



Smart Grids The Customer Perspective

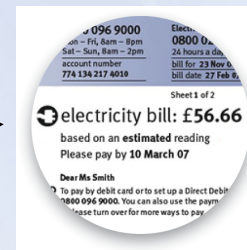
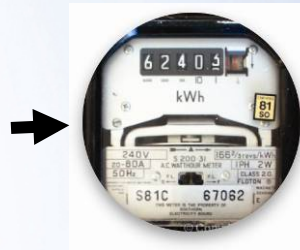
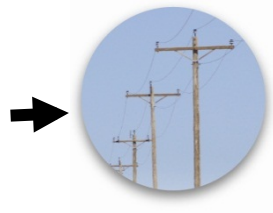
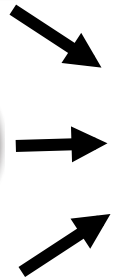
**Prepared by Linda Hull
Operating Agent Task 23
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Delivering Innovation in **Power Engineering**

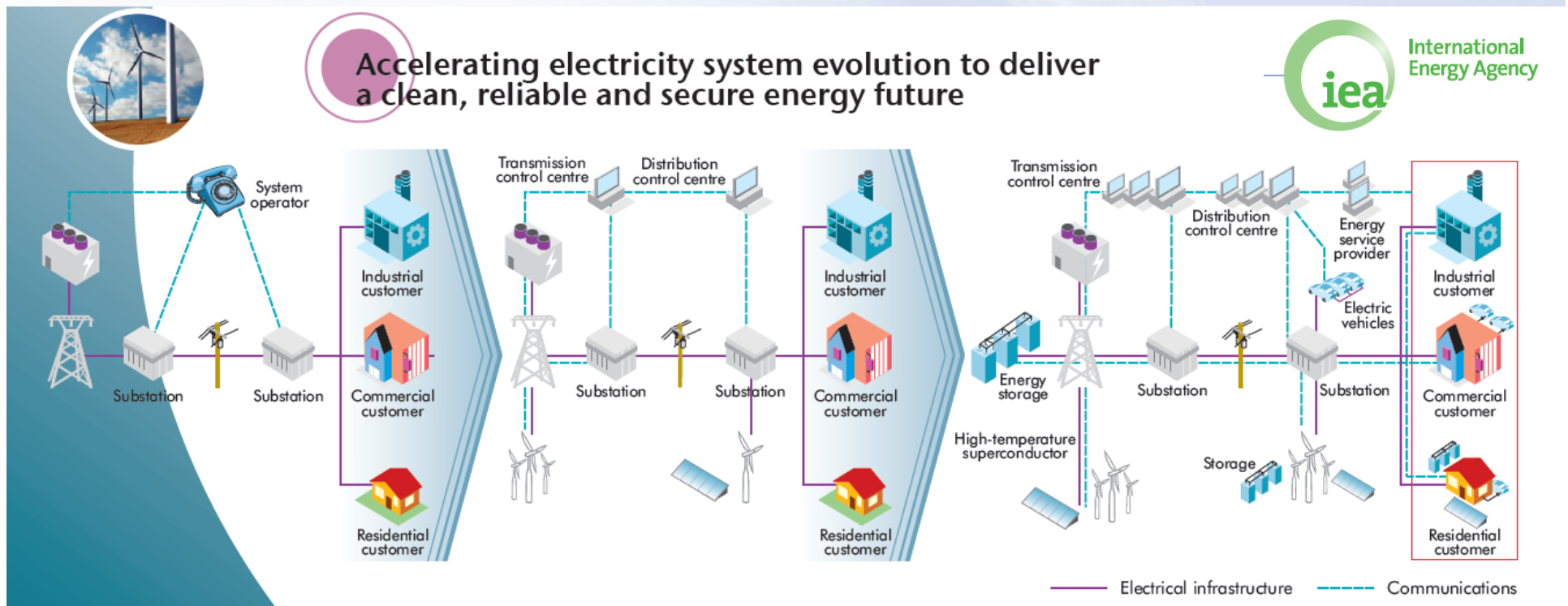
Electricity Networks

- From this



Electricity Networks

- To this



Drivers for change

Reducing CO₂ emissions

- **Direct savings**
 - peak load management
 - reduced losses
 - energy efficiency
- **Enabled savings**
 - integration of renewables
 - facilitation of new technologies (electric vehicles / heat pumps)

Key Actions

(IEA SmartGrid Road Map)

Who	What
Generators	Increase utilisation of variable generation
Transmission / Distribution	Demonstrations / business models
Regulators / Government	Regulatory / market solutions
Technology providers	Technology solutions / standards
Customer Advocates	Engagement / awareness
Environmental Groups	Support of smart grids

IEA DSM Implementing Agreement

- **New Task**
 - **Task 23: The role of the demand side in delivering effective smart grids**



- **When**
 - **Very soon**

- **Who**
 - Confirmed:**
 - **Korea**
 - **Norway**
 - **Sweden**

- Hopefully joining:**
 - **Belgium**
 - **Netherlands**
 - **UK**

Why?

- **Millions of smart meters have been rolled out worldwide**
 - 46 million in 2008
 - Forecast to reach 250 million by 2015(*)
- **Who pays for these meters?**
 - The customers via energy bills
- **What are the benefits to customers?**
 - Or what is the alternative option?
- **Can smart grid benefits be delivered without the support of customers?**

What do smart grids deliver for customers?



Smart meters	Enabling third parties to 'spy' on customers	Providing information to be enable customer to better understand and manage their consumption
Time of Use Pricing	Need to pay more for electricity at time of peak demand	Provides opportunity to reduce overall electricity costs
Direct load control	No longer able to use appliances 'on demand'	Automatic processes to optimise use of home appliances
Smart appliances	Heating / air-conditioning that turns off when you don't want it to	Heating / cooling system that costs less to run without any discernible effect on comfort

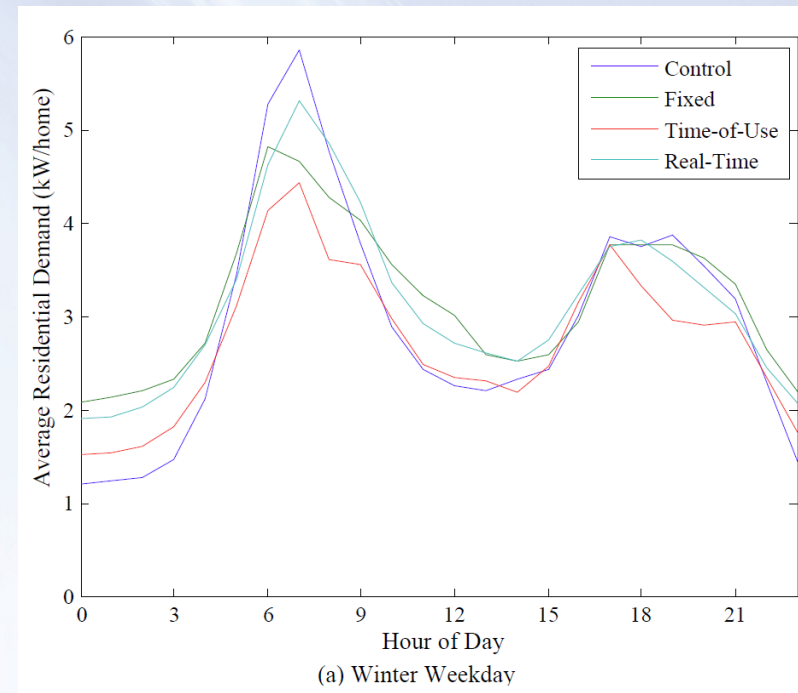
GridWise Olympic Peninsula Project, Washington, USA

The Trial

- 120 volunteer households
- Real time pricing
- Automated thermostats (hot water / heating / air-conditioning)

Results

- Short-term peaks loads reduced by 50%
- Overall peak load reduced by 15%
- Electricity bills reduced by average of 10%



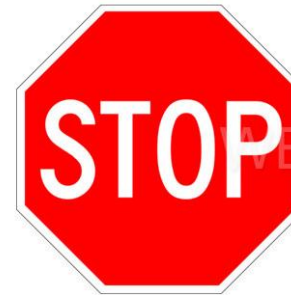
Smart Meter and ToU rollout out, Victoria, Australia

Smart Meters

- **Mandated roll-out commenced 2009**
 - **Due to be completed 2013**
 - **Under review**
 - Claim over 'flaws' in cost-benefit study

Time of Use Pricing

- **Mandated for all customers with Smart Meters**
 - **Moratorium announced 2010**
 - Concerns over impact on low-income households / elderly

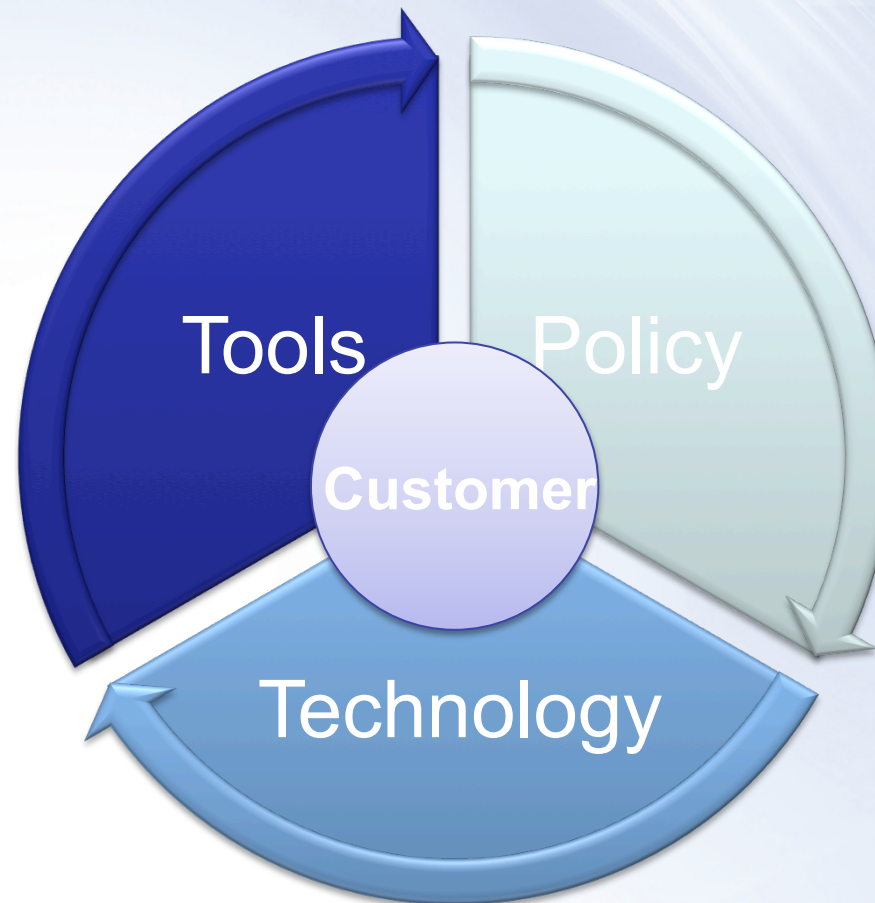


DO NOT INSTALL SMART METER

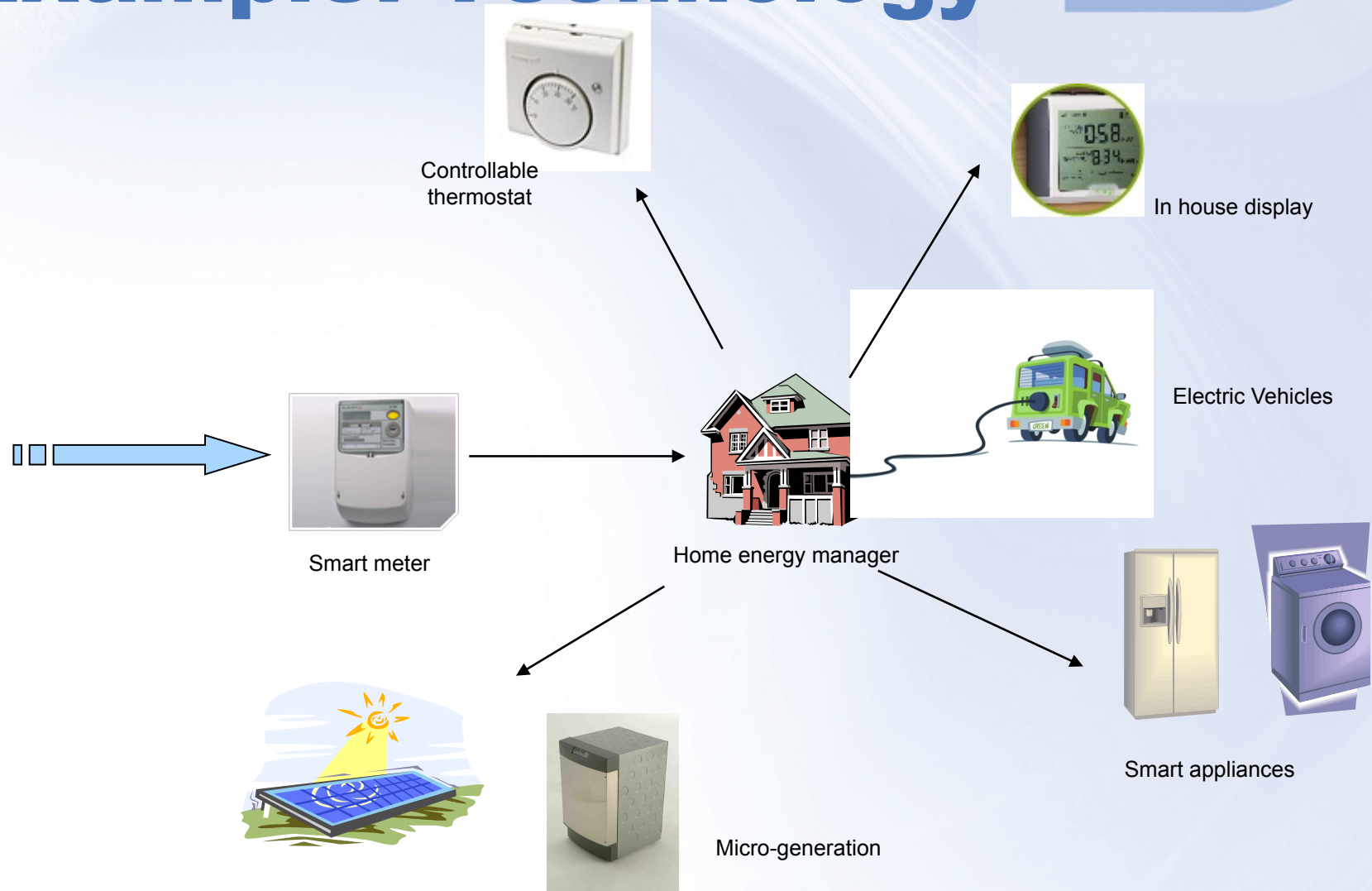
I DECLINE TO HAVE A 'SMART METER' FITTED UNTIL AFTER THE STATE GOVERNMENT HAS COMPLETED THE 'SMART METER' REVIEW PROCESS.

THANK YOU.

What? (The scope of Task 23)

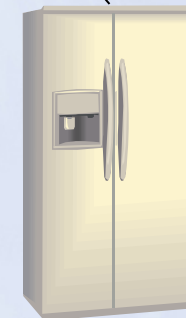
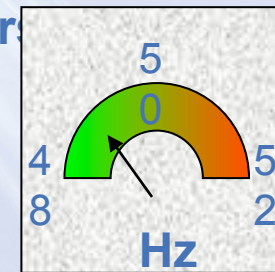


Example: Technology



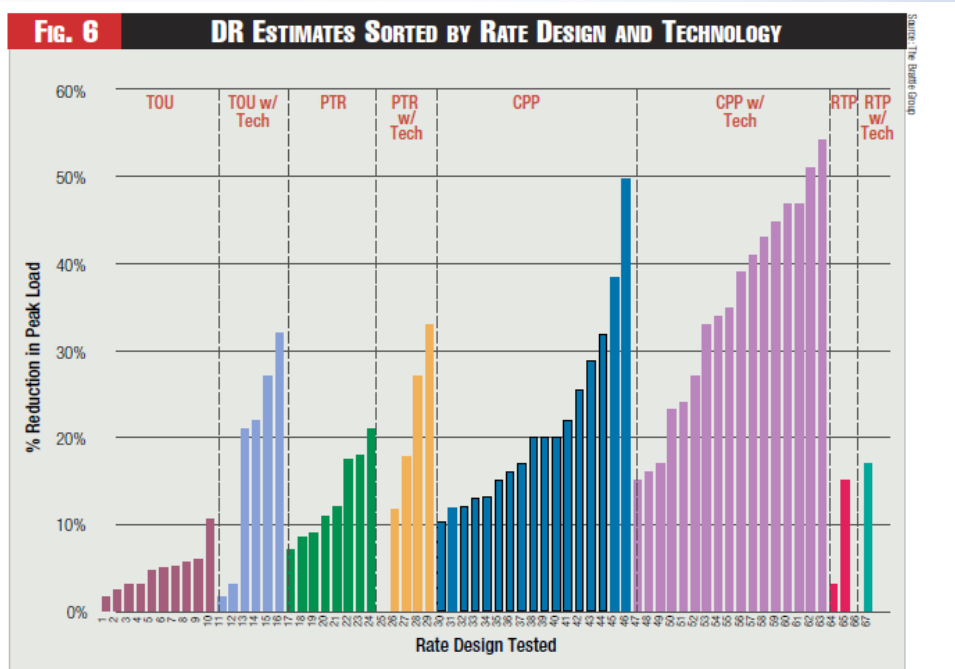
Example: Policy

- Frequency response using domestic fridges/freezers in the UK
- Annual savings
 - £0.70 to £5.60 per fridge
 - 17 to 44kg CO2 per fridge
- If scale this to all households (22 million in UK)
 - Savings are significant
- How to motivate customers to buy them?
 - Benefits to customer
 - Very small
- Mandate the technology in all new appliances?
 - not straightforward



Example: Tools

- What is the role of innovative tariffs in delivering Demand Response?



Rethinking Prices, The changing architecture of demand response in America
A Faruqi, R Hledix, S Sergici



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Protecting the Community

SWITCH OFF

NEW CAMPAIGN TO WARN OF ELECTRICAL FIRE RISK

The minister of community safety Fergus Ewing recently launched the new Fire Safety in the home TV advert at Maryhill Fire Station with Jim Donaldson representing the Tayside Fire Rescue community safety dept. Each week in Scotland two families suffer fires in their home due to a faulty washing machine or dishwasher while electrical problems with televisions cause a domestic fire every fortnight. The fire risks from cooking are well known and most often due to misuse of the equipment. But most involving other electrical goods are due to a fault with the appliance and a key message of the new campaign is to minimise risks by switching off the equipment when going to bed or leaving the house.

For further information

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