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Why we need smart metering and what it'll mean for the UK

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Global Energy Demand

- 2025: 2 billion more people
- 2025: Energy demand will rise by 54%
- US demand to grow by 141,000 MW over next decade, only 57,000 MW resources identified
- UK demand to grow by 3.56 GW over next decade, only 1.4 GW resources identified
- Aging grid infrastructure – time to upgrade!

Key to managing dwindling energy resources
- *SMART GRID*

How do we meet this demand?

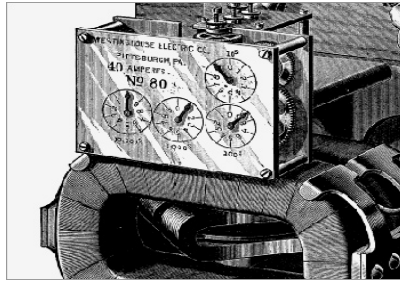
- **Smart grids** – Delivering electricity to consumers utilizing energy distribution networks with dynamic IT features
- **Smart meters** – Collecting, aggregating, managing and transmitting data relating to energy consumption
- **Advanced Metering Infrastructure (AMI)**

Smart Grid & Smart Metering

- Measurement is one of the first steps towards effective energy management, and refining customer behaviors
- Allows visibility for customer to monitor usage and participate in demand response and energy conversion
- AMI provides time-differentiated meter reading which can lower energy consumption by 4%.
- Smart metering will likely reduce domestic energy consumption in UK by 5 to 10%, cut CO2 reduction by 2.5 million tonnes per year

History of Utility Meters

1872-1990
Traditional meters



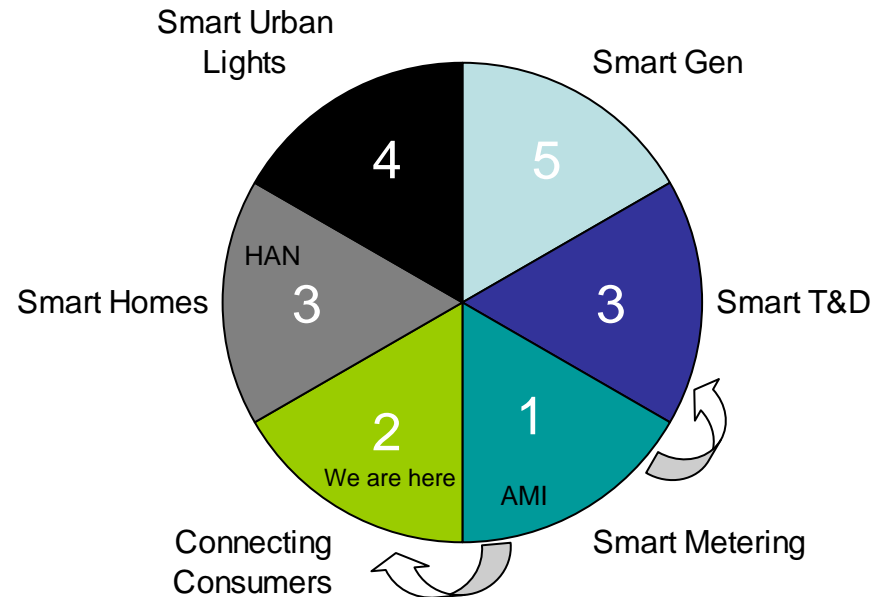
1990-2006
AMR



2007 & beyond
AMI



... and the future



AMR: Automated Meter Reading

AMI: Advanced Metering Infrastructure

T&D: Transmission & Distribution

HAN: Home Area Network

Smart Meters:

Advanced Metering Infrastructure (AMI)

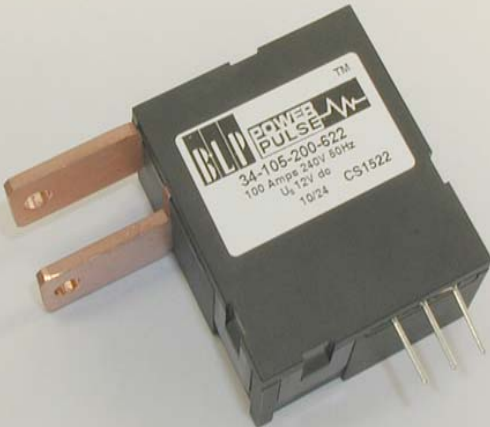
- Remote provision of accurate reads/information for defined time periods
- Utilities can dynamically monitor and price electricity consumption
- Open, 2-way, high bandwidth communication
- Provide real time information to an in-home display and enable other devices to link to the meter system
- Support for a range of time tariffs
- Remote disablement & enablement of supply
- Prepayment
- Metering infrastructure delivers demand response
- Remote OTA (over-the-air) upgrade
- Critical peak pricing
- Load forecasting



No Smart Meters without Disconnects



200A disconnect relay for the US



100/120A disconnect relay for the UK

- Built-in disconnect is an integral part of smart meter
- **Prepayment option**
- **Tariff switching**
- **Load shedding**
- Load limiting
- Power restoration in a safe and cost effective manner
- Traditional reasons (no-pay/slow-pay & move in/out customers)
- Remote disconnect in the events of emergency such as fire (Future)

UK & Smart Metering

- 47 million meters in 26 million UK properties
- UK government (DECC) wants all UK homes to have smart meters installed by the end of 2020
- Mass roll-out to begin in late 2011, early 2012
- £8bn scheme



IEC Smart Meter for UK

Challenges for smart meters in the UK

- No utility competition within US
- Central communications model as the delivery method for smart meters in UK
- Common communications model platform across all UK utilities
- UK power companies have access to the same customers
- WiMax or GPRS technology
- GPRS is expensive
- WiMax can work with existing public networks and provides high data rate at a good cost

Who are the early birds?

- UK Utilities

first:utility

British Gas 

npower

- First Utility rolling out smart meters in the summer 2010
- British Gas creating 2,500 new jobs by installing millions of smart meters in UK homes (300,000 by Dec 2010)
- npower aims to have 100,000 units installed in 2010



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What does smart metering mean for residents?

- Help people dynamically monitor energy consumption and cut energy bills
- Visual displays showing on-demand electricity consumption
- Over 11 million households (43%) owe money due to discrepancies
- Residents generating off-grid energy can measure how much they feedback to the grid for potential credits

What does smart metering mean for energy companies?

- A need to keep market share with companies actively participating
- Managing peak loads
- Enables utilities to dynamically monitor and price electricity consumption
- Critical peak pricing
- Load forecasting
- Faster power restoration (saving)
- Improve billing accuracy, ~30% residents billed wrongly last year
- Meeting CO2 reduction demands
- Improved customer satisfaction

How will smart meters save energy?

- Encourage off-peak energy use
- Provide info on most used appliances and offer energy saving tips
- Link up household appliances – freezers, heating, washing machines

How big is the revolution?

- Widespread of Smart Metering for Smart Grid in North America
- US Federal Stimulus Package: \$3.4B for Smart Grid initiatives
- ENEL (Italian Electricity Utility); mass deployment of Smart Metering
- Program roll-outs in Australia and New Zealand
- Projects in UK, Netherlands, France, Spain & Germany
- Early deployment happening in Taiwan
- Japan, Brazil, China, India, Philippines to follow suit



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Thank you!

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