Environmental *Change* Institute

Communicating 'smartness': smart meter installers in UK homes

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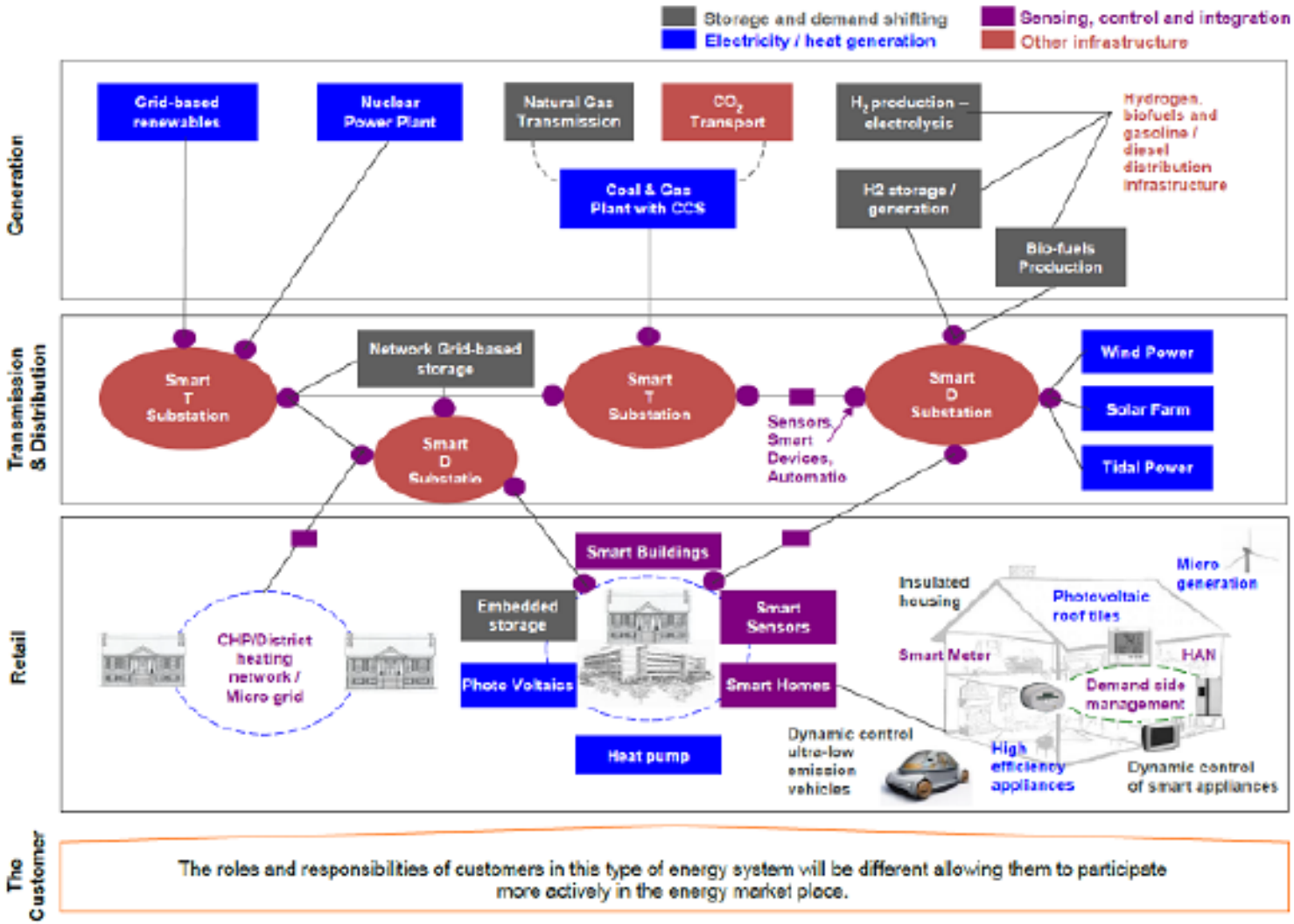
A potential smart system



From Smart Grid Forum, February 2014 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/285417/Smart_Grid_Vision_and_RoutemapFINAL.pdf

The 2012 Energy Efficiency Directive, Article 8: regulation for metering and feedback

1. MS shall ensure that, in so far as it is technically possible, financially reasonable and proportionate in relation to potential energy savings, customers … are provided with … individual meters that accurately reflect … actual energy consumption and that provide information on actual time of use…. when

(a) an existing meter is replaced …

(b) a new connection is made in a new building or a building undergoes major renovations.

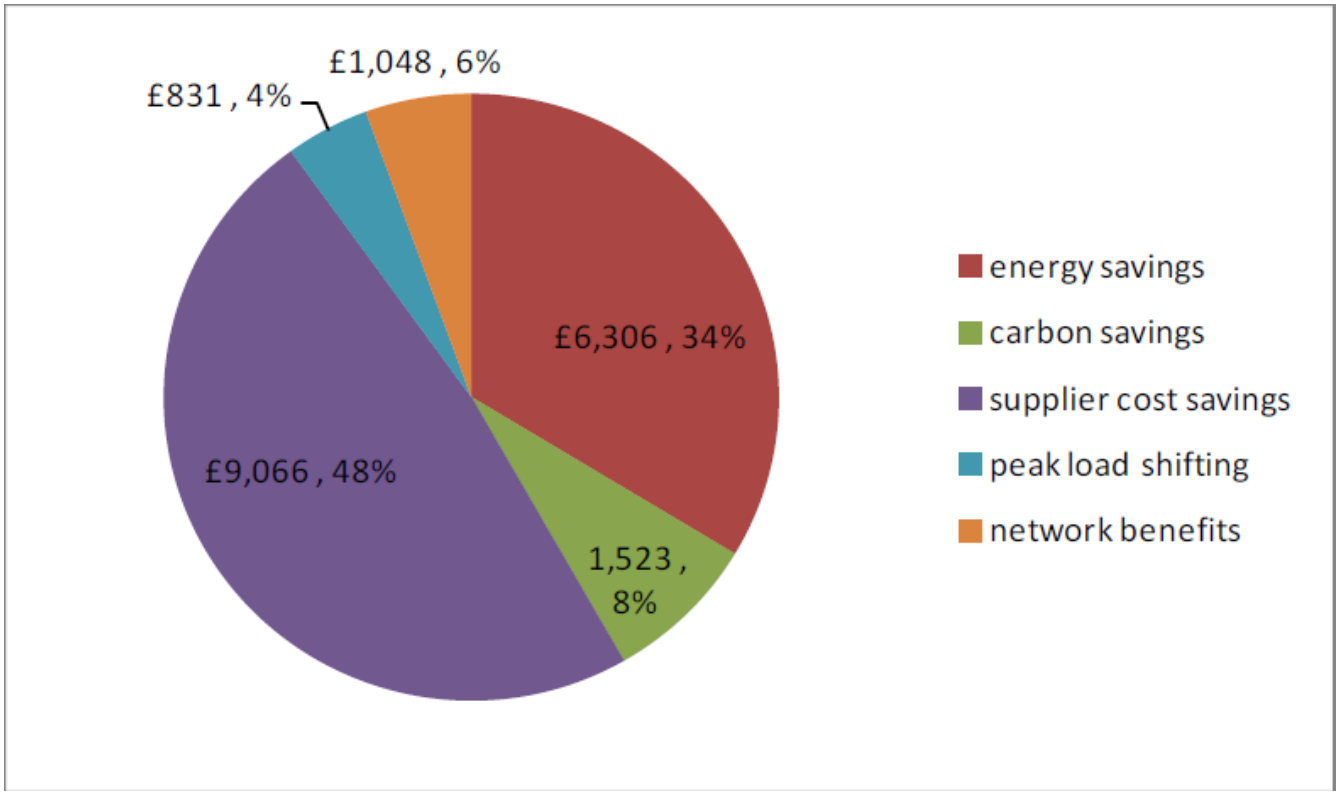
2. (a) … ensure that … the objectives of energy efficiency and benefits for customers are fully taken into account when establishing minimum functionalities of meters and the obligations on market participants;

…

(d) …ensure that if customers request it, metering data on electricity input and off-take is made available to them or to a third party … in an easily understandable format that they can use to compare deals on a like-for-like basis;

(e) they shall require that appropriate advice and information be given to customers at the time of installation of smart meters, in particular about their full potential with regard to meter reading management and the monitoring of energy consumption.

The business case for smart metering in Great Britain: estimated benefits from residential and small business rollout (£000)



(this £6.3bn assumes 2.8% electricity savings; 2% for gas credit and 0.5% for gas prepayment customers. Estimates are based mostly on trials in the UK and Ireland)

DECC Impact assessment, 2013

GB Smart Metering Installation Code of Practice requires all installers to be trained to

- give guidance on electrical safety and carbon monoxide
- offer each customer an in-home display (IHD) and, if accepted, set it up to meet the needs of the household (e.g. with correct tariff and mode of payment)
- demonstrate how to use the smart metering system 'in a clear and accurate manner… easy to understand, including what information is available… how this can be accessed, and use of the IHD … informed by any specific needs'
- advise on additional sources of help and information
- identify vulnerable customers, report back to the supplier

The focus groups

GB - 5 installers + managers

GB – 6 installers + manager

Experience of Foundation Stage smart-type meter installation

NI – 2 installers, 2 managers

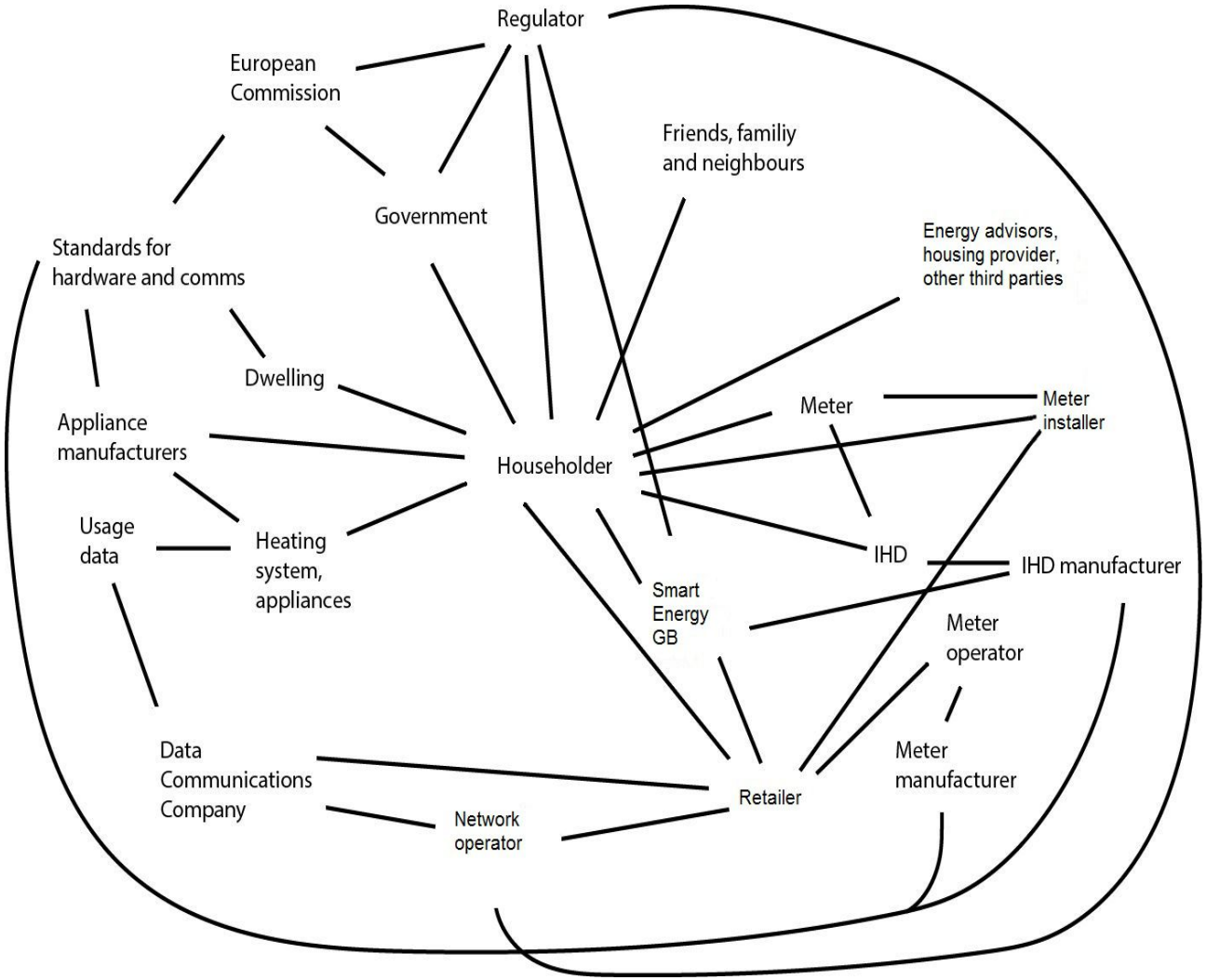
NI – 2 installers + manager

Experience of semi-smart keypad meters since ~2002 + small-scale smart meter trials

Themes from the focus groups

- The nature of installers' work had changed, and they welcomed it
- Installers saw customers in more specific and relational terms than policymakers. They did not classify them by soc-ec / demographic indicators, but by how they interacted / conversed.
- Safety issues the priority, followed by equipment workability.
- Concerns about allowing enough time for proper conversations with customers + contracting out installations to less-trained engineers, once main rollout is under way.
- Training involved engineers and call centre staff. Feedback to the organisation takes place through team meetings + through trained engineers training others.
- IHD was focus for customer interest; installers saw it as a teaching aid. Useful insights on how people react to different IHD functions.
- Customer demand for smart meters growing in the wake of TV advertising and word-of-mouth recommendations.
- Installation is one element in a sequence of learning at many levels.

An (outline) actor-network for smart metering in Great Britain



Thanks to

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The installers.

Paul Wallace of NEA, who advised and assisted.

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The ECEEE reviewers.

Further reading

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/407568/8_Synthesis_FINAL_25feb15.pdf

Some theories encountered during the Smart Metering Early Learning synthesis

Theory of planned behaviour

Affordance theory: smart metering affordances (specification) related to effectiveness

'Scripting' + concepts of user logic and designer logic for technologies/artefacts

Classical microeconomics: energy saving follows financial incentives

Behavioural economics: non-economically-rational nature of many decisions

Experiential learning theory: people experiment with technologies and activities over time

Personal development theory: benefits from combined effects of infrastructure, norms, education, personal experience and technologies

Practice theory: outcomes depend on dynamics between technology, meanings, rules and routines

Social learning, communities of practice, activity theory

Socio-technical systems (STS) theory: feedback is an implicit/explicit property of the system

Large technical systems theory: system is the unit of enquiry; systems evolve in phases.

Multi-level perspectives: transformation: smart meter is niche product within regime and landscape

Actor-network theory: outcomes from relationships between human and non-human actors

Intelligibility as a property of sustainable energy systems

Lovins (1976): 'soft energy' (flexible, resilient, sustainable, benign)

- Relies on renewable energy flows from diverse sources
- Is flexible and relatively low-tech: *easy to understand and use without esoteric skills, accessible*
- Is matched in scale, distribution and energy quality to end-uses

(https://www.foreignaffairs.com/articles/united-states/1976-10-01/energy-strategy-road-not-taken)

From EDRP (GB smart meter and feedback trials) final report (AECOM, 2011)

- 'The variable tariff trial group was difficult to recruit to because customers did not understand the principle of load-shifting and did not believe that the company would want to help them save money. EDF had to provide the recruitment agency with a special training session specifically on this intervention.' p16
- The EDRP trials did not set out to test installation effects but they arise through different approaches to recruitment and installation. The installation procedure, for example, ranged from trying to minimise any impression that the work was anything other than "business as usual" or promoting minimal interaction between installer and householder, to training installers to demonstrate the installed technology to householders. (p129)
- Installers need … additional training to be able to install both gas and el meters and to deal with any unforeseen safety or legacy issues. Softer skills are essential too, so that installers can clearly explain the new technology to customers. Customer advice services will need to build up their knowledge of the new technology to be able to answer consumer enquiries. (p173)

IRISH RESIDENTIAL ELECTRICITY CUSTOMER BEHAVIOUR TRIAL FINDINGS, 2011

4,300 participants, all with smart meters

Trial groups had some combination of

- a time-of-use tariff with supporting information,
- monthly/ bimonthly bills + detailed statements,
- electricity displays

Control group had none of these – just the smart meter.

6 months baseline data; 12 months' trial data

Average *overall* savings 2.5% relative to control group, at end of a year of TOU tariffs and improved feedback

Peak usage reduced by 8.8% on average

Bimonthly bill + display with TOU pricing gave best reductions: overall 3.7% and peak 11.3%

Conclusion: results come from 'a combination of technology, price signal and customer engagement'.