LABORELEC

From innovation to operational assistance

IEA seminar

SMART Metering

Responsibilities in the unbundled Electricity market.

10/10/2007

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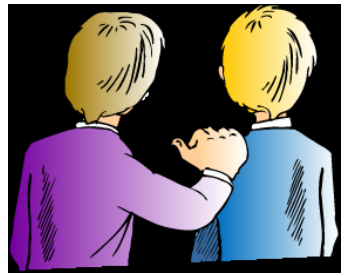
Introduction



From bill data collection to energy efficiency support

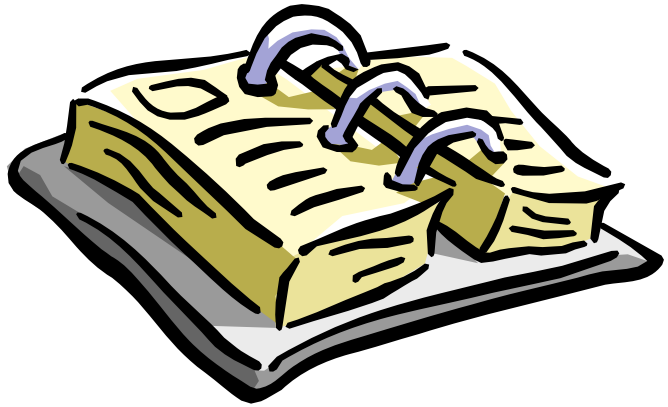
Rationale

- Technology can do it
- Cost reduction by merging functions

Scope = residential customers

Society challenge ⇔ Business model

Smart Meter responsibilities



- **The business model**
- Drivers for smart metering
- Interfaces
- Experience in Europe
- Conclusion - next steps

The basic metering business model

DNO

DNO or metering company (third party)

Suppliers (liberalized)

Who will facilitate energy efficiency ?

The DNO's mission:

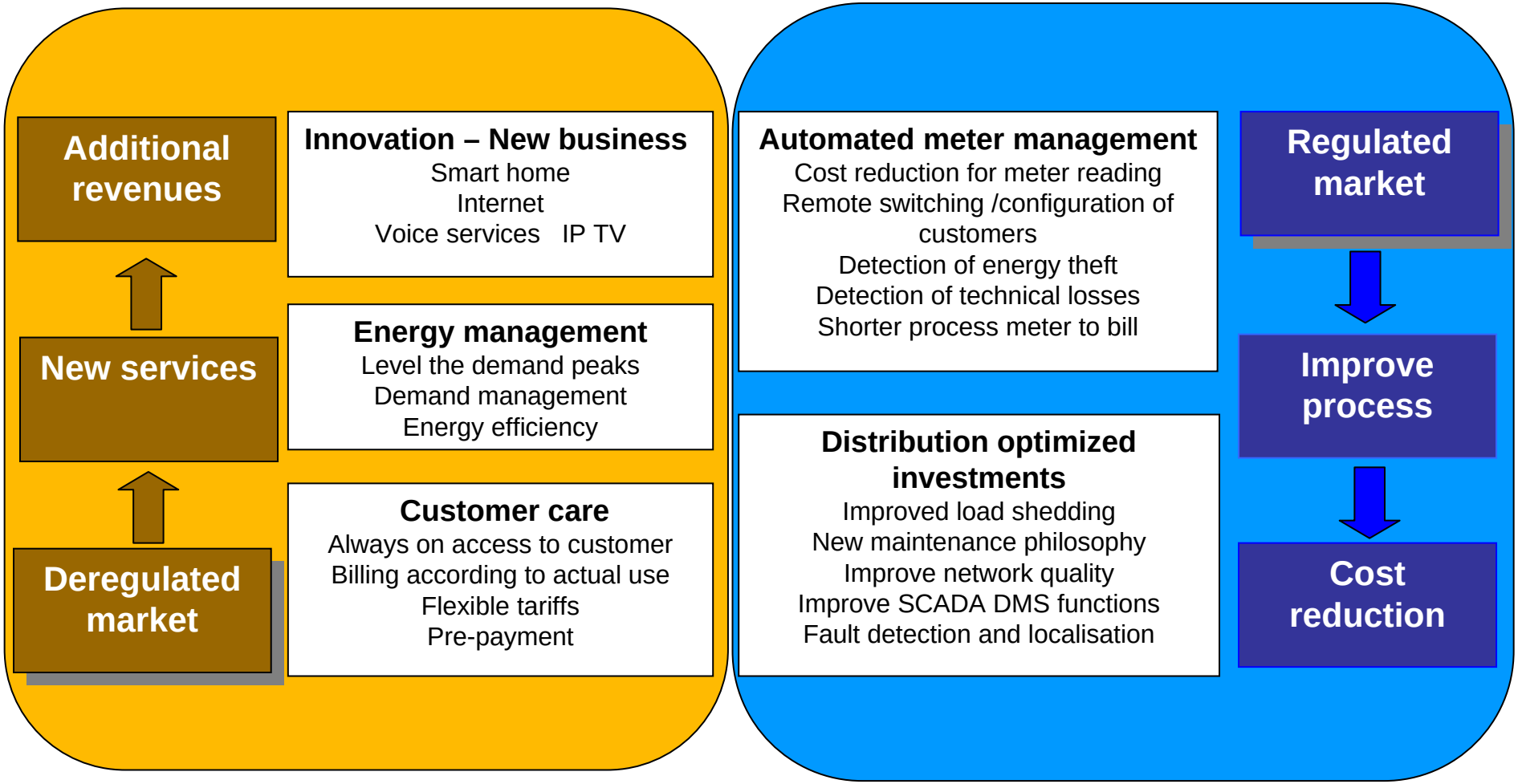
Develop, maintain, operate, give access to the distribution grid.

Energy efficiency in the customer premises is (generally) beyond the scope of network operation.

Smart meters ⇔ energy efficiency :

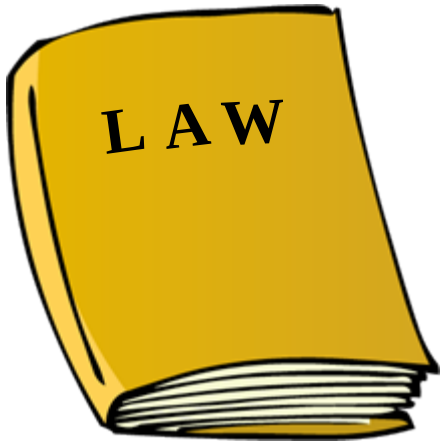
= Tools provided by the DNO's

= Tools to be used by commercial (liberalized) actors


Additional revenues
New services
Deregulated market
Innovation – New business
Smart home
Internet
Voice services IP TV
Energy management
Level the demand peaks
Demand management
Energy efficiency
Customer care
Always on access to customer
Billing according to actual use
Flexible tariffs
Pre-payment
Automated meter management
Cost reduction for meter reading
Remote switching /configuration of customers
Detection of energy theft
Detection of technical losses
Shorter process meter to bill
Distribution optimized investments
Improved load shedding
New maintenance philosophy
Improve network quality
Improve SCADA DMS functions
Fault detection and localisation
Regulated market
Improve process
Cost reduction

The drivers for Smart Metering

- Cost reductions (?)
  depends on the rules of the game !
- Technology ⇔ Antiquated metering infrastructure
- Distribution grid management and operation



- Regulation
- Energy efficiency directive §13
- Energy management
- Facilitation of market functioning
- Smart grid component
- Power quality monitoring

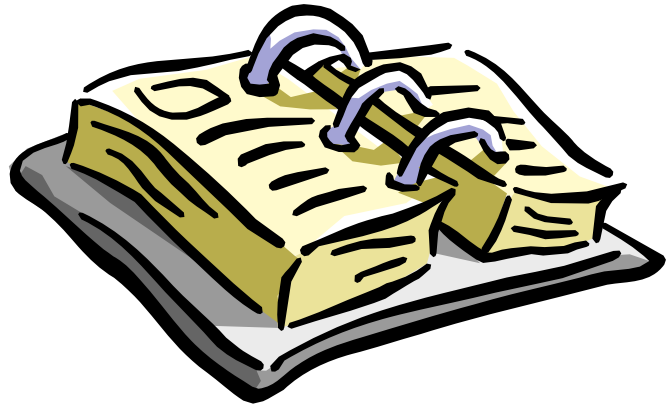
Costs

AMM costs are strongly influenced by

- The customer density and network structure of distribution company
- Good organizing of metering processes
- Rate of readings annually – (e.g. obligation to read every month)
- Additional features such as DSM , Power Quality monitoring and network monitoring

Typical life cycle cost: **200 € / meter**

Smart Meter responsibilities



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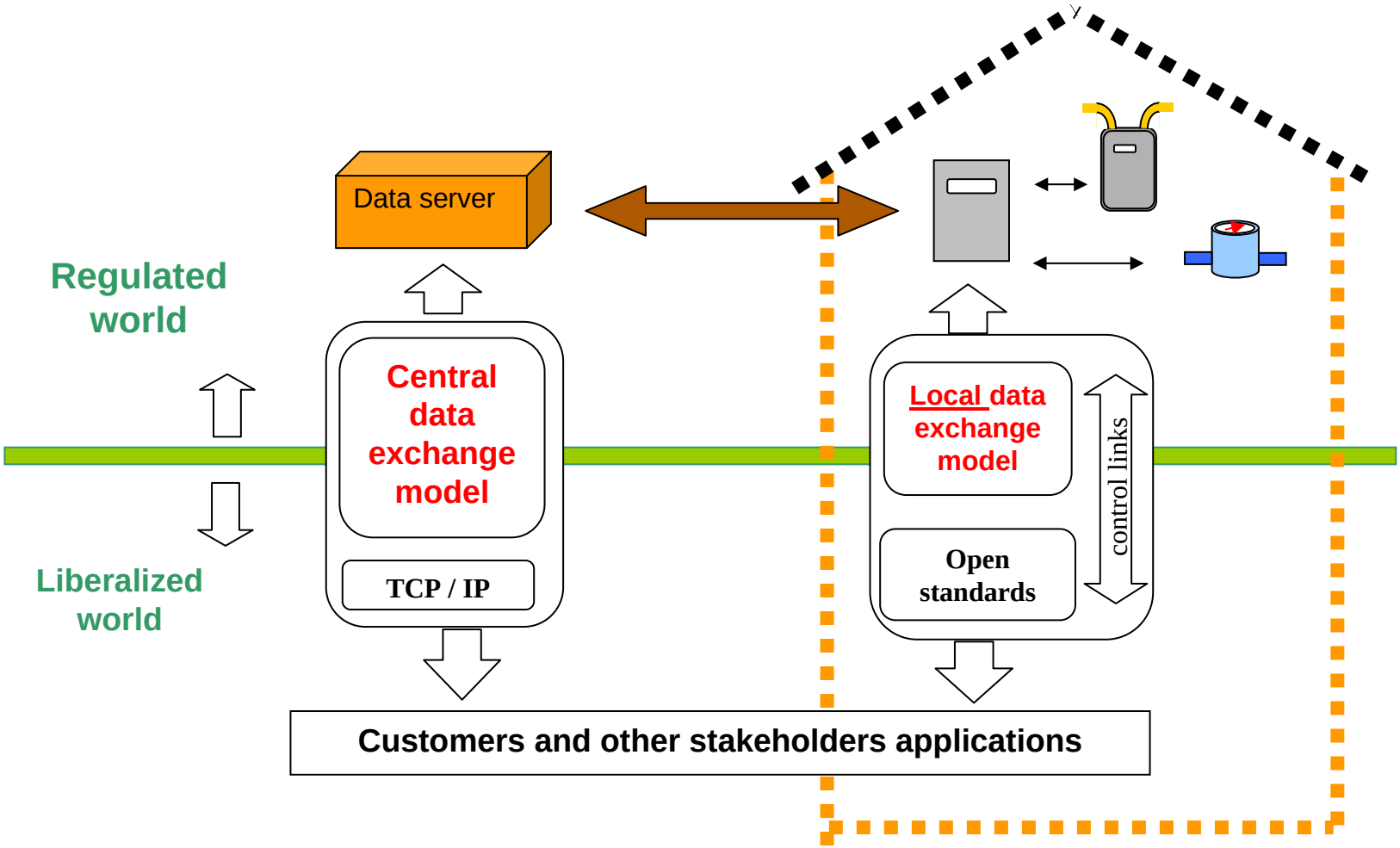
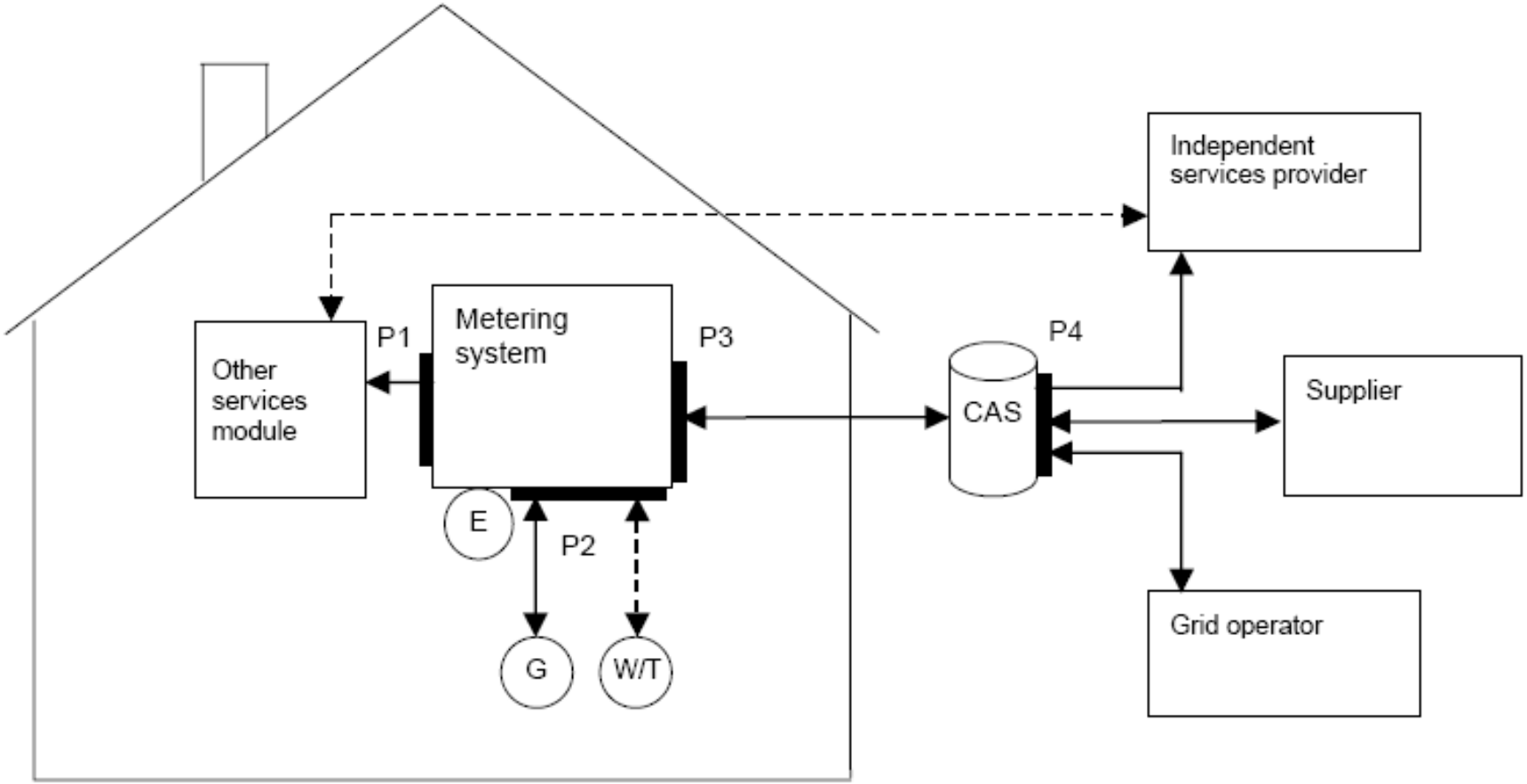
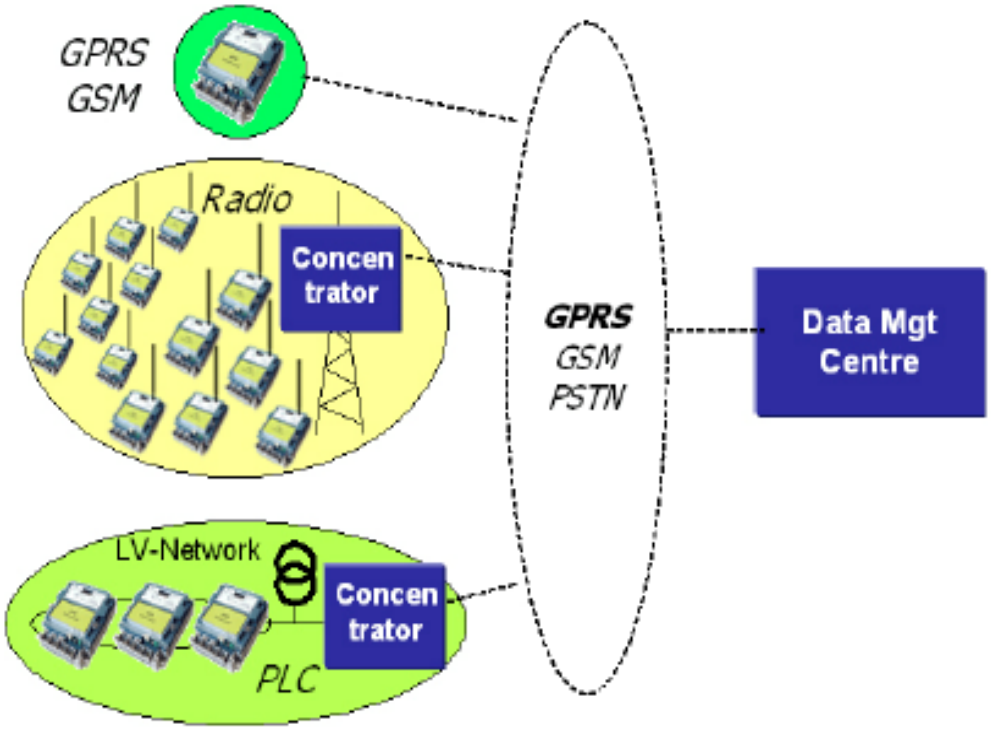
Data exchange

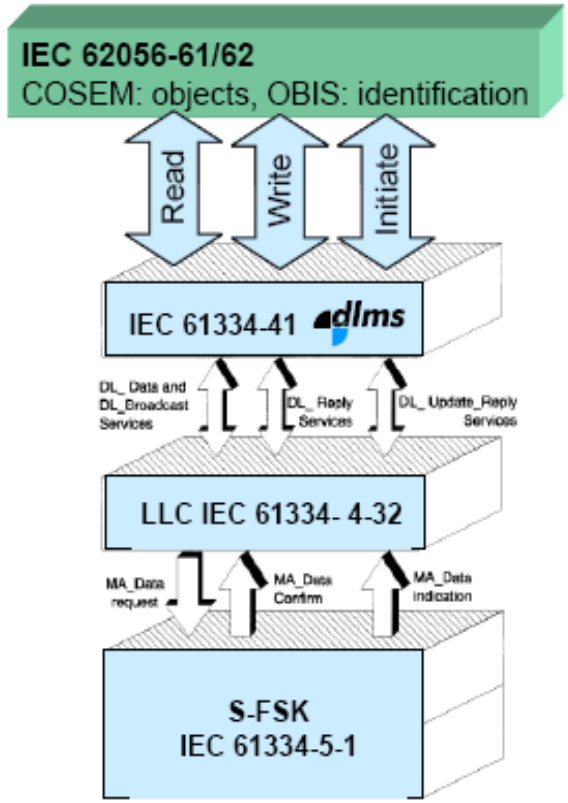


NL Technical agreement



Interoperability = open standards





The meter as communication platform?

Power Line Communication

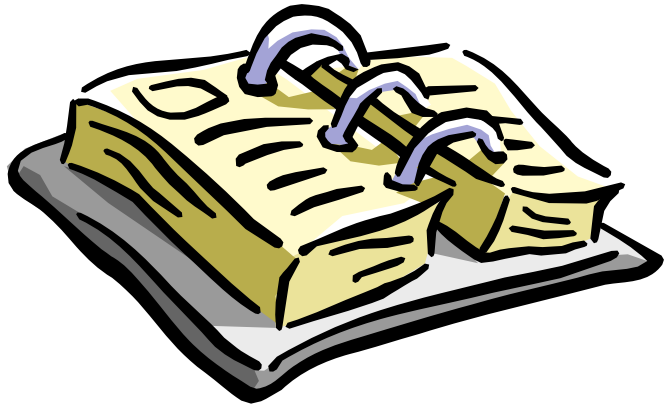
PLC solves the last mile problem
PLC is economically attractive for high densities and mass roll-out

Physical channel: CENELEC band A 9 – 95 kHz
poor signal / noise ratio => 2kbs
sometimes fading out
short range => repeaters

is ok for daily reading, but

not at all comparable with today's media !

Smart Meter responsibilities



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- **Experience in Europe**
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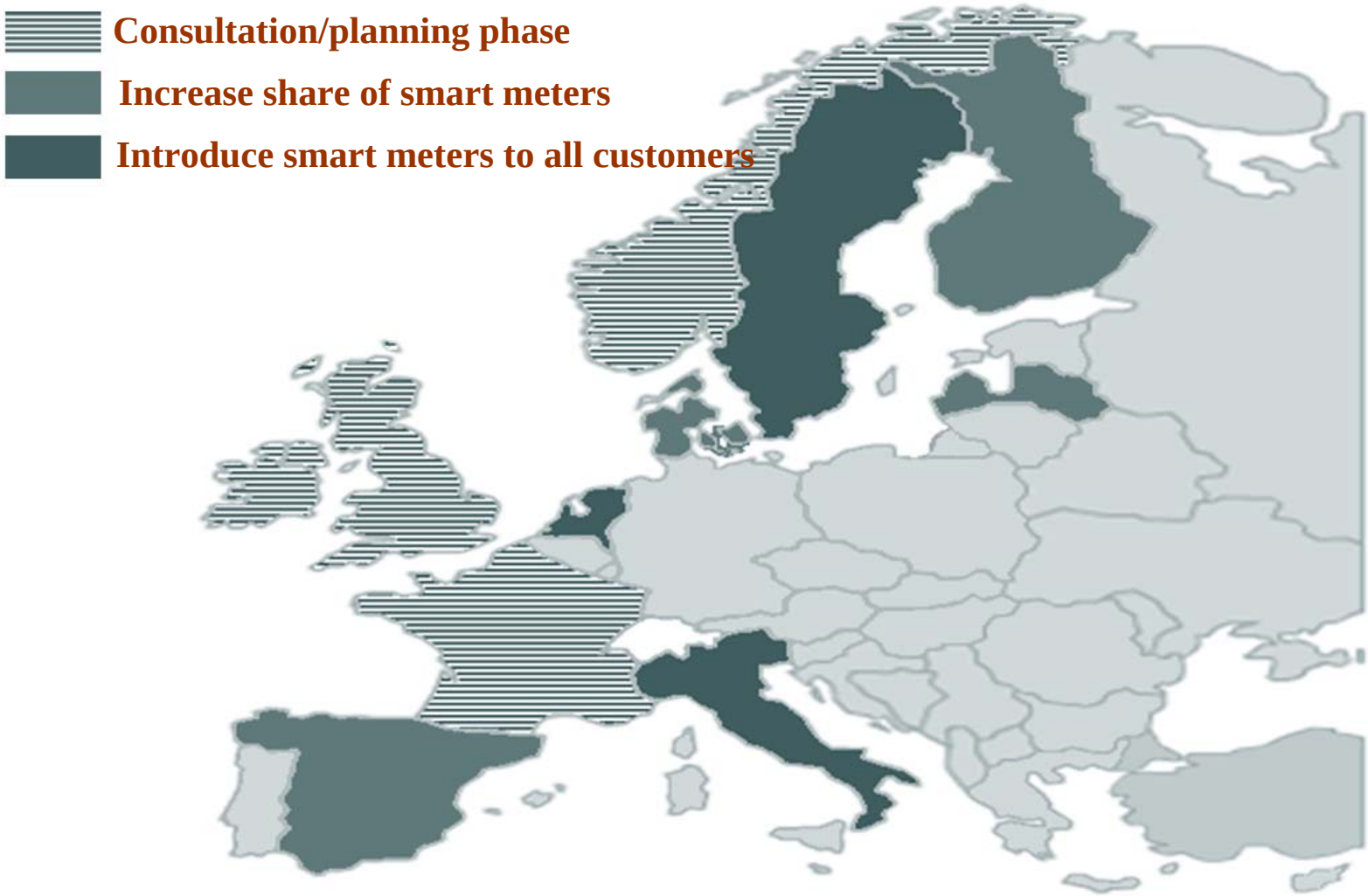
Situation in Europe



The situation in Europe

Norway

- Mandatory hourly metering for customers > 0.1 GWh (2005)
- Voluntarily installations at app. 10 DSOs

Denmark ~ Norway

Finland

- Mandatory hourly metering when main fuses of over 3 x 63 A
- Voluntarily installations

Sweden

- Mandatory hourly metering with one 63A fuse (2006)
- From 01.07.09 all metering points should be read monthly and the Final customers should be invoiced based on their real consumption.

Austria

- Public consultation running
  - Regulator in favour of AMR
  - In depth position paper and detailed cost analysis to come
  - Data access must be guaranteed

Netherlands

- Smart meters for every dwelling within 3 years

UK

- Initiatives for testing the benefits for energy efficiency

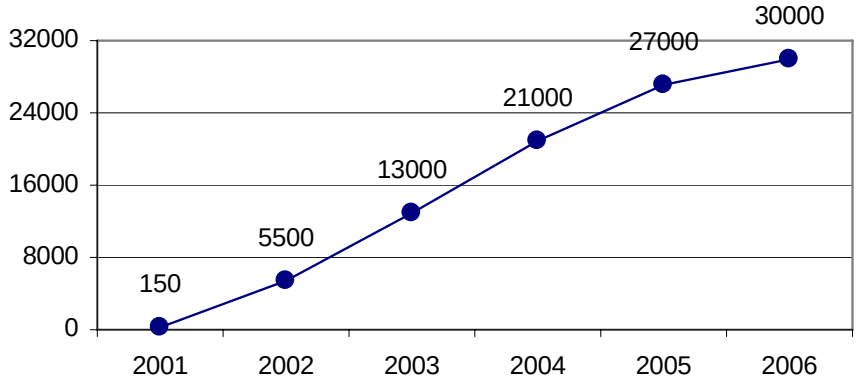
France

- The regulator has published his views on advanced metering (sept 2007).

Italy

- Decree in 2006
- Obligatory installation level at end of 2008 :25% and at end of 2011 : 95%
- Incentive for AMM supported power quality monitoring (from 2008)
- Issues under discussion:
  - Data access
  - Performance requirements
  - Interoperability (e.g. for demand management)
  - Extension to gas

Examples in Europe

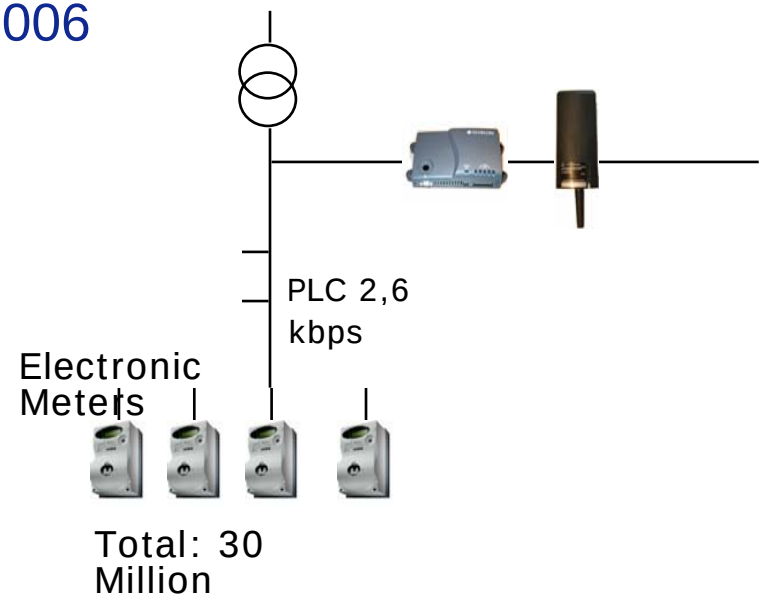


ENEL

- Kick-off in October 1999
- 30 million meters installed in 2006
- 70 € / meter

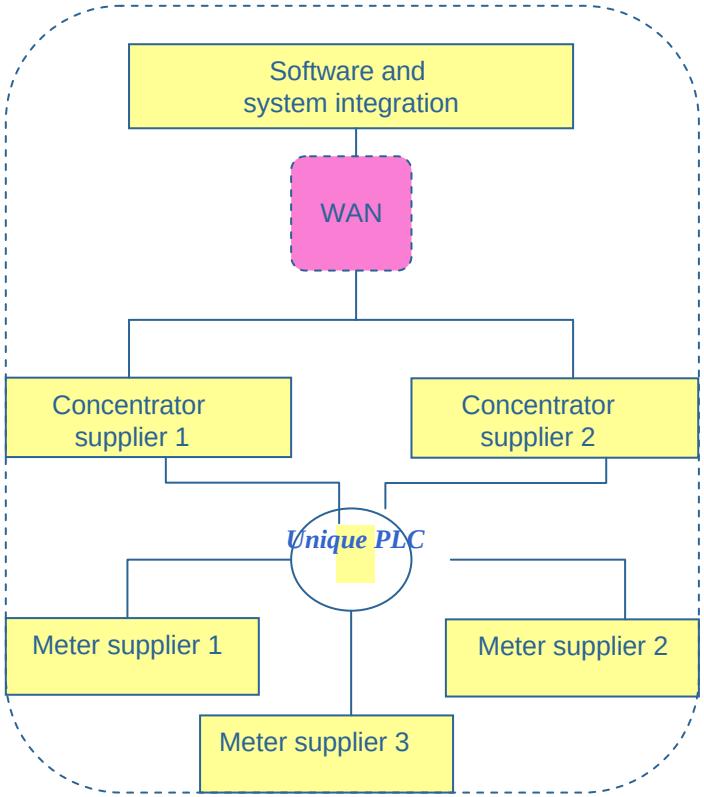
New development

- Bidirectional single phase meters (for µDG)
- Massive GPRS communication introduction
- Multi metering (gas, water, heating, etc.)
- Customer VAS (Value Added Services) & Home Display



EDF France - 35 million meters

Starts with Pilot of 300 000 residential meters
- end of deployment in 2010 -



Focus on

- PLC technology
- Inter-operability
- Economical optimisation

About the local interface

Netherlands NTA 8310:

Every 10s : indexes (registers), actual power, status, and short messages (<1024 char.) - **unidirectional** -

France – CRE

Every ~1s : indexes (registers), actual power, status, tariff info, pieces of load curve, voltage deviations - **unidirectional** -

Locally, the meter is “streaming” out essential data.

Situation in Europe – lessons learned

Quoting the Austrian regulator :

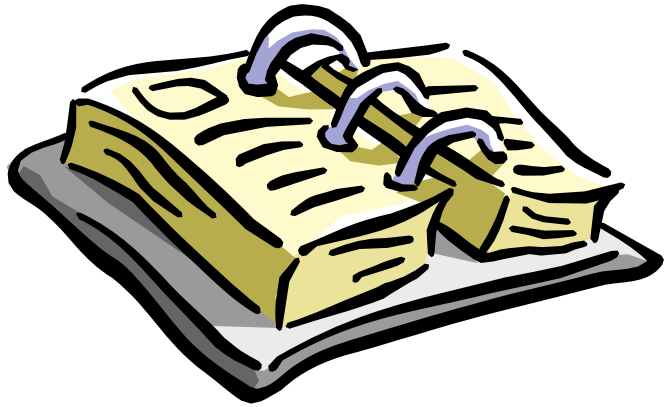
- High expectations but practical experience limited
- Regulated metering prevails over liberalized meter services
- Experience in frontrunner countries such as Italy, Sweden or the Netherlands shows that appropriate regulation is a prerequisite to initiate a large scale smart meter roll-out.
- Smart regulation
  - Metering model and organisation is key to successful smart meter introduction
  - Data access for third parties must be guaranteed (central registry)
  - Meter access (price signals, tariffs, power reduction/disconnection) needs to be organised

The risks for the DNO's

- Problems with communication services
- Risks associated with soft- and hardware vendors

- **Stranded costs if investments do not fulfil the external requirements for at least 15 years**

Smart Meter responsibilities



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Conclusion

- The Smart meter is a **data server**
- For the user,
  - the bulk of the data is to be accessed by Internet
  - the real time data requires a local interface
- Agreement on the information exchange through the local interface is necessary.

Five reasons for you to choose Laborelec :

- You have one-stop shopping for your energy needs
- You get access to more than 40 years of experience
- You get rapid service with reliable solutions
- You increase the profitability of your installations
- You benefit from independent and confidential advice

LABORELEC

The technical Competence Center
in energy processes and energy use.
From innovation to operational assistance.