Creating **Solutions** *with Energy*

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Presentation Overview

Smart Meters and the Consumer

Real-time Feedback

Enabling Technologies of Real-time Feedback

Blue Line's Solution – The PowerCost Monitor

Studies

Ontario Projects

Conclusions

Questions

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Smart Meters and The Consumer

- Technology should offer highest benefits for the end-user of electricity. (Benefits for the utility are important, but secondary)
- Consumers should look to adopt the technology – market pull not market push.
- Different customer segments will benefit from smart meters at different levels.
- The best approach is to understand the needs of each customer segment and provide them with the appropriate solution that is most cost-effective.
- Implement a range of cost-effective, smart technologies and the customer should have choices.

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Real-time Feedback

There are numerous studies by utilities and leading research institutes that confirm that real-time feedback of energy consumption yields energy savings of ten to twenty percent.

Real-time Feedback Impact on Residential Electricity Consumption

- Studies 10-20% reduction (Oxford, Princeton, Ontario Hydro)
- Primary Outcome: real-time feedback reduces total consumption
- Other Outcomes: load shifting, energy efficiency awareness, purchasing choices, etc.

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Enabling Technologies

Real-time Feedback (simple examples)

- Posters (Princeton Study)
- Desktop Computers (Ontario Hydro)
- Interactive Feedback (Web-based solutions)

Effective Real-time Feedback Technology should be:

- "Real-time" (moment-to-moment)
- Consumer-oriented
- Easy to use
- Simple to install
- Scaleable
- Affordable
- Informative (rate of consumption, total and predicted consumption)

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PowerCost Monitor

What it is NOT:

- AMR
- Pay-as-you-go
- Interval/TOU Meter
- Load Planning Device
- Replacement Meter

The PowerCost Monitor is designed to provide the consumer with moment-to-moment knowledge of their electricity consumption.

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PowerCost Monitor

(Cont'd)

- The PowerCost Monitor is designed for residential use
- Its hardware and software are completely consumer-oriented
- It consists of two discreet functional units:

1. Detection unit is affixed to an existing household electromechanical meter
   - Tracks the amount of energy consumed by counting cycles of the meter disk.
   - Can be quickly attached and detached

2. Display unit is located inside the home
   - Receives a wireless input transmission from the detection unit
   - Displays the information in real time for the end user.

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Case Study

In a 1993 study, Ontario Hydro demonstrated that real-time feedback has a positive impact on energy conservation.

The real-time feedback group achieved average daily consumption rates that were 12.9% less than the control group.

Ontario Hydro concluded that the consumers were conditioned by the real-time feedback device to think about electricity usage in ways not possible without specific feedback

The report went on to point out that “immediate feedback may become one of the central components in promoting conservation behaviour.”

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Other Feedback Studies

"Making it obvious: designing feedback into energy consumption". Sarah Darby, Environmental Change Institute, University of Oxford. 2000.

"The Effect of Goal Setting and Daily Electronic Feedback on In-Home Energy Use" Jeannet H. Van Houwelingen. 1989.

Other real-time feedback studies available

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New Ontario Projects

Hydro One installed 500 PowerCost Monitors in early July, 2004 (Pilot website www.bluelineinnovations.com/pilot)

London Hydro has joined Hydro One study (70 additional units)

Key objective:

To determine the extent to which consumer behaviour is changed and electricity usage reduced by the availability of direct "*real-time*" feedback information of electricity consumption.

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Conclusions

The PowerCost Monitor is a retrofit for existing electromechanical meters.

It makes dumb meters “smart”.

The device is a fraction of the cost of smart meters.

Is easily installed by residential consumers, (scaleable).

Overall reduction in consumption of 10-20%.

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Discussion - Questions?

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