RÉPONSE DU GRAME À LA DEMANDE DE RENSEIGNEMENTS no1
D'HYDRO-QUÉBEC AU GRAME

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Note : Seules certaines parties du document suivant
« **Report of the Conservation Action Team** » ont été présentées ci-dessous.

GRAME-4, document 5

Pour :
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(GRAME)

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Ministry of Energy

Building a Conservation Culture

Report of the Conservation Action Team
to the Honourable Dwight Duncan, Minister of Energy

Contents

Executive Summary

The Conservation Action Team was established in January 2004 with a mandate to seek out the best conservation ideas and practices, and promote conservation through outreach to energy sector stakeholders and the citizens of Ontario. Broadly speaking, the Team was to act as the government's champion for conservation. Its role was to assist in the creation of a conservation culture in the province.

The Team consulted widely, meeting with over 300 groups and individuals who represented virtually all sectors, leading-edge technologies and a wide range of interests in energy. The Team conducted its work within a rapidly evolving policy context, as the government moved to put the electricity sector back on firm footing and introduced new measures, including: targets for reducing demand and increasing renewable supply, a new rate structure, smart meters, and legislation to create an institutional infrastructure for conservation.

The Team received extensive advice from stakeholders. We learned that there is a need for government to provide leadership in conservation by setting broad direction and strategy. Ontario's private and voluntary sectors have expertise and can partner with government to deliver conservation. Stakeholders advised us of many barriers to energy efficiency and renewable energy - regulatory, financial, informational, institutional, policy and others - that need to be addressed. We also heard about new technologies, opportunities and models to instill conservation that could be adopted and built upon.

The government has taken immediate action on several of the barriers and opportunities that were raised with the Conservation Action Team. These are described in our report.

Our report concludes with a set of 30 recommendations to respond to the issues we identified. Our recommendations address: the future role of the Team and the newly created Conservation Bureau in building a culture of conservation; actions required for government to put its own house in order; ways to lever conservation into provincially-funded infrastructure projects and capitalize on horizontal policy activity across government; the reform of codes and standards for which the government has authority; and, suggestions for outreach to vulnerable energy consumers and other targeted groups.

Introduction

Mandate

The Conservation Action Team (CAT) was established on January 16, 2004 with a mandate to assist in the creation of a conservation culture in Ontario and make demand management a cornerstone of Ontario's long-term energy policy framework. The Team's role, as announced by the Minister of Energy, was to champion conservation by:

- promoting the government's conservation initiatives;
- engaging stakeholders to seek out and promote best practices;
- developing a framework to assist in meeting the government's target of five per cent reduction in electricity consumption;
- working to identify and remove barriers; and,
- exploring ways for government policies and programs to incorporate conservation principles.

The Team's members represented a range of government ministries, providing outreach to a broad group of stakeholders and facilitating linkages to sector-specific opportunities for energy efficiency.

Terms of Reference

The Conservation Action Team adopted the following terms of reference:

The Team will engage sector specific stakeholders (e.g. agriculture, business) and provide outreach to these organizations.

The Team will assist government's efforts to lead by example in its own operations and those facilities that receive significant provincial funding (e.g. schools and hospitals).

The Team will work to identify and initiate the removal of any unnecessary barriers to conservation, which are embedded in government policies, programs, procedures, codes and standards consistent with the government's philosophy to find new and better ways to do business.

The Team will encourage ministries to integrate conservation in new policies and programs (e.g. educational curriculum and building codes).

Role and Operation

Individually, the role of Team members was to champion conservation, including energy efficiency, renewable energy, and distributed energy. As team members, parliamentary assistants assisted by screening policies and programs of their ministries to ensure they facilitated rather than discouraged conservation. Team members also acted as liaisons with ministry and geographical stakeholders.

Collectively, the role of the Team was to act as an advisory committee for the framework by: providing input to the plan including communications plans and programs; integrating cross-ministerial conservation activities; acting as a network to share information, successes and challenges; and, reporting on achievements and challenges.

The Team met 15 times between January and December 2004 (typically one morning meeting bi-weekly), receiving briefings from over 300 organizations, individuals and companies.

These sessions were an opportunity for stakeholders to discuss issues and opportunities, educate the Team about new technology and services, and suggest policy direction and collaborative projects for the government to consider.

Parliamentary assistants also met with stakeholders individually, attended conservation related forums with constituency groups and community associations, as well as conducted site visits of innovative technology. During the final meetings of 2004, parliamentary assistants also reported on and led a discussion of barriers specifically related to their ministry's policy and programs.

Government Policy Context

In its January 2004 report to the Minister of Energy, the Electricity Conservation and Supply Task Force recommended that Ontario needed a conservation culture to deliver cumulative and sustainable improvements in energy use and demand response. The government responded with several announcements to set the foundation for a conservation culture.

The Conservation Action Team was established, as well as a conservation target of a five per cent reduction in peak electricity demand (equal to 1,350 megawatts) to be achieved by 2007. In order to lead by example, a ten per cent target was set in the government's own operations (equal to 62 million kilowatt-hours).

New legislation, the Electricity Restructuring Act, 2004, was passed to reform the sector and provide an institutional infrastructure for demand management. Under the new legislation, a Conservation Bureau will be housed within a new Ontario Power Authority, and headed by a Chief Energy Conservation Officer. While the Minister of Energy retains directive power to set conservation targets, the Bureau will be responsible for developing plans to meet these targets and administering demand-side management programs.

An interim two-tier pricing plan was created to encourage conservation, and the Ontario Energy Board was directed to develop a new rate plan that will encourage time-differentiated rates and wise use of electricity.

Targets to provide smart meters - meters designed to measure the time of day when power is consumed and allow consumers to provide demand response by shifting their consumption to off-peak hours - to complement time-of-use rates were announced. By 2007, 800,000 smart meters are to be installed and every consumer is to have a smart meter by 2010.

Local distribution companies (LDCs) were allowed achieve their full commercial rate of return on the condition they invest an amount equivalent to one year's worth of this money in demand-side management programs (up to $163 million).

Action was also taken to encourage renewable energy with the issuance of a request for proposals. Contracts for ten projects - including wind, small hydro and landfill gas - amounting to 394 megawatts of capacity were signed. The government partnered with the Lynn Cattle Company to invest in an anaerobic digestion facility to produce power at the company's operations and sell 2,500 megawatt-hours of power annually to the municipality of North Middlesex. Rebates of the retail sales tax are provided for solar energy systems installed in residential premises and similar rebates are proposed for small hydro, micro-turbines and geothermal systems.

Taken together, these measures signal a reversal of the former approach to energy policy, which considered conservation as an afterthought. Over the past two decades, Ontario's policy has evolved from the hardware focus and incentive approach of the 1980s through the market-based solutions of the 1990s, whose emphasis on supply neglected how the market would encourage demand response.

Today, a new approach is developing that includes a role for regulatory standards and well-functioning markets but with an emerging focus on consumer behaviour and community involvement. This approach incorporates people, devices and regulated markets. The challenge of the Conservation Action Team has been to establish the commitment to conservation as central to energy policy, lead stakeholders in this direction, and engage Ontarians to adopt this approach.

Consultations - Who We Met and What We Heard

The Team received presentations from a diverse group of stakeholders (see Appendix B), gaining both breadth and a depth of knowledge through these consultations.

Presenters included associations that advocate for conservation and renewable energy, as well as groups who represent building and water works operators, the agricultural community, small business, large energy-intensive industries, schools and post-secondary institutions. Companies marketing new technologies, economic consulting firms, LDCs, municipal departments, local chambers of commerce and energy service companies were also consulted.

In addition, briefings on energy issues were provided throughout the year by staff from several ministries and agencies, and there was close liaison with staff of Ontario Conserves - responsible for continuing the dialogue between citizens and their government, it is consulting and educating the public on conservation.

The Team participated in several hands-on site visits: the Kortright Centre for a demonstration of leading-edge technology, Woodstock Hydro to learn about its pay-as-you-go billing, and a smart meter workshop with manufacturers.

The views and issues discussed during consultations are summarized below under several broad themes. Views often expressed related to working together with government, the need for government commitment and leadership, financing and incentives to overcome the incremental costs of conservation and renewable energy, reforming regulations, codes and standards, and providing outreach and education.

Opportunities for Partnerships and Action on Conservation

All stakeholders expressed a willingness to partner with government on joint projects. Examples of existing partnerships for market transformation were offered as the type of programs that government could join, endorse, assist or emulate. Among others, these included Toronto's 20/20 Way to Clean Air, the One Tonne Challenge, Mayors

Megawatt Challenge, Green$aver, Cool Shops, Keep Cool, Energy Wise, the LEED building rating system.

Many stakeholders pointed to the expertise and capabilities that exist in Ontario. Stakeholders offered their services as a formal or informal advisory body. Some expressed particular interest to work together on specific issues like building codes and equipment standards to drive further efficiencies, perform energy audits, make socially assisted housing energy efficient or raise public awareness.

The Team received advice to make conservation easy and accessible by involving non-government organizations (NGOs) since NGOs enjoy public trust, and are a knowledgeable cost-effective resource with programs already in place. The Team was also told that conservation could be made attractive through rewards type programs or by levering private sector participation to reach consumers at point of purchase. Stakeholders believed this would build a viable conservation culture that the old approach of handing out free light bulbs, for example, did not.

Many who endorsed this approach framed government's role as one of setting policy, standards, targets and facilitating access to capital while pushing the front-line work down to third parties, the voluntary sector, utilities, building operators and others.

A host of suggestions on action that could be taken were provided. Examples of some specific areas or sectors for proposed activities included the following.

Initiatives offered with respect to the built environment were to update building codes, adopt the LEED (Leadership in Energy and Environmental Design) green building rating system for government's own buildings or investment in facilities, streamline permitting systems for energy efficient buildings, provide labeling systems for buildings to educate home buyers, and provide training and workshops for building operators.

In the education and training sector, it was suggested that delivery models like EcoSchools (a partnership of school boards, teacher associations, government and NGOs) could be expanded across the province to reduce energy use in schools and provide classroom materials on conservation. Existing programs, such as those at Seneca College in

Toronto, could provide training about energy use in buildings. Performance-based training could be developed through colleges, and research conducted through the new Centre of Excellence for Energy.

The Team learned that the energy-intensive operations of water treatment facilities are an opportunity to save energy. It was suggested government work with the sector to provide pilots, workshops and best practices. New MUSH capital infrastructure should include energy savings requirements.

In the retail sector, opportunities for lighting retrofits, upgrading HVAC and performing energy audits in shopping malls and stores were indicated.

Smart Meters

The Team was briefed about the implementation plan for smart meters, and agreed on the need for further study of smart meters, as well as the issue of individual or sub-metering in multi-unit residential buildings.

Representatives of Woodstock Hydro, which offers an innovative service to help consumers manage their electricity consumption, stated that pre-paid electricity should be available to those who want it. It can be combined with a "tracking device" made available in homes to monitor price and demand. The company's data showed that pre-paid metering enables significant conservation by giving consumers information on consumption patterns.

Barriers

Several stakeholders raised the issue of barriers faced by conservation. Those working to improve the efficiency of energy use in buildings mentioned high information/transaction costs, performance uncertainties, the incremental cost of efficient equipment, the inertia created by existing organizational practice, split incentives that mean building owners do not receive the savings resulting from implementing demand management, and difficulty securing financing.

The MUSH sector (municipalities, universities, schools and hospitals) faces financial barriers because of constrained budgets. Funding is flowed as a year-end allocation and does not allow for long-term planning, and money is often directed at immediate operation and maintenance needs. Training for building operators about energy efficient equipment and design is not

adequate, and stakeholders do not proficiently articulate their training needs to government.

In other sectors, like retailing, the Team learned of similar financial, administrative and awareness barriers.

During the course of the past year, Team members learned the fact that even our own government structure on occasion acts as a barrier to implementing conservation, as the operation of ministries can create a silo effect.

In addition to those barriers to renewable energy noted above, wind proponents raised other barriers. These stakeholders indicated that detailed wind mapping is needed and the queuing system inhibits them from optimally accessing the grid. In some rural areas, the capacity of the transmission grid is limited and restricts development of turbines. At present, it remains difficult to obtain financing and there can be long payback periods for smaller capacity turbines. "NIMBY-ism" creates opposition to development and there can be a public perception that turbines are noisy.

Some groups interested in renewable energy, like the agricultural community, noted a general lack of information about renewables and the value of farmland to wind generators. In addition, environmental regulations restrict the fuel used in anaerobic digesters, and the Certificate of Approval system can inhibit the implementation of conservation measures. Regulations also restrict the production of useful steam (from bio-energy) by greenhouse owners. The agricultural community considers the paperwork to become an IESO (The Independent System Market Operator) market participant burdensome; and, opposes the proposed net metering regulation's restriction of generation for sale.

All renewable energy advocates stated that incentives (financial or market-based like emissions trading) would assist development, and some suggested that government provide a standard offer for renewable energy or a renewable portfolio standard.

Technology

The Team received presentations on the benefits and potential of several emerging technologies. Advocates of clean coal stated that improvements had been made with respect to emissions of chlorine, sulphur and mercury.

Companies involved in commercializing new technologies like gateway systems requested that government play a role in growing the market for bi-directional fibre-optic communications platforms for residential consumers. It was suggested that government could also play a role in mandating common protocols and standards for network hardware and software. An approach frequently mentioned by stakeholders for communications and renewable technologies was government involvement in pilot programs in selected communities.

Finally, the Conservation Action Team also learned about the technologies available to create energy from waste (EFW) and heard that there is a need for a champion for EFW using municipal solid waste. Team members believe that EFW may be an issue that makes its way on to governments' agendas, more likely for reasons related to land fill sites than energy supply. Furthermore, Team members felt EFW is a crosscutting issue that touches other policies, such as land use and green belt protection or assisting municipalities. For these reasons, the Team agreed it would be useful to further explore EFW options.

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Renewable Energy

- Be it resolved that the Government of Ontario encourage the use of renewable energy by **implementing Advanced Renewable Tariffs** which will allow distributed renewable energy; such as, but not limited to, solar, small hydro, wind, biomass and other forms of energy to be established by farmers, co-ops and locally owned enterprises and to market this energy on the provincial grid;
- Be it further resolved that the Government of Ontario make a subsidy available for the purchase and installation of all major "Green" technologies which can be utilized to provide energy for residential dwellings, offices businesses and industry (products such as geothermal heat systems, solar-assisted hot water heaters, heat

pumps, small-scale wind generators, **net metering equipment**, etc.);
- Be it further resolved that the government of Ontario make appropriate changes in pertinent acts and regulations (e.g. the Planning Act and Building Code) to encourage the use of renewable energy;
- Be it further resolved that **net metering** be an important step in the Provincial energy policy to encourage small renewable initiatives; and
- Be it further resolved that grid owners be mandated to build out their Grids on a priority basis to green energy providers and that a price for green energy be set at a rate to allow for a fair rate of return for renewable energy investors to encourage generation.

Low Income Consumers

- Be it resolved that the Government of Ontario support an energy efficiency program for low income energy users which would help the Province achieve its goals for conservation and reduced energy use while at the same time serving to alleviate the disproportionate energy cost burden faced by Ontario residents of lower income. Energy efficiency measures that would receive financial support would include, but are not limited to, weatherization (retrofitting), furnace replacement and light bulb replacement and smart metering (including retrofitting) of properties occupied by low-income consumers; and
- Be it further resolved that the Government of Ontario enact regulations that ensure that all new housing, including rental units, and retro-fit projects meet exacting energy conservation targets for the building as well as for furnaces and other electricity using appliances in the building **and that smart meters are required in all new units, including units in multi-unit buildings**; and
- Be it further resolved that the Government of Ontario work with suppliers of housing for low income tenants to measures are undertaken to reduce energy use in existing units.

Appendix A — List of Stakeholders Consulted

Note GRAME: Consulter le document officiel

Appendix B — Best Practices and Demonstration Sites

Each of the following institutions will receive a certificate of leadership from the Minister of Energy and have been recognized by the Team for their sustainable energy practices.

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Appendix C — Acknowledgements

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Appendix D — The Framework for Ontario's Conservation Culture

Table of Contents

Introduction

Energy is a universal commodity - everyone uses and needs it - but most consumers do not pay it much attention, except when their bills increase. Energy use and costs are a complex product of energy prices, weather, equipment efficiency, system operations and individual behavior. As such

energy consumption seems difficult to manage. While other household or business expenses receive a good deal of attention, with market forces driving efficiency and cost reduction, energy bills, however, tend to just get paid without detailed analysis. In any event, customers receive their bills long after the energy is consumed, when alternative courses of action could have been pursued.

As a result, the market for conservation does not function effectively. The "conservation industry" is fragmented, hard to access and capacity-limited. The essential elements of effective energy management - knowledge, resources, financing, incentive, and feedback - are mostly lacking, meaning consumers lack information to make reasoned choices. Price signals alone produce limited response.
The economic potential for
reducing energy demand in Ontario is considerable. Each year, Ontario businesses, residents, government and public institutions spend approximately $22 billion on energy for buildings and industrial processes, an amount greater than 5% of Ontario's gross domestic product.

Government leadership is needed to create an effective market for conservation - a market that includes energy efficiency and renewable energy.

Federal, provincial, utility company, municipal and private sector projects in other jurisdictions in Canada and in the United States have demonstrated energy use reductions of 20% to 30%. Realizing this kind of potential across Ontario would substantially reduce natural gas, electricity and coal imports into the province, which total roughly $7 billion annually, and defer some of the need for new supply facilities.

Clearly, Ontario has a significant opportunity to reduce energy costs for consumers, while creating jobs in the province and lowering greenhouse gas emissions through energy conservation. Systemic and sustainable energy conservation will come from an integrated range of actions, from low-cost awareness and education, through to the use of renewable energy, to building retrofits and higher standards for new construction.

The collective benefits of well-managed end-use energy across Ontario are far greater than the cost savings available to individual energy users.

Ontario's energy consumers would take action to reduce costs if they had the knowledge and resources to do so.

Conservation principles need to be embedded in government policy, programs and regulations. Beyond that, specific, targeted programs are required to reduce Ontario's ever-increasing demand for energy and to reduce specific customers' demand for grid-supplied energy. Specifically, conservation includes:

- Improved energy efficiency for products, equipment and systems;
- **Behavioral and operational changes, including application of benchmarking, interval meters or "smart" control systems**;
- Load management: interruptible and dispatchable loads, dual fuel applications, thermal storage, and demand response;
- Fuel switching which reduces the total system energy for a given end-use; and
- Distributed energy: tri-generation, co-generation, ground source heat pumps, wind, solar and district energy/neighborhood energy systems embedded within local energy distribution companies.

Ontario's Conservation Framework

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Engaging And Educating Consumers

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Encouraging Energy Retrofits

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Ensuring Innovation In New Construction

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Sustainable Funding For Conservation

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Benchmarking And Best Practices

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Load Management

Smart metering is a critical enabling technology for conservation. Currently almost all residential and general service (small business) accounts, have analog meters that were invented just after Edison invented the light bulb. They must be read manually by a meter reader visiting the premise, unless the utility has convinced the customer to enter the data themselves on its website. Although most utilities bill every two months, meters are not always read that often. In between actual readings estimates are used, but when reconciling estimated and actual readings, disputes can arise and unexpected costs can result for consumers. Smart metering will include interval metering as well as a communications and information data management network to enable all customers to have ready access to their electricity use data as well as time differentiated prices, which will reward customers for not using electricity during peak hours of the day when demand is high.

Illustrative Tactics

- Coordinating actions to reduce peak summer and winter electrical demand, thereby improving reliability and reducing prices of power.
- Pursuing initiatives such as Enwave's Deep Lake Cooling system.
- Using ground-source heat pumps to reduce heating demand by 75%, and summer cooling peak loads by 30% or more, while improving overall system load factor.
- Encouraging additional conversions from electric to natural gas space heating where available to reduce peak loads in winter.
- Encouraging thermal storage in large commercial and institutional buildings as well as homes can lower peaks.
- Expanding the reach of metering and pricing signals beyond the current 4.5 million individually metered customers. Sub-metering of customers who are currently bulk metered offers these customers the full advantage of pricing signals and sub-metering.

Building The Conservation Industry

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Encouraging Distributed Energy

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Leveraging Additional Resources

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Using Sector Specific Engagement Strategies

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Benefits Of Conservation

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Power System Reliability

Conservation is the most effective, timely, economic and beneficial means of restoring and maintaining balance between electricity supply and demand in the province. Conservation will also reduce imports of high-priced power from neighbouring jurisdictions.

Reducing Water Use And Costs

Ontarians spend $2 billion/year on water and sewage charges. Programs for reducing energy demand can also address end-use water consumption, lowering demand on water supply infrastructure and related energy costs.

Benefits Of Distributed Energy

Benefits Of Smart Metering

Customer Benefits

- Informed and empowered consumers
- Less volatile prices, lower bills (1)
- Immediate feedback
- No estimated bills
- Wider variety of payment options and cycles
- Increased choice

Electrical System Benefits

Asset Management

- Accurate line loss map and condition monitoring
- Reduced line losses
- Positive confirmation of a metering point
- Quantification/Reduction of consumption on closed accounts, e.g. vacant premises
- Meter diagnostic flag

Billing and Customer Care

- Reduced complaints/accounts queries/estimated reads
- Reduced cost of re-worked bills(1)
- Incremental reliability payments - selective load retention
- Customer selected billing dates and frequency
- Eliminate false claims from power surges, damaged goods and stocks
- Outage notification

Collections

- Reduced costs and reduced risk of bad debt
- Cash flow benefit of monthly billing
- Reduced invoice to pay timing

(1) Pilot Program on Interval Meters in the United States showed that 10 to 20% electricity savings were possible when the right price signals were available to customers.

Conservation and Demand Response

- Defer investment in peaking plant by shedding peak loads
- Overall dampening of peak pricing

Field Work Management

- Avoided costs of disconnect/reconnect
- Pinpoint line faults, reduce search costs
- Reduce turnaround time for repairs
- Avoid unnecessary service calls (false power outage claims)

Load Forecasting

- Bottom-up, more granular load forecast process
- Geographically based forecasts of network loads

Metering

- Leverage planned maintenance and refit schedules
- Avoid standard metering reading costs including interfaces
- Avoid one-off trips for special reads (final reads meter checks, etc.)
- Trigger Metering for peak demand management and real time network management
- Tamper detection
- Avoid meter reader hazards (dogs)
- Unusual loads (Grow Operations)

Outage and Restoration

- Avoided costs of mail-out for planned outages
- Positive confirmation of unplanned outage
- Communicate outage and time to restoration
- Reduce call centre traffic

Safety

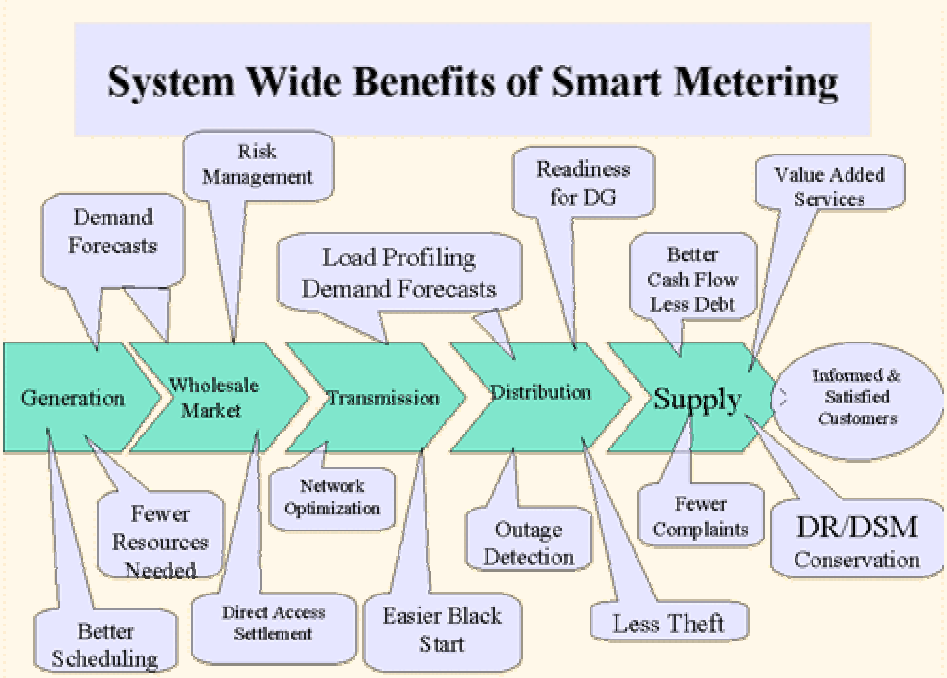
- Isolation of embedded generation
- Line loading
- Fire risk

Rates and Regulation

- Avoids incremental cost for load research for cost of service studies
- Change rates without changing meters
- Performance monitoring for service quality and conservation

Other Utilities

- Synergies with natural gas and water



Barriers To Conservation

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Beyond Conservation