



# Consumer Positions and Attitudes

Smart Grid Forum  
Research Presentation Day  
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# Agenda

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Objective: To glean anticipated consumer behaviours regarding smart grids from ...

- Consumer expectation (surveys & noticed behaviours)
- Evolving Attitudes - Ontario
- Specific Utility Studies
- General Consumer Behaviours
- Conclusion

# Consumer Expectation

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## Consistent consumer expectations

- ✓ I want **Reliable and good Quality Power** relative to what I have now
- ✓ Electricity is a **necessity** for me and using it **can get expensive** though I may not think twice about spending my money on other things. If the price increases, I may concede if I can still see the **value**. I will control or reduce my use if it's **easy** and there is a **good return**.
- ✓ I rely on my utility for **unbiased advice** on reducing my cost, and am **very satisfied** with the service, though I may hold my utility responsible for the high rates and my high bills
- ✓ I am **socially conscious** and expect the utility to be more so; however, some of that can slip if it's going to cost me more than I'm willing to pay.

*Priority and magnitude of each expectation varies by consumer group (RES, SCOMM, COM, LU), and the consumer's experience*

# Evolving Attitudes - Ontario

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- Social Consciousness
  - ❑ **NIMBY:** ongoing – sighting of transmission, distribution, and generation infrastructure.
  - ❑ **Green Power:** 5 of the 10 licensed electricity retailers provide green power solely or as an option. Renewable energy products found in mainstream retail stores.
  - ❑ **Recycling:** “a good thing to do;” neighbourhood thing; kid or peer pressure. Incentive: social, easy/easier to do, may save (?) on tax bill
  - **Effect:**
    - Utilities adopting and championing social and environmental initiatives
    - Government setting green generation targets

# Specific Utility Study Results

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- Increasing number of studies based on infield demonstration projects.
- Duration ranges from three months to three years, predominantly one year (only one known for three years).
- Results based on the following studies & projects:
  - ❖ 420 Kitchener ON households in a 2003 survey & usage analysis after participating in Home Energy Rating System (HERS) program
  - ❖ 112 Olympic Peninsula, Washington, USA, households in a 2006 Project
  - ❖ 2006 Consumer Feedback Study that looked at the USA, Canada, Scandinavia, the Netherlands, and the U.K.
  - ❖ Britain's Brighton SM project
  - ❖ BGE (Baltimore Gas & Electric) SM & energy pilot study 2008
  - ❖ Utility Consumer Surveys

# Specific Utility Study Results

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- **Who should deliver programs:** *“The change in provincial government may facilitate greater collaboration, but, the primary arena for conservation action remains local communities.”* Supported by consumer survey (CEA) : vast majority would prefer that CDM programs be delivered by the local utility rather than government, agencies, etc.
- **Participant Categories:** <sup>7</sup>
  - **Conservers:** more likely to be lower income and least likely to be higher income; very likely to be interested in reading energy savings material.
  - **Consumers :** already had energy efficient appliances; more likely to be higher income than other groups; more likely to read energy savings material; demonstrated “rebound effect.”
  - **Steady:** do not or can not reduce energy use.

<sup>7</sup> “Comparing residential energy conservers and consumers: Local programs need all income groups to achieve Kyoto targets,” Paul Parker, Ian H. Rowlands, and Daniel Scott, *Local Environment*, Vol. 10, Issue 2, April 2005, pp. 173-187

# Specific Utility Study Results

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- **Motivators:** <sup>7</sup> Top three of eight motivations (for having a HERS evaluation)
  - lower energy bills (62%), gain advice on a specific problem or project (11%), increase home comfort (10%)
- **Barriers:** <sup>7</sup>
  - takes too long, lack of skills, lack of information, lack of time, too much mess, unconvinced about benefits., cost of upgrade too much.
- **Incentives & Disincentives:**
  - **Price:** the savings must be meaningful (so, TOU rate spread has to be “big enough”), rate structure easy to understand & follow plus not dynamic. Consider, rather than penalize if use is on-peak, give bonus if stayed off peak & avoid changing existing rate structure.
  - **Comfort:** i.e., Thermostat Control – revolt in California, acceptance in Ontario. Elderly and those with kids may forgo savings for comfort.

<sup>7</sup> “Comparing residential energy conservers and consumers: Local programs need all income groups to achieve Kyoto targets,” Paul Parker, Ian H. Rowlands, and Daniel Scott, Local Environment, Vol. 10, Issue 2, April 2005, pp. 173-187

# Specific Utility Study Results

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- **Feedback:** <sup>13</sup>

*“Clear feedback is a necessary element in learning how to control fuel use more effectively over a long period of time and that instantaneous direct feedback in combination with frequent, accurate billing (a form of indirect feedback) is needed as a basis for sustained demand reduction.”*

“Feedback context is important; graphical or tabular display of the disaggregate usage is key to associating load and usage.”

- **Pay-as-you-go** meters may bring 3% to 20% savings.
- **Direct feedback** i.e., free-standing display or clearly visible meter / monitor / colour-change orb, may bring 5%-15% savings. High users respond better than low users. Generators’ increased awareness led to a conserving behavioural effect so they could buy less or sell more.

13 “The Effectiveness of Feedback on Energy Consumption: A Review for DEFRA of the Literature on Metering, Billing and Direct Displays,” Sarah Darby, April 2006, Environmental Change Institute, University of Oxford

# Specific Utility Study Results

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- **Indirect feedback** i.e., a bill, is useful in demonstrating longer term usage reductions from capital change i.e., insulation upgrades, upgrade to energy efficient appliances, etc. , or increase due to weather or make-up of a household.
  - Comparing to own historical use is most effective. Comparison to “the norm” or others was of interest yet, not a motivator for change. People were sceptical of the comparison and felt they were assigned to the wrong group.
  - Accurate and frequent billing is more helpful than estimated or long period billing. Savings through accurate, more frequent billing with comparative feedback to self ranged from 0% to 12% in England and Norway; however, customers had previously been used to bi-monthly bills and only one or two readings per year.
- **On-line billing**, a.k.a. web presentment, is inconvenient for gaining immediate consumer intervention, however, useful in providing more detail plus more advanced analysis after the fact. It does not substitute for a separate display that shows “moment-to-moment” behavioural impact.

# Specific Utility Study Results

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- **Persistence:**

*“Persistent feedback promotes persistent conservation behaviour”*

*“As a rule of thumb, a new type of behaviour formed over a three-month period or longer seems likely to persist – but continued feedback is needed to help maintain the change and, in time, encourage other changes.”*

- The longest persistence study was in Oslo on informative billing:

*“Our impression from interviews is that after three years the changes people made had become so routine that they had trouble identifying them.”*

# General Consumer Behaviour

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- **Many studies and theories** may help extrapolation of existing short term study results to form anticipated long term behaviours.
- **Many studies & theories include these types of conclusions:**
  - Legislation, not education or incentives, supports persistent consumer participation in an agenda (bike helmets, seat belts, trans-fats, ...)
  - To change behaviour, persistence is needed
  - To change behaviour constant education and incentives are needed
  - Barriers tend to be: financial, knowledge, trust
  - Incentives tend to be: financial, regulatory, social

# General Consumer Behaviour

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- **Traits never change; behaviour is constantly reassessed; opinions change as new information is presented.** <sup>1</sup>
  - When assessing the relationship between experience and emotion an individual's longterm learned behaviour emerges.
  - “EcoAlign Research” found that company offerings do not match consumer values; consumer purchases do not match their stated value for sustainability.

<sup>1</sup> “Can Smart Meters Change Customer Energy Consumption Behaviors? The Key Question to be Answered,” 2008 “ET” Summit, Oct. 26-28, 2008, Tom Brunetto, Managing Partner, DEFG LLC

# General Consumer Behaviour

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- **“Rebound Effect” of concern**
  - When the stimulus that drove behavioural change or the basis for accepting the stimulus is no longer present, the consumer reverts back to the normal comfort way or zone, for example:
    - The price of gasoline goes up a lot, drive less; price of gasoline goes down a little, drive more.
    - Convert low energy use appliances to more energy efficient ones, save some money and then buy other energy using (comfort) products.
    - The appliance is more efficient so I can use it longer for the same impact as before, or a little less.

# Conclusion

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- **When developing programs:**

- ✓ Make personally relevant – what do I have to do, how will it affect me and how much will it cost me
- ✓ Consider situational factors -- home ownership (length & expected stay), length of tenure, potential for energy savings.
- ✓ Consider socio-demographic factors -- age (elderly and young families may not reduce thermostat temperatures); education; number of children; knowledge, experience, and social context.
- ✓ Consider psychological factors -- “motivations [cost savings, comfort, environmental concern], perceptions of environmental threats and the efficacy of taking action,” “perception of subjective norms and social pressures”
- ✓ Rely on the manufacturers’ consumer behaviour experience -- Leave appliance response decision/protocol to price or other signals to the appliance manufacturer. Whirlpool will create appliances that help DSM/EM; however
  - ✓ Need rules and price structures set & steady – they’ll market how their appliance takes advantage of such
  - ✓ Want to build-intelligence in appliance to balance consumer convenience, utility savings, expected appliance performance and manufacturer guarantee

# Conclusion

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√ Speak the consumer's language 1 –

## Consumer Values

Consumption equates to wealth

Freedom of Choice

Comfort and design

Convenience

Commodity

Environmentally or Socially Conscious

## Consumer Offer

Efficiency and sustainability

Lifestyle changes

Behavioral changes

Save resources

Pay higher prices

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Primary Source: Market research by EcoAlign.

# Conclusion

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- **More studies are in progress i.e.,**
  - Milton (Smart Houses)
  - Boulder Colorado (Smart City)