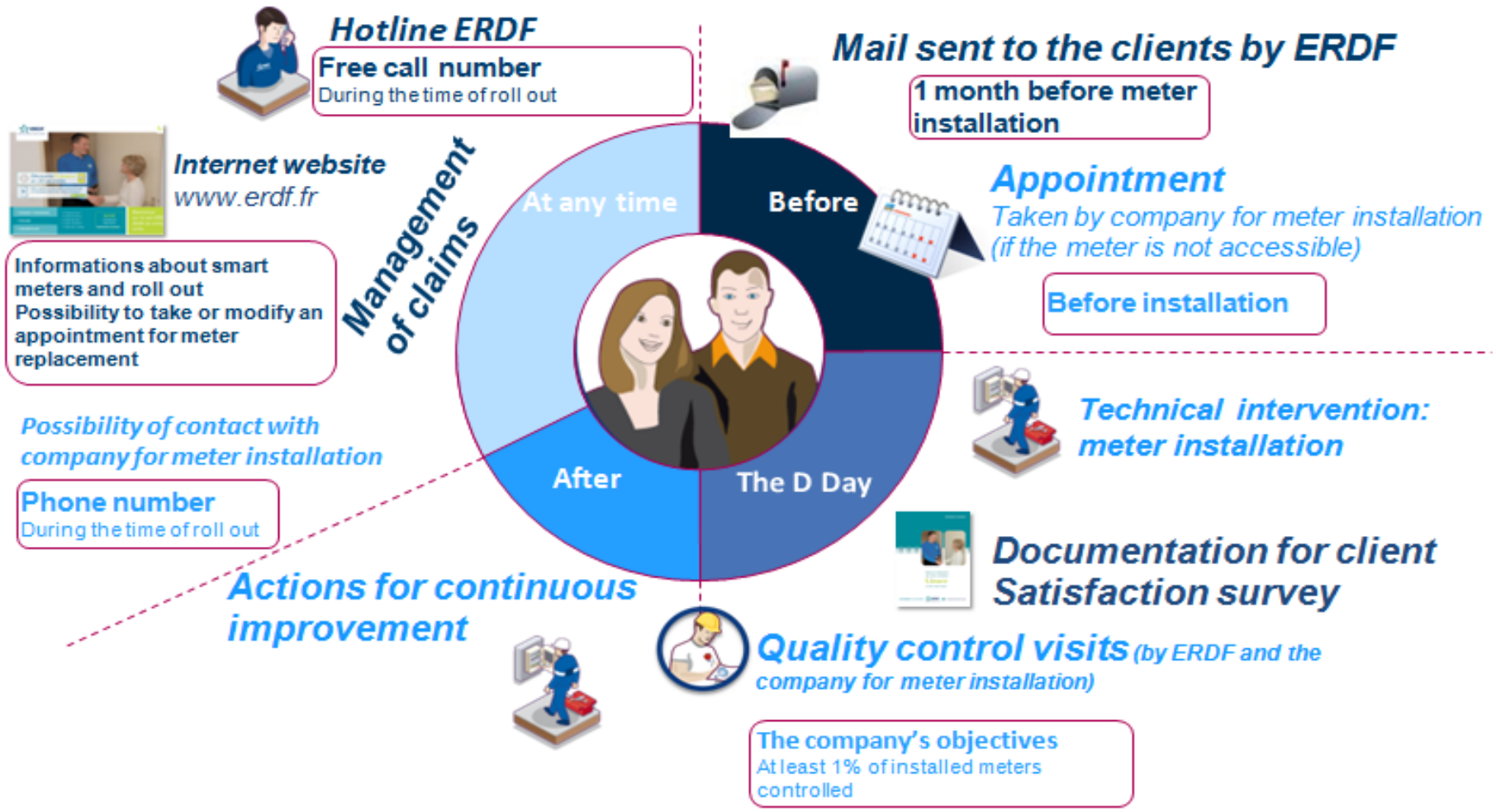
4. FOCUS ON LINKY EXPERIENCE IN FRANCE

RUN PHASE MAP – SUPPLY CHAIN FIGURES



4. FOCUS ON LINKY EXPERIENCE IN FRANCE

RUN PHASE MAP – CUSTOMER CARE



4. FOCUS ON LINKY EXPERIENCE IN FRANCE

RUN PHASE – ROLL OUT

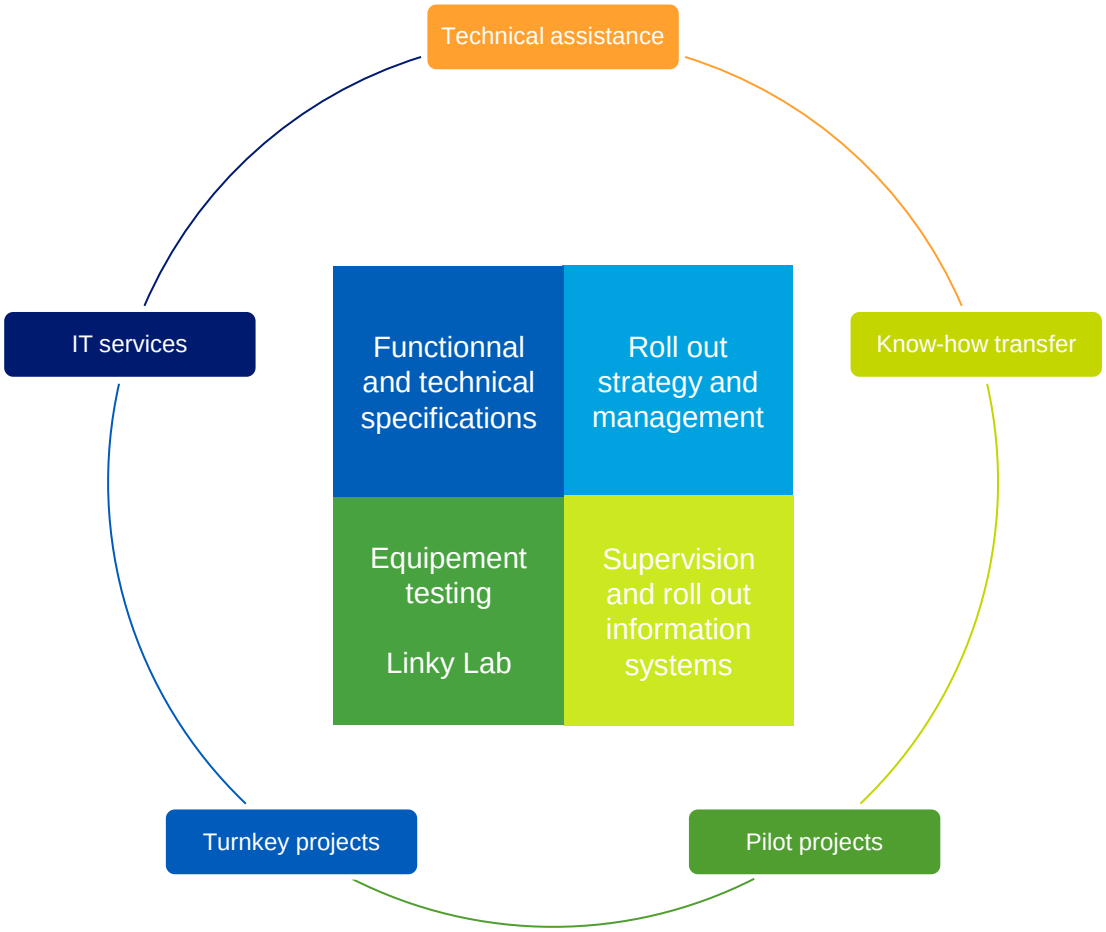
The roll-out of the Linky Smart Meter

MEETING HEP EDF IN
TENTATIVE AGENDA

1. **HEP issues and ambition on smart-metering**
2. **Why EDF International Networks ?**
3. **Our expertise on Smart technologies**
4. **Focus on Linky experience in France**
5. **Highlight on some EDF IN references**
6. **Exchanges on potential collaboration**

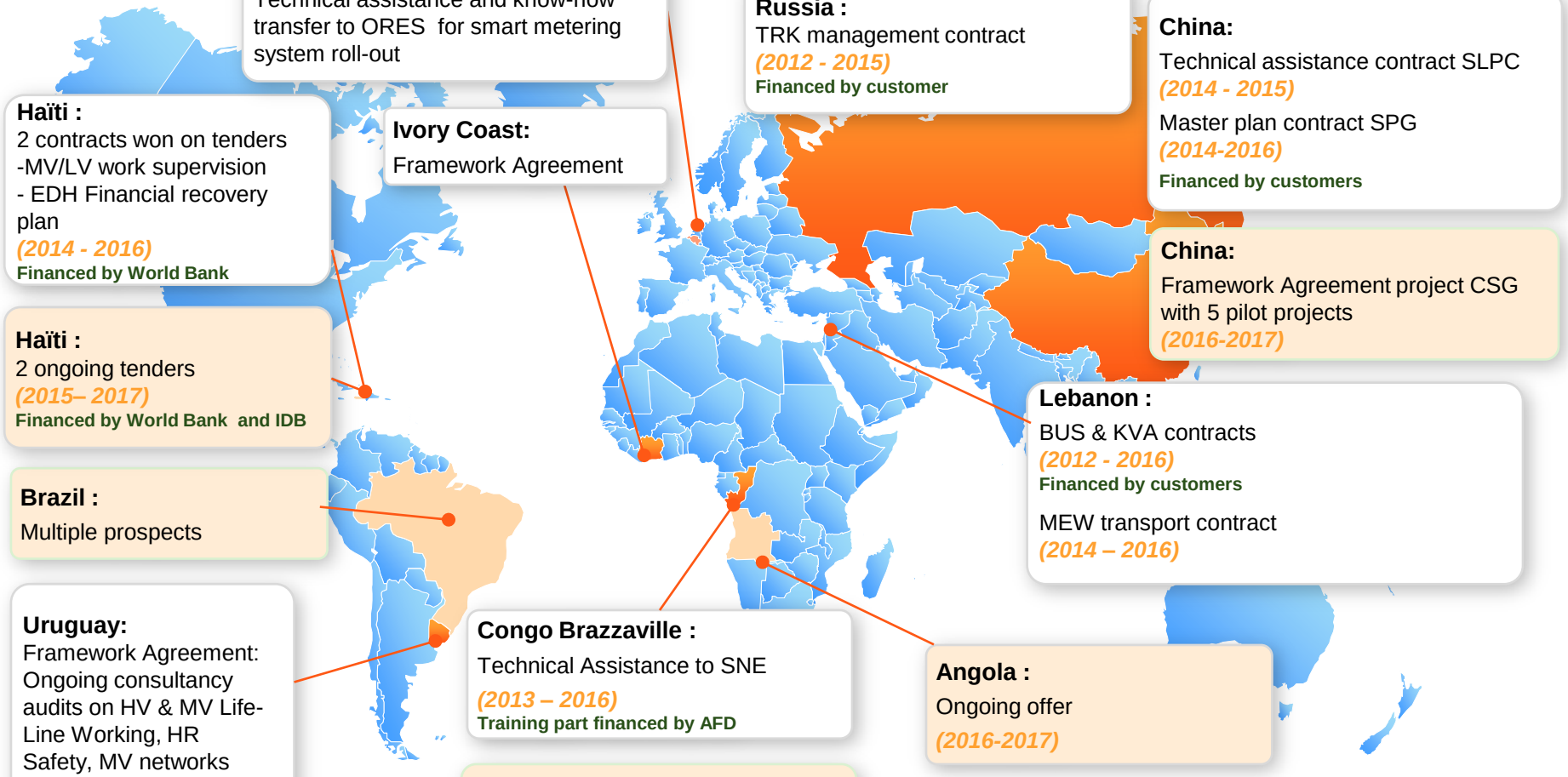
3.1

OUR OFFER ALONG THE VALUE CHAIN



6 OTHER REFERENCES (2/2)

SELECTION OF RECENT ON GOING PROJECTS & CONTRACTS



Belgium :
Technical assistance and know-how transfer to ORES for smart metering system roll-out

Russia :
TRK management contract
(2012 - 2015)
Financed by customer

China:
Technical assistance contract SLPC
(2014 - 2015)
Master plan contract SPG
(2014-2016)
Financed by customers

Haïti :
2 contracts won on tenders
-MV/LV work supervision
- EDH Financial recovery plan
(2014 - 2016)
Financed by World Bank

Ivory Coast:
Framework Agreement

China:
Framework Agreement project CSG with 5 pilot projects
(2016-2017)

Haïti :
2 ongoing tenders
(2015– 2017)
Financed by World Bank and IDB

Lebanon :
BUS & KVA contracts
(2012 - 2016)
Financed by customers

MEW transport contract
(2014 – 2016)

Brazil :
Multiple prospects

Uruguay:
Framework Agreement: Ongoing consultancy audits on HV & MV Life-Line Working, HR Safety, MV networks automation,consultancy 2013-2016

Congo Brazzaville :
Technical Assistance to SNE
(2013 – 2016)
Training part financed by AFD

Angola :
Ongoing offer
(2016-2017)

Congo-Brazzaville :
Ongoing additional offer
(2016-2017)
Financed by AFD and World Bank

MEETING HEP EDF IN
TENTATIVE AGENDA

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