Are consumers aware that they play a role in cost efficient and energy efficient Smart Grids?

*Initial results from Task 23 of the IEA DSM Implementing Agreement*

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EA Technology

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Are consumers aware ..

• ...of Smart Grids?

• ...of the role of customers (in general)
  – in delivering energy efficient Smart Grids?

• ...of their role (specific)
  – what can I do?
Are consumers aware ..

• …of Smart Grids?
  – of existing electricity grid and the stakeholders?

• …of the role of customers (in general)
  – in delivering energy efficient Smart Grids?

• …of their role (specific)
  – what can I do?
Are consumers aware of the industry stakeholders and what they do?

<table>
<thead>
<tr>
<th>Role</th>
<th>Residential Customers Republic of Ireland</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ESB Networks</td>
</tr>
<tr>
<td>Responsibility for power failure repair</td>
<td>56%</td>
</tr>
<tr>
<td>Maintenance of grid</td>
<td>56%</td>
</tr>
<tr>
<td>Responsibility for Meter reading</td>
<td>17%</td>
</tr>
<tr>
<td>Responsibility for billing and payment</td>
<td>10%</td>
</tr>
</tbody>
</table>

Findings from the 2009/2010 research on residential and business attitudes and experiences of the electricity market across the island of Ireland, The Research Perspective Ltd for CER and Utility Regulator, 2010, p20
### Implications?

Which electricity supplier should I choose?

<table>
<thead>
<tr>
<th>Reasons for not switching electricity supplier</th>
<th>A factor</th>
<th>Not a factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Like current service</td>
<td>54%</td>
<td>19%</td>
</tr>
<tr>
<td>No reason to</td>
<td>46%</td>
<td>28%</td>
</tr>
<tr>
<td>Concern about an alternative supplier’s provision of a reliable supply of electricity</td>
<td>36%</td>
<td>34%</td>
</tr>
<tr>
<td>Concern about alternative supplier to be as responsive if there is a power outage</td>
<td>35%</td>
<td>35%</td>
</tr>
<tr>
<td>Do not believe that prices will remain as low as the alternative supplier claims</td>
<td>35%</td>
<td>32%</td>
</tr>
</tbody>
</table>
For another example – see...

Consumer awareness of specific technologies and concepts – Smart Meter example

Before today, had you heard of smart meters?

- Yes, I have one: 5%
- Yes, but I don't have one: 44%
- No, I have never heard of them: 50%
Consumer awareness of specific technologies and concepts – Smart Meter example

How much, if anything, would you say you know about smart meters?

- Just a little: 56%
- A fair amount: 19%
- A great deal: 5%
- Heard but know nothing: 20%

Quantitative Research into Public Awareness, Attitudes, and Experience of Smart Meters, wave 2, Feb 2013, MORI for DECC
Consumer awareness of technologies—In Home Display example

- Participants in a trial were asked “Do you have a visual display in your home, that tells you how much electricity or gas you are using?”

<table>
<thead>
<tr>
<th>Intervention</th>
<th>RTD (elec only)</th>
<th>RTD (dual fuel)</th>
<th>RTD + ToU</th>
<th>RTD + Usage Alarm</th>
<th>RTD + Heating controller</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>45.8%</td>
<td>35.2%</td>
<td>50.9%</td>
<td>62.4%</td>
<td>36.1%</td>
<td>46.5%</td>
</tr>
<tr>
<td>No</td>
<td>54.2%</td>
<td>64.8%</td>
<td>49.1%</td>
<td>37.6%</td>
<td>63.9%</td>
<td>53.5%</td>
</tr>
<tr>
<td>Number</td>
<td>83</td>
<td>105</td>
<td>114</td>
<td>109</td>
<td>97</td>
<td>508</td>
</tr>
</tbody>
</table>

RTD = real time display  
ToU = time of use (tariff)
Are consumers aware ..

• …of Smart Grids?

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• …of their role (specific)
  – what can I do?
An energy efficient Smart Grid
- What is the role of consumers?

1. Reduce overall consumption

![Energy Saving Graph](image)
An energy efficient Smart Grid & the role of consumers

1. Reduce overall electricity consumption
2. Reduce peak electricity demand
An energy efficient Smart Grid &
the role of consumers

1. Reduce overall electricity consumption

2. Reduce peak electricity demand

3. Shift electricity demand

Source: Red Electrica de Espana presentation at IEA DSM Workshop October 2020
Consumer Awareness of Energy Efficiency

- What actions lead to the greatest energy savings?
- What is the magnitude of energy savings?

Do you think you understand enough about the actions you can take to optimise your energy consumption?

- Yes, 75%
- No, 25%
Consumer Awareness of Energy Efficiency

• What actions lead to the greatest energy savings?
• What is the magnitude of energy savings?

• A 2010 US study found:
  – Consumers not proficient at identifying ways of saving energy
    • Focus on curtailment actions rather than energy efficiency improvements
  • Tendency to underestimate energy use
    • Particularly the magnitude of differences

Public perceptions of energy consumption and savings, Shahzeen Z et al., PNAS, 2010
Awareness of pattern of consumption? An example

Ex Ante SMP and System Load (13 November 2012)

Disjoint between retail price paid by customers and wholesale price

Source: SEMO
Awareness of pattern of consumption? A second example

Time of Use tariffs
- a tool to help increase awareness

Awareness of pattern of consumption?

Time of Use tariffs - a tool to help increase awareness

But only limited number of households have some form of time of use tariff

Based on data from US Energy Information Administration, & eMeter
## Customer willingnessness

<table>
<thead>
<tr>
<th>Total number of participants</th>
<th>Very or fairly likely</th>
<th>Very or fairly unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>☺️ ☻️</td>
<td></td>
</tr>
<tr>
<td>Heat water at different times of the day</td>
<td>56%</td>
<td>25%</td>
</tr>
<tr>
<td>Use certain appliances after midnight</td>
<td>51%</td>
<td>33%</td>
</tr>
<tr>
<td>Install technology to automatically switch off appliances when prices are high</td>
<td>47%</td>
<td>31%</td>
</tr>
<tr>
<td>Carry out chores such as cook meals in cheaper periods (e.g. after 7pm)</td>
<td>41%</td>
<td>40%</td>
</tr>
<tr>
<td>Use electric storage heaters</td>
<td>35%</td>
<td>47%</td>
</tr>
</tbody>
</table>
Consumer Awareness

- Smart Meters provide opportunity for consumers to become aware of amount / pattern of consumption