

Successfully operating smart metering

Lessons learnt from the Nordics

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Bratislava, September 29, 2011

eFOCUS

The Scandinavian market

Characteristics of the Scandinavian Market

- 100 % open market
- Legal unbundling of transmission and distribution
- The wholesale market is fully open
- Trading takes part on a common spot market, Nord Pool (not Finland)
- Regulators continuously try to increase the competitiveness, for example by making it easy for retailers to enter the markets and aligning balancing process between the countries

Smart Metering Regulation

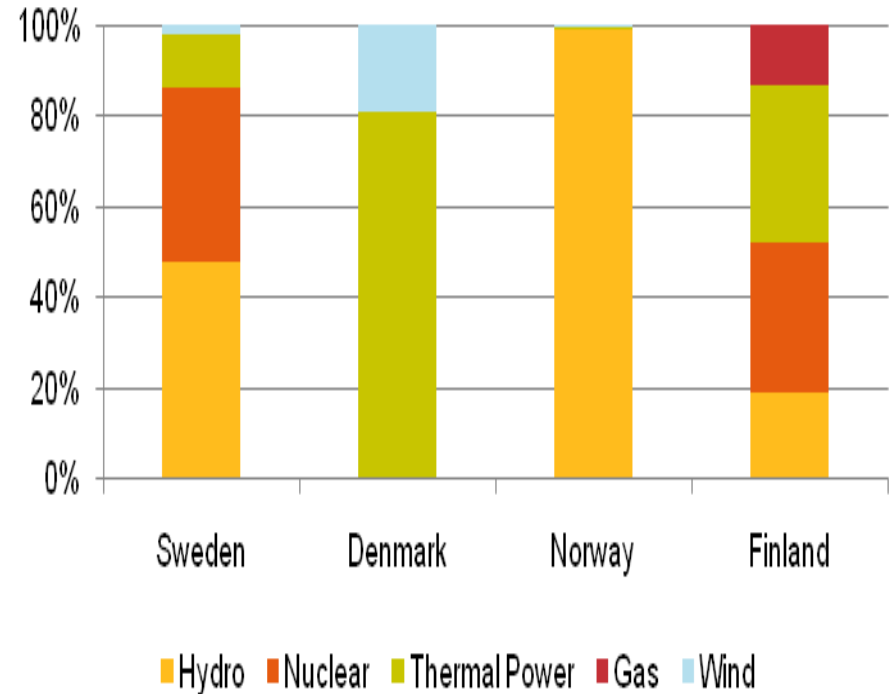
Sweden

- Customers >63 ampere are measured remotely and hourly; all other meters are read monthly (and remotely)

Norway / Finland / Sweden

- C&I customers (consumption >100.000 kWh) are measured remotely and hourly
- The DNO is free to choose how it collects meter readings from other customers

Energy Source (% of Total Production)



Source: NVE, Enrginet.dk, Energimarknadsinspektionen, Oxera Consulting: Energy market competition in the EU (2006)



Many countries — including the Scandinavian region — have committed to reducing carbon emissions by 2020

Sweden

Smart Metering Plans

- Smart metering mass deployment 100% complete
- Plans to introduce hourly reads by 2015

Energy Vision (2020)

- 50 % renewable generation
- 10 % renewable energy sources in transport sector
- Reduce energy consumption by 20%
- Reduce carbon emissions by 40 %

Norway

- All meters should be read hourly and remotely by 2014/2017

- Double use of bioenergy
- Reduce carbon emissions by 47%
- Be carbon neutral by 2030

Finland

- 80 % of end users' meters should be read remotely and hourly by the end of 2013

- Halting and reversing growth in energy consumption
- Reduce carbon emissions by 16% from 2005 level
- Share of renewable energy to rise to 38%

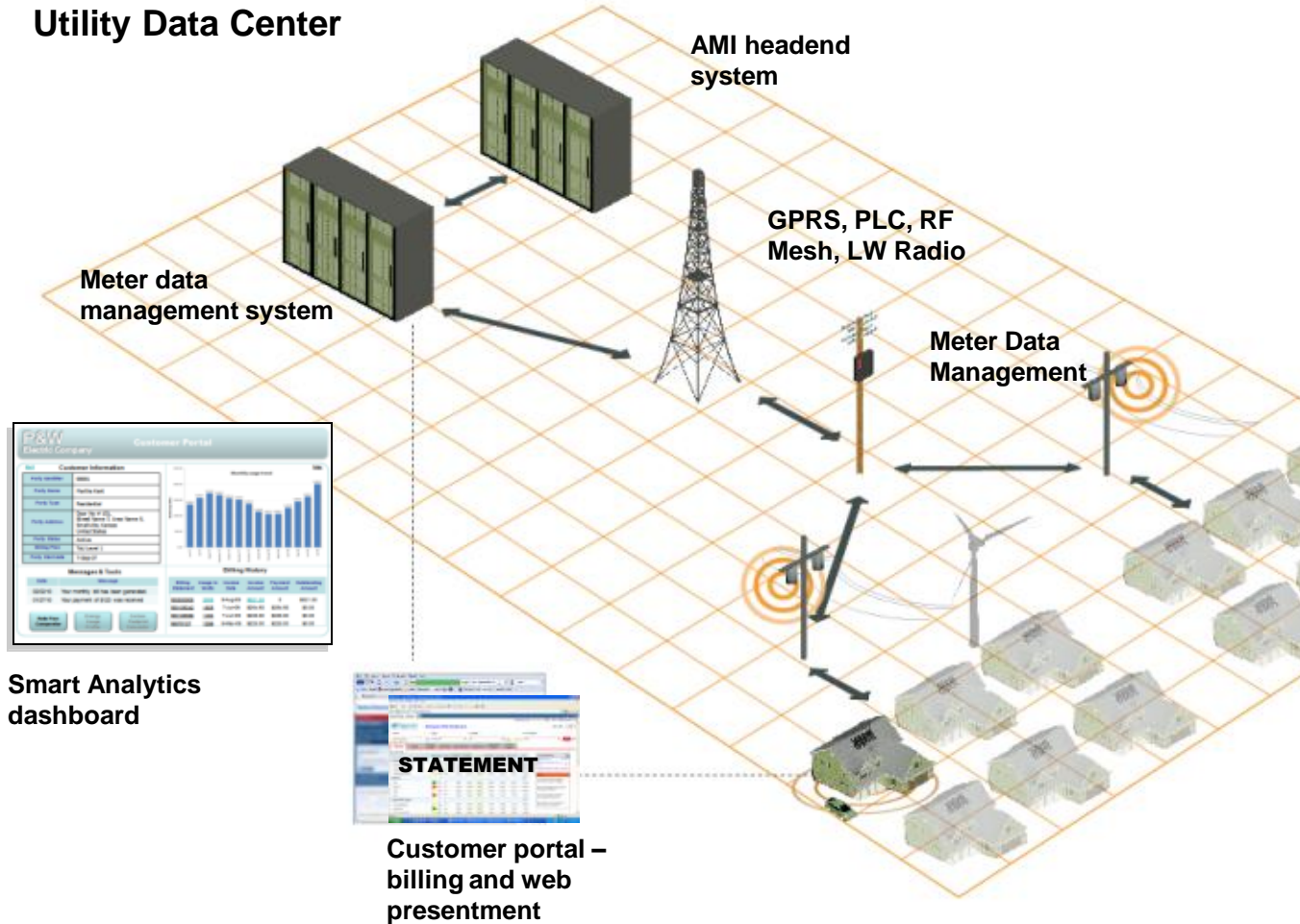
Denmark

- No plans for introducing smart metering for residential customers

- Reduce use of fossil fuels in the energy sector by 33%
- Increase the use of renewable energy to 33 %
- Reduce energy consumption by 6%



Smart Metering delivers a number of benefits and enables Smart Grid



Consumer Benefits

- Accurate real-time information and comparison to other households raises customer awareness
- Accurate bills

Utility Benefits

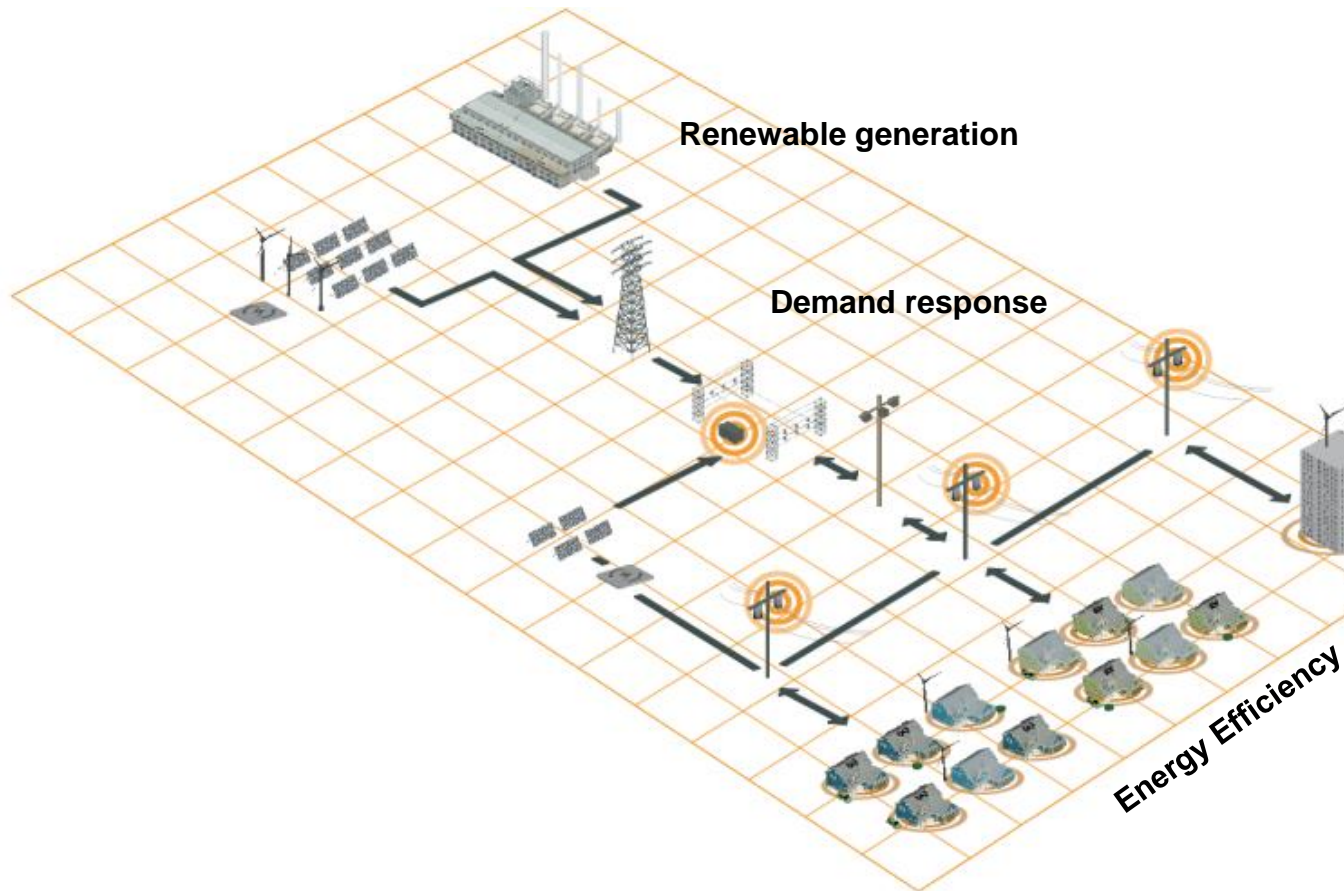
- Reduced operational costs for meter reading and maintenance
- Grid monitoring and control processes improve reliability, power quality and security
- Accurate bills/reduced debt profile

State Benefits

- More accurate base data improves analytics and forecasting and thus supports macro-economic policy



Smart Grid enables operational efficiency and distributed generation, thus reducing carbon emissions



Consumer Benefits

- Maximises benefits from micro generation and flexible tariffs
- Improved reliability of supply and outage management

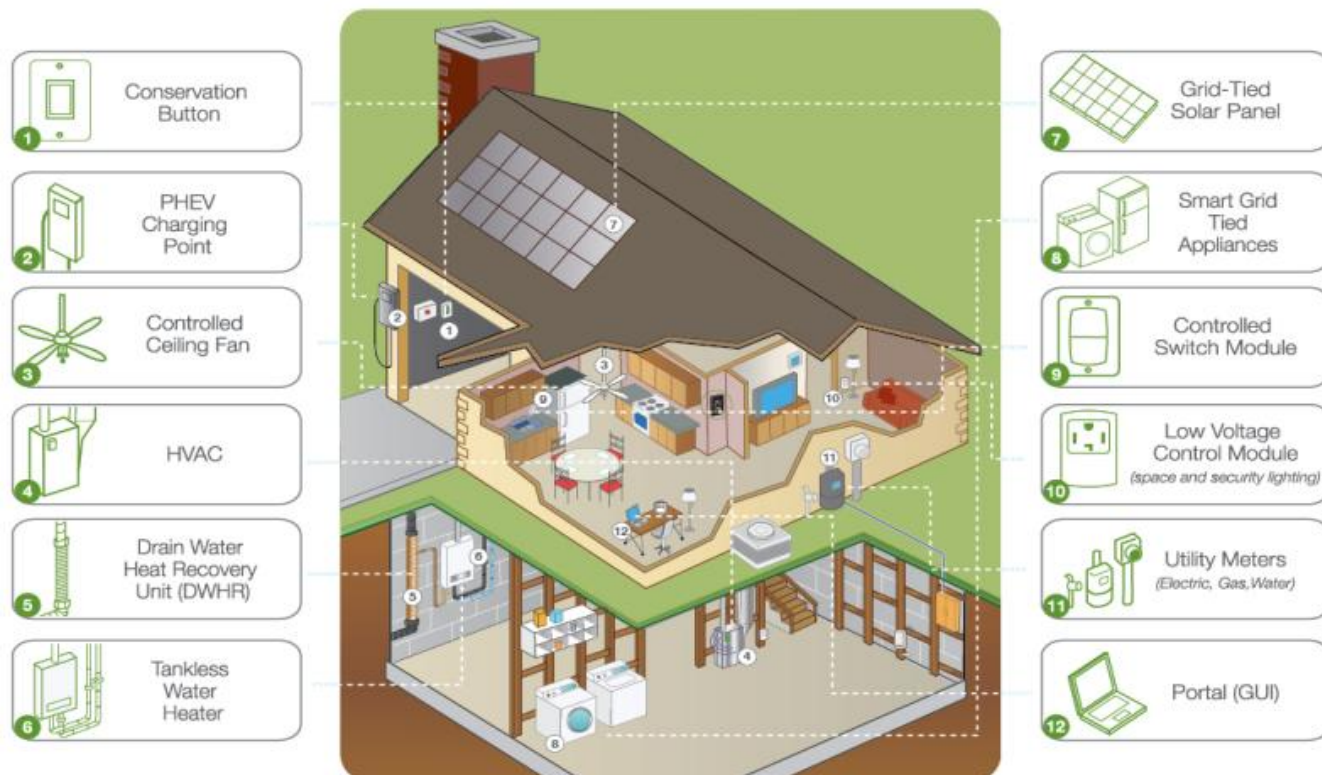
Utility Benefits

- Asset optimisation with two-way communications and advanced applications management
- Improved reliability with enhanced situational awareness and outage management services

State Benefits

- Energy efficiency and CO2 reduction with line-loss reduction and overall reduction in energy consumption
- Smooth peak demand/load
- Better demand forecasting

Smart Home gives customers the ability to monitor and control energy usage



Consumer Benefits

- Flexible, efficient, and cost-effective utility demand response programs
- Automation of customer preferences enables long-term reduction of energy consumption

Utility Benefits

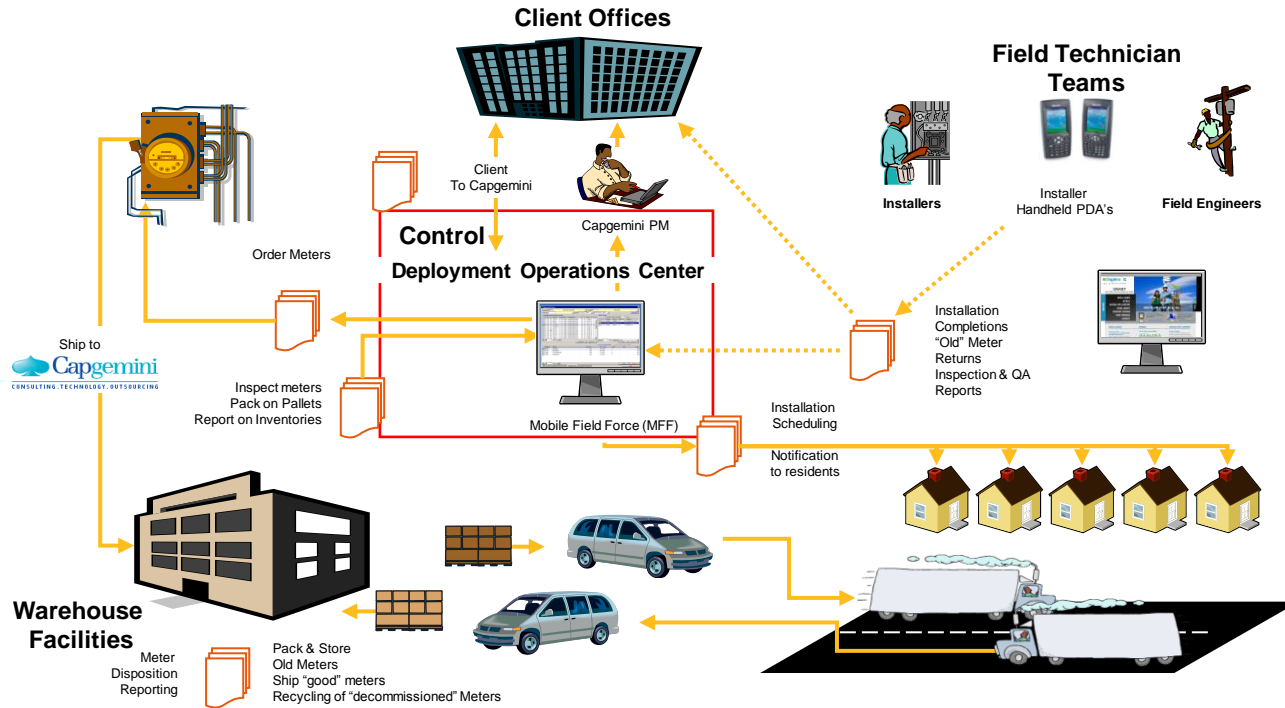
- Distributed and alternative generation management and dispatching programs

State Benefits

- Long-term change in behaviour reduces carbon emissions
- Enables behavioural change in other areas (using IHD as communication channel)



Deploying smart meters and operating them efficiently and effectively to exacting SLAs is not simple

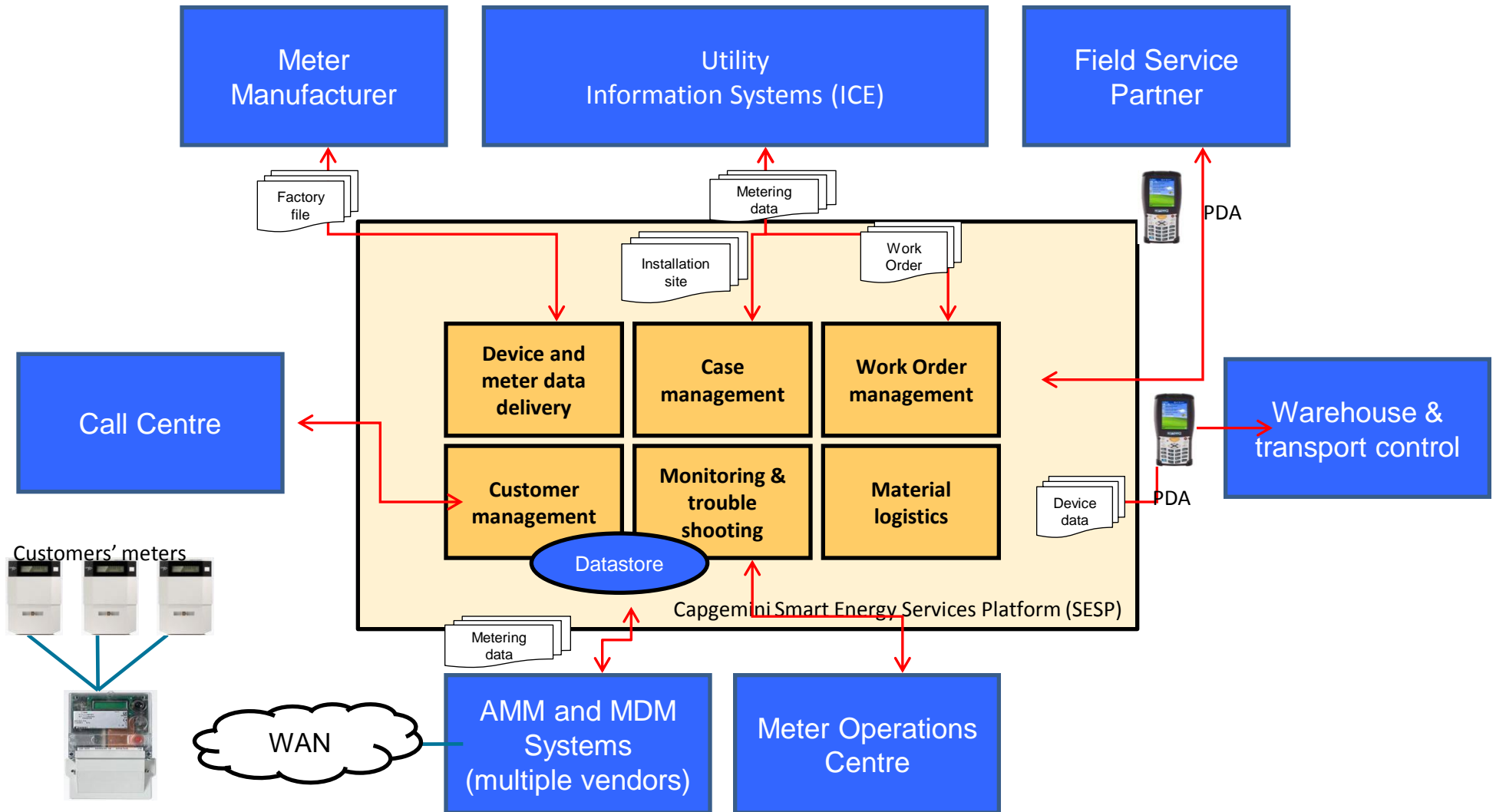


The Issue

- A complex combination of interconnected business processes and technologies
- The technology challenges "at volume" are significant
- The current lack of standards means there is a plethora of choice, between technologies that are evolving quickly
- This is a changing business paradigm
- Poor handling of the customer experience will result in increased levels of churn
- Smart meters are fundamentally different from dumb meters
- Data quality is key – Utility back office systems are not yet set up to deal with this inflow of data



A robust platform is required to support mass deployment



Key lessons learned from the Nordic experience of Rolling out Smart Technologies

Supported
by SESP?

Document the lessons learned from the Pilot



Project set up demands engagement from all parties not only from the Supplier.



The project must include the 'to be' operation organization, in sourced or outsourced does not matter.



Training and implementation of routines and instructions for the installers is crucial to minimize extra field visits & avoid cost over-runs



The "Work Order Management System" must support the processes 100 % e.g. for planning, customer contacts, WO assignment and execution of WO etc.



Full control of Materiel and logistics supply chain is crucial to avoid delays/ over-runs due to lack of equipment, lost equipment, etc. For a total control use a system integrated with WOM system.



Integrated systems support the programme as much as possible, avoid manual handling is the target, build in system quality checks as much as possible



"Real time" reporting for follow up limits the risks in the project.



Thank you for your attention

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