Linky
The smart metering project of ERDF

IDRI Taipei, August 2011

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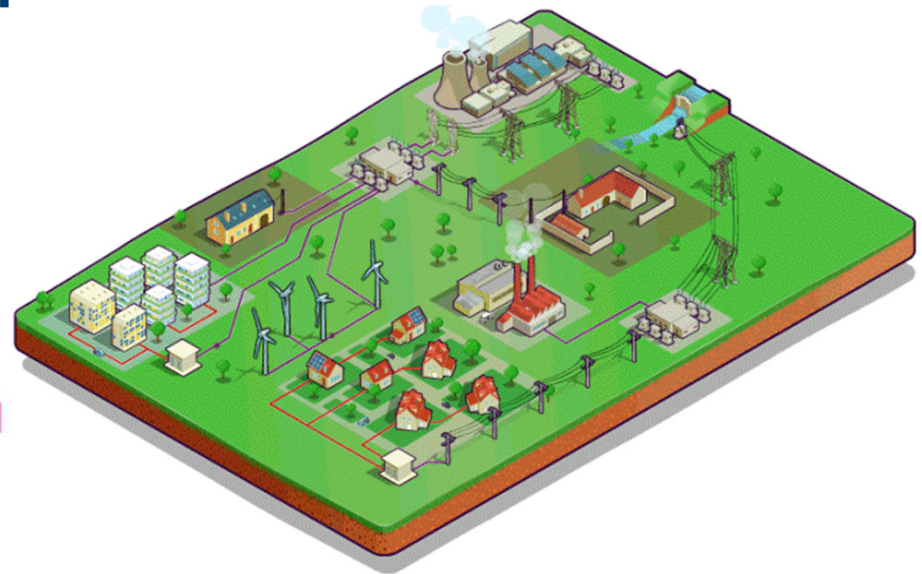
Linky, an ambitious pilot...
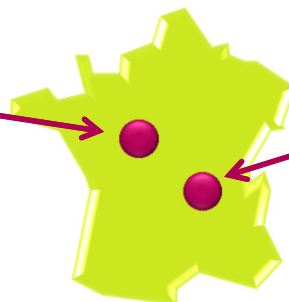
III 3 main targets

| Check the roll-out processes | Build the Linky IS | Confirm financial hypothesis |

III 300.000 customers & 2 regions

III Touraine

100.000 customers

Mainly rural

33 inh / km²

III Lyon

200.000 customers

Urban

1.750 inh / km²

III A 24 months pilot

2009 march   **2010**   **2011 march**

Substations preparation   **Data concentrators installation**   **Meters** installation

... and a successfull one !

March 31st, 2011 : end of field operations. Main results

III **4,600** DC installed (99%)

III **250,000** meters changed (90%)

III **92%** of the meters communicate

III **98%** of tele-operations are achieved in less than 48 hours

III **30 mn** (average) to replace a meter

III **1,500** meters changed per day (average)

III Less than **1%** claims

The end of the massive roll-out expected in 2018

III Share our lessons learnt
with the public authorities in order to obtain their GO as soon as possible

III Start our generalised roll-out (2013)

III Work with industrials ready to start quickly

III Use the PLC « G1 »

III Prepare the future (2015)

III Confirm PLC « G3 » possibilities through a specific pilot

III Develop the smart grids network functionalities for the system

III Take part to the development of DSM services

III Include Linky technologies into ERDF international offers

« GO ! »

2009   2011   2018

Experimentation   Generalisation, by step

summer
2011

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Linky, of course is an electric meter...

CBE

1 **PLC modem**

2 **clock**

3 **improved software**

4 **switch** ON OFF

5 **encryption**

|||| **Designed from "CBE" functionalities**

|||| **In the same volume as this,**

|||| **With 5 main supplementary attributes**

|||| **Responding to customer expectations.**

= **Linky**

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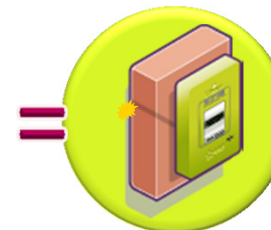
… but first of all, it's a system

Linky	PLC	Data concentrator	GPRS	Linky IS

To the customer's equipments

To ERDF other IS (billing , OMS, SCADA, etc..)

Customer   LV network   Secondary substation   Telco network   Control room
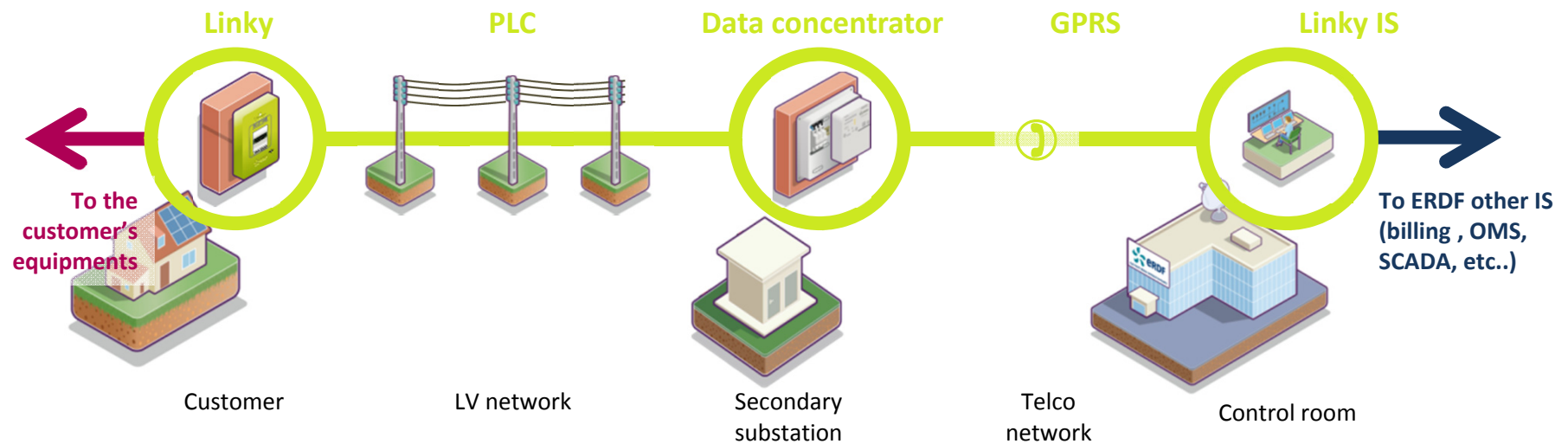
III **INTEROPERABLE** (interchangeable equipments, standard communication protocols)

III **2-WAY** (communication in both directions)

III **UPGRADABLE** (scalable system and components, step by step)

ERDF industrial policies

2 different contract s for building the whole system

- IIII 1 call for tender for the Pilot project: turn key contract trusted to Atos
- IIII 1 (or 2) call for tender for the generalization: n contracts (1 by supplier)

Open specifications

- IIII Detailed specifications for the meter, the concentrator & PLC
- IIII A third party checked the specifications by building a PLC modem

Interoperability

- IIII 3 manufacturers of meters (L&G, Itron & Iskraemeco)
- IIII 2 manufacturers of concentrators (L&G & Itron)

Unique software for all data concentrators

- IIII Ensure the same functionalities everywhere
- IIII Possibility to have other manufacturers.

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New advantages for the client, today…

Without Linky
sources of unsatisfaction

Linky's benefits

IIII **Invoices bases on estimations**

IIII **Be at home for the reading**

Daily remote readings

IIII **Be at home for interventions**

70% of work done remotely

IIII **Time between a demand and an intervention**

24h vs. 5 days
7 Days a week

Linky

… and tomorrow !

Consumption management thanks to
① **Better information**

Through the Linky system

||||||||||||||||||||||||||||||||||||||||||||

On the web

By wire or radio

||||||||||||||||||||||||||||||||||||||||||||

On an IHD (In Home Display)

② **Equipments control**

8 interfaces

Linky

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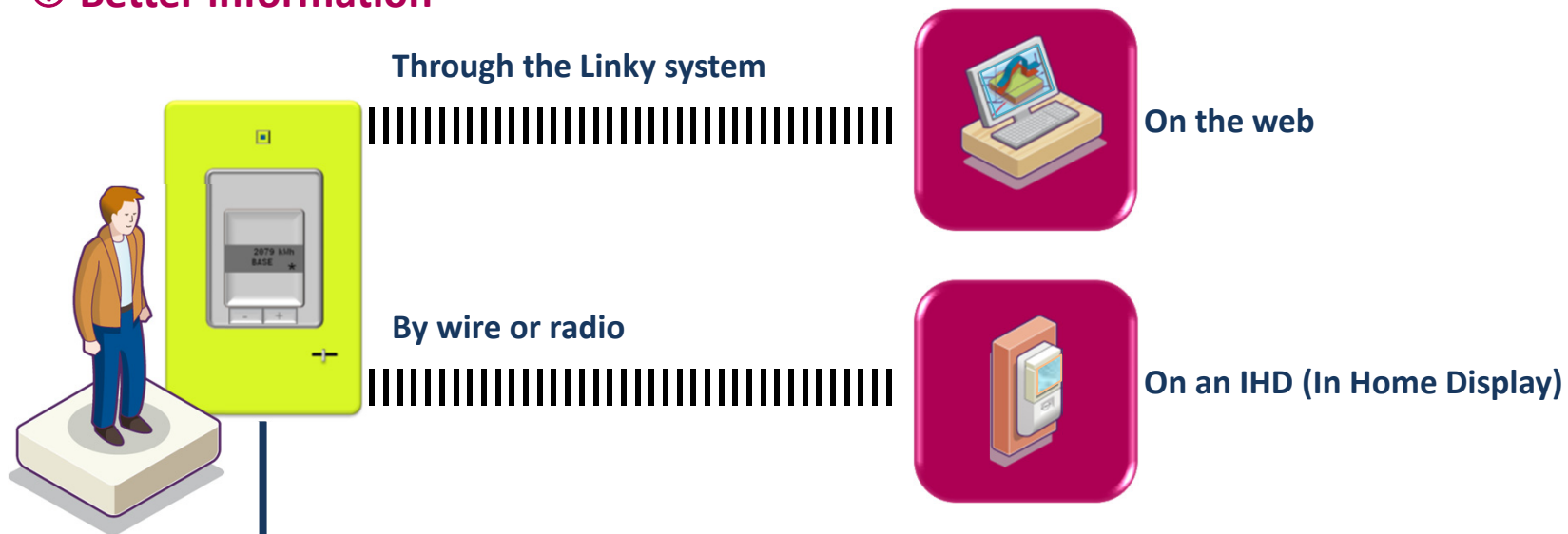
Linky is also an essential building block for the Demand Side Management

| Information to the customer facilitating demand control | **Making consumption data and associated services available** |

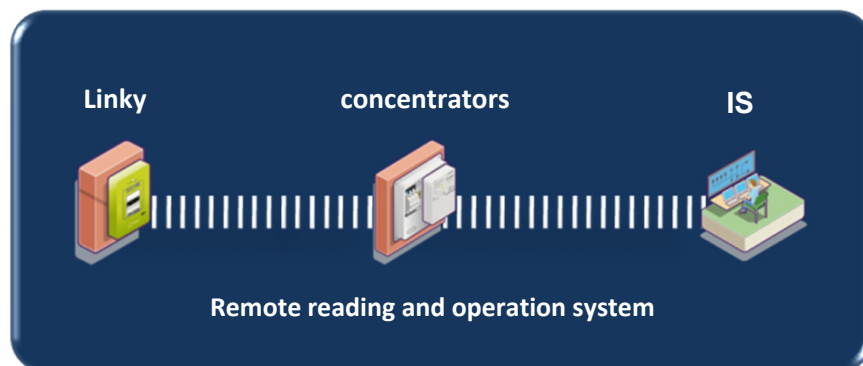| A range of tariffs and incentives, offered by the suppliers | **Advanced tariff scheme for suppliers** |

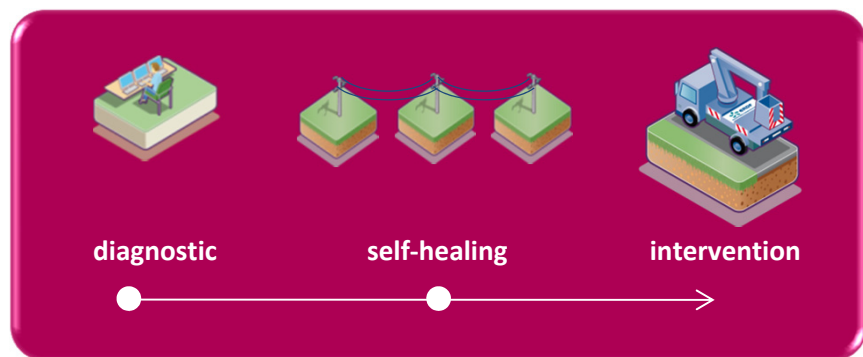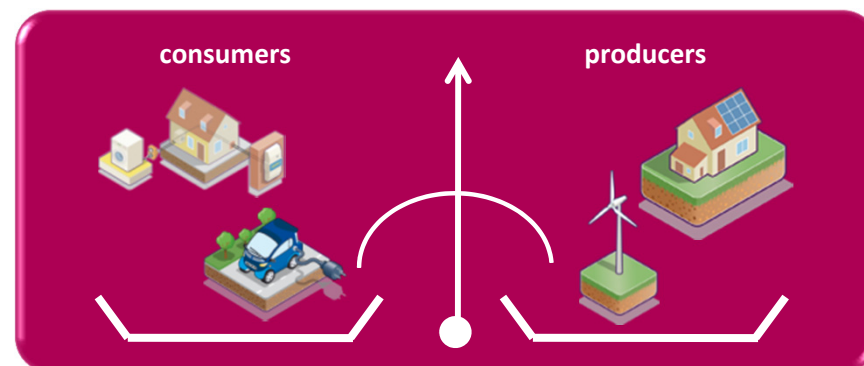| Indirect load shedding, to reduce peak demand | **Control of remote devices and associated services** |

Linky **DSM**

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For ERDF, Linky can be considered as the 1st building block for smart grids

Remote control
via AMM

Linky   concentrators   IS

Remote reading and operation system

Managing the local balance
production / consumption

consumers   producers

A faster intervention time
on networks

diagnostic   self-healing   intervention

IIII Collection system (Linky) and data management

IIII Risk management and preventive maintenance

IIII balancing of LV network phases
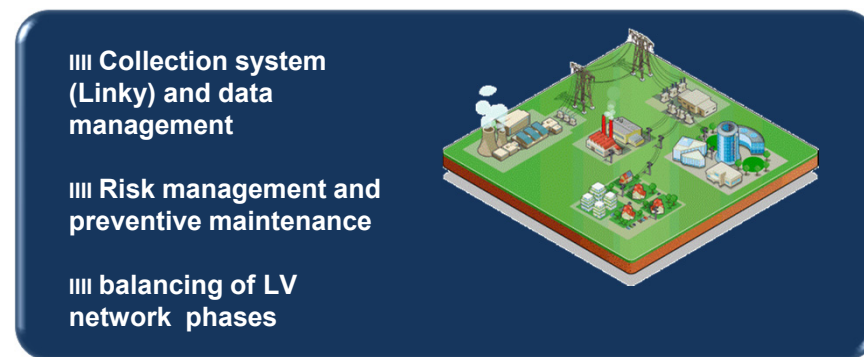
Optimizing
network investment & technical losses

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Defining the benefits for ERDF

3 main domains benefit from Linky

Reduction of non technical losses
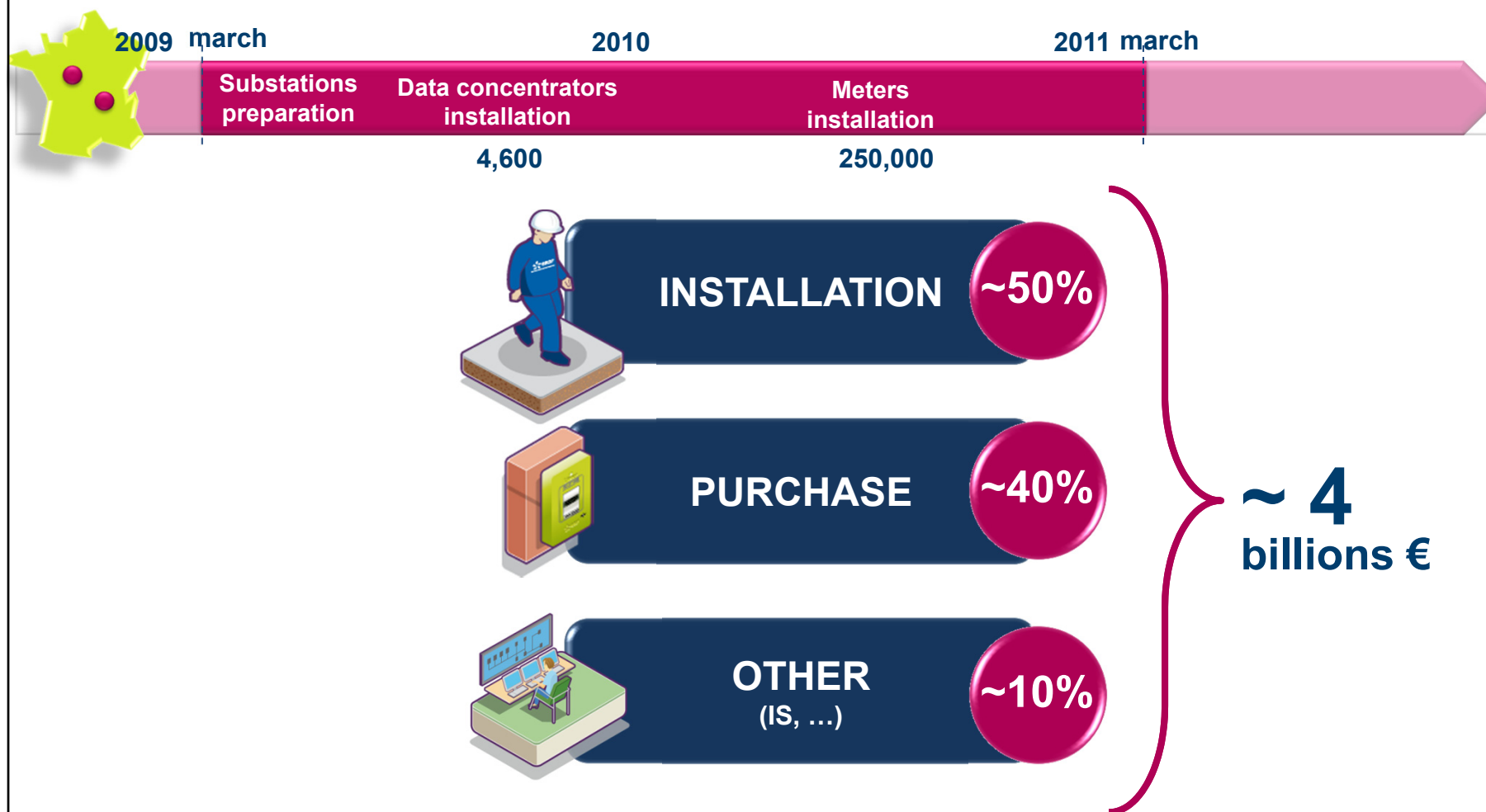**40 to 45%**

Performance of interventions
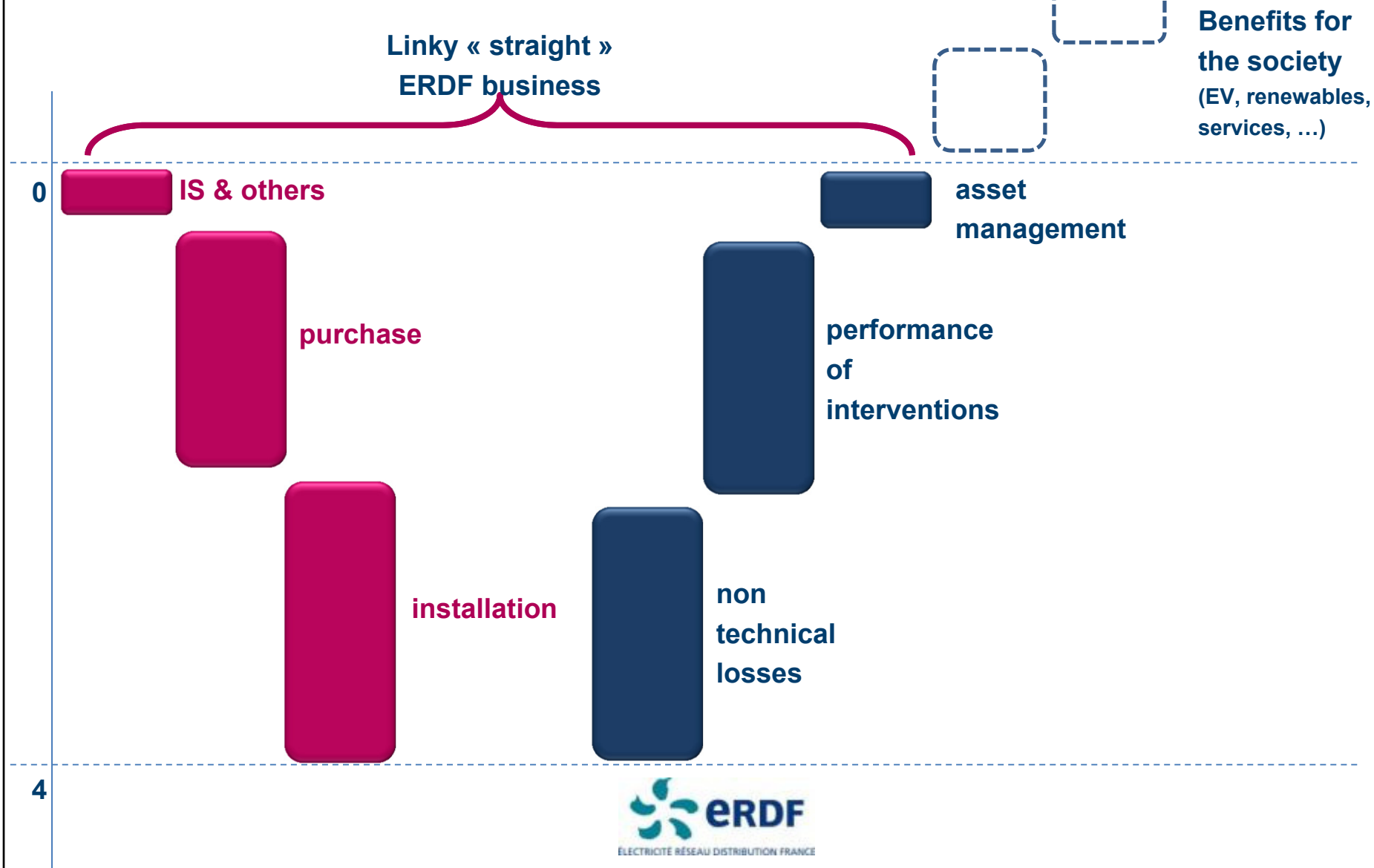**40 to 45%**

Better asset management
15 to 20%

% of each benefit brought by the project

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On the cost side, our pilot project has confirmed pour assumptions

2009 march   **2010**   **2011** march

| Substations preparation | Data concentrators installation | Meters installation |

4,600   250,000

INSTALLATION ~50%

PURCHASE ~40%

OTHER (IS, …) ~10%

~ 4 billions €

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Conclusion : a viable business case

Linky « straight »
ERDF business

Benefits for
the society
(EV, renewables,
services, …)

0   IS & others   asset
                         management

purchase   performance
                      of
                      interventions

installation   non
                      technical
                      losses

4

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Linky architecture

Meters Mass market + C&I	PLC	Data Concentrator + network equipment	WAN	NOC Network Operation Center	Linky Central IS
5 meter types	S-SFK 2400bps	2 DC types	GPRS		
Point to point Meters		Network equipment			
300,000		5,000			Current Pilot target
35M 400,000 C&I		500,000			Generalization target (to be confirmed)

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The main characteristics of the Meters

Meters | PLC | Data Concentrator | WAN | Information System

Linky Central IS
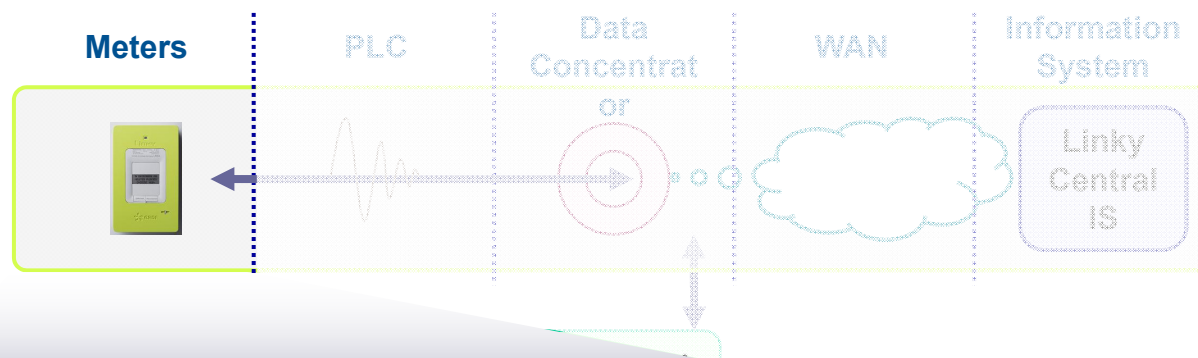
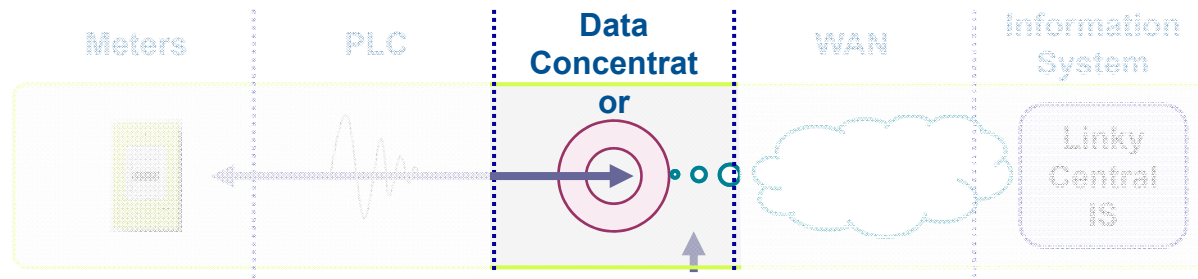- 3 meter suppliers for the Linky pilot
- Open specifications (COSEM)
- Standard Linky functionalities (load curve, breaker…)
- French electric specifications
- 20 years lifetime ; 0,5% annual failure rate

- Local read/write interface via Euridis2 protocol
- Cable output to provide metering data to an in-home display/device
- Upgradeable firmware
- Capable to initiate the communication to send an alarm
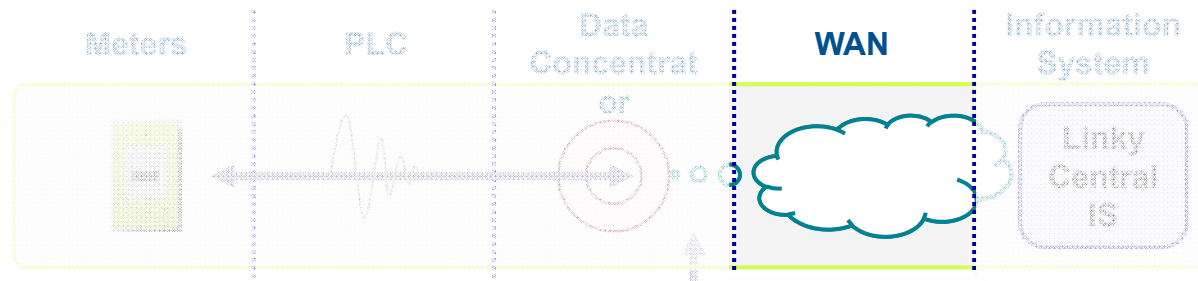
The main characteristics of PLC
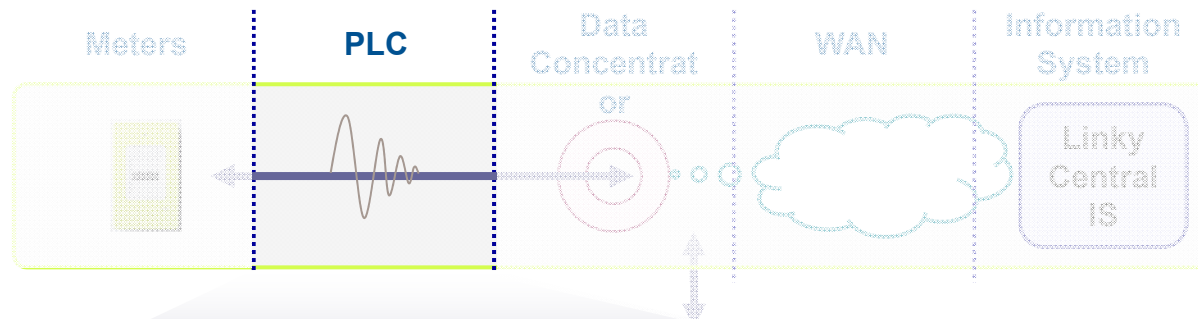
- 1 open protocol

- Cenelec A frequency range

- SFSK modulation

- Based on DLMS/COSEM

- Guarantees interoperability between meters and data concentrators from different suppliers

- Bandwidth of 2400 bps

- Data volume optimization

The main characteristics of the data concentrator

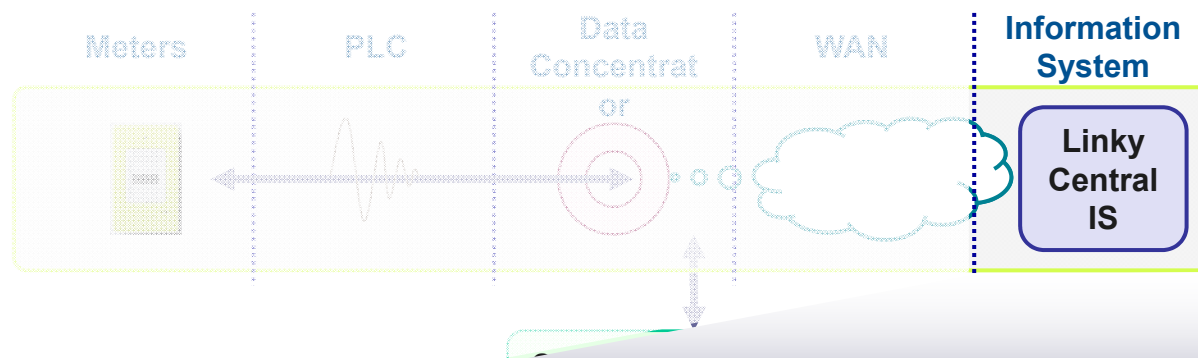| Meters | PLC | **Data Concentrator** | WAN | Information System |

- 2 data concentrator suppliers for the Linky pilot
- Open specifications
- 20 years lifetime ; 1% annual failure rate
- A unique operating system (OS), a unique software
- Local I/O to connect with network equipments, heading to Smart Grid
- Upgradeable software

The characteristics Wide Area Network (WAN)

Meters | PLC | Data Concentrat or | **WAN** | Information System — Linky Central IS

- **Mainly GPRS**

- **Evolutive to support other technologies (BPL, 3G, Wimax…)**

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The main characteristics of the central Information System (IS)

Meters	PLC	Data Concentrat or	WAN	**Information System**

Linky Central IS

- Scalable up to 35 Million meters
- Based on existing softwares
- Evolutive to manage C&I meters

- Metering Asset Management
- Monitoring tools for the entire system (meter – PLC – Data concentrator – WAN – IS)

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