

SGF Agenda Item # 3: Report back from the Working Group

Ontario Smart Grid Forum
Tuesday, October 12th, 2010

Revised – October 11, 2010

**Note: This deck contains revisions relative to the version distributed
to the Forum on October 7, 2010**



Report back from the Working Group

1. Working group deliberations on September 7th action items from the Forum, (re.: revised smart grid capital cost estimates)
2. Discussion of smart grid benefits

Revised – October 11, 2010

The revisions contained in this slide deck affect figures originally presented in slides 8, 9 and 14, in order to bring the projections in line with the latest publicly available retail customer statistics presented in the *2009 OEB Distributors Yearbook*.

Discussion: Smart Grid Rate Impact

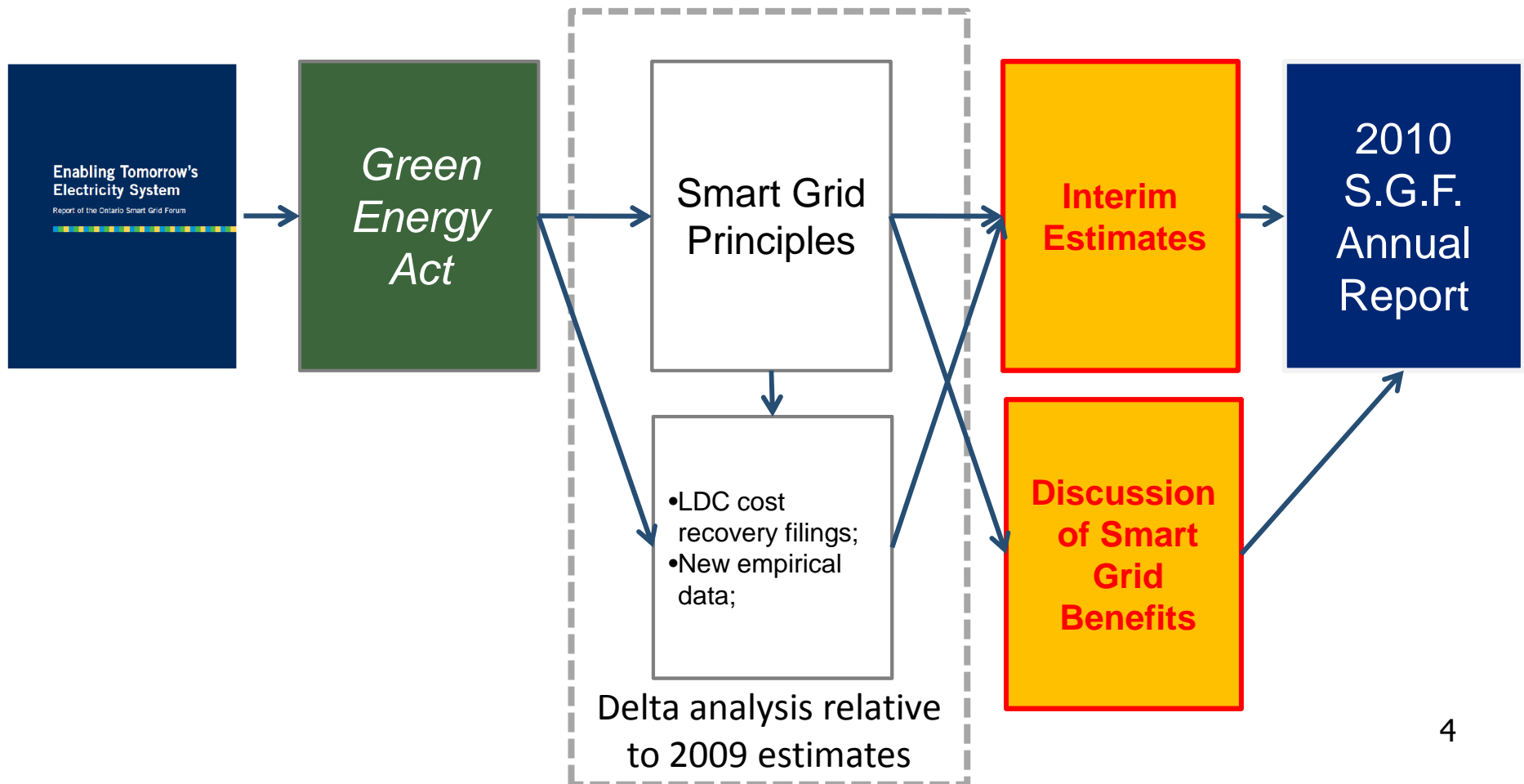
- **Recall:** 2009 SGF Report (*“Enabling Tomorrow’s Electricity System”*):
 - *“Preliminary cost projections prepared by Forum members and extrapolated to cover Ontario’s entire grid sector (distribution, transmission and the IESO) estimate that incremental annual capital spending on a smart grid would average about \$320 million over the initial five years.*”*

* “Comparisons between this estimate and the smart grid spending estimates for other jurisdictions are not meaningful because of the different spending categories included in various figures and the different starting point for each jurisdiction. For example, the above cost estimate does not include the cost of renewable energy resources or any smart meter costs. “

2009

2010

2011



- Feedback from SGF –from the DRAFT minutes of the July 13th SGF (subject to SGF review):
 - “Forum members generally liked the approach of linking potential benefits of the smart grid to the associated cost components.
 - The Working Group will largely be tied up in this effort for the remainder of the year, if it proceeds along the lines proposed. Several members expressed concerns about this, as there will likely be other topics the Working Group will need to address during this timeframe. Several members suggested that this effort needs to be simplified in order to prevent it from becoming a full-blown cost benefit analysis. In this sense, the effort should be re-scaled such that it doesn’t completely utilize the Working Group’s time between now and the end of the year.
 - A lot of what constitutes the “smart grid” is part of the utility’s normal capital cost planning cycle.
 - A member expressed concerns over potential errors in the estimates and their impact on the Forum’s credibility. While some members agreed with this point discussion on this point however, did not cause the Forum to question the underlying need for conducting this work. “

- Feedback from SGF –from the DRAFT minutes of the August 10th SGF :
 - “It was suggested that perhaps the 2010 Annual report should not focus on an overall, aggregate cost estimate number.
 - The *Green Energy Act* embraces the recommendations of the 2009 report and therefore the estimates contained in the 2009 report of the Forum should not be drastically out of alignment as a result of the Act itself.
 - The Forum should spend more time considering the communications issues surrounding the release of these revised estimates that the Working group is currently working on.
 - We need an explicit list of the types of costs that fall within the definition of incremental smart grid expenditure.
 - We need to further discuss the timing of the release of these cost estimates at the September Smart Grid Forum meeting.
 - Customer control cost estimates should be clearly separated from other, common distribution infrastructure costs. “

- Feedback from SGF –from the DRAFT minutes of the September 7th SGF :
 - **ACTION ITEM:** Jim Huntingdon to engage the EDA on the possibility of reviewing the revised capital cost estimates once developed by the Working Group.
 - **ACTION ITEM:** Working Group and IESO staff to engage the OPA in order to include their expenditures in the Consumer Technologies category within the revised smart grid capital cost estimates.
 - **ACTION ITEM:** The Working Group should separate pure “smart grid” costs from those costs that are merely associated with expansion of infrastructure (i.e. those components that truly lend new “intelligence” to the grid).
 - **ACTION ITEM:** The Working Group should account for other sources of public-sourced research and development funding from all levels of government (where applicable to Ontario) as part of the cost estimates in the Innovation and the Economy category – beyond anticipated spending by the distribution sector.

- **Current situation:**
 - Not a lot has changed since the last meeting, however, the Consumer Technology category could still be affected by the inclusion of OPA projected spending in this area.
 - This presentation will further explain why most of the other adjustments are not material
 - Revised estimates from the IESO now also included

As of October 5th

2010 Interim Estimates:

**\$373.72 M/year with DER
and Transmission**

**\$ 166.65 M/year without
DER and Transmission**

As of September 7th

2010 Interim Estimates:

**\$352 M/year with DER and
Transmission**

**\$149 M/year without DER
and Transmission**

Detailed Summary of changes to the estimates since the last SGF meeting:

(all figures in \$ millions/year)

	As of September 7, 2010	As of October 12, 2010
Consumer Technologies	3.86	10.52
Distribution	133.91	141.76
Distributed Energy Resources	196.38	198.22
Transmission	6.36	8.86
Communications	8.08	8.84
Electric Vehicles	2.59	4.06
Innovation and the Economy	0.83	1.46
Totals:	352.01	373.72

- Among the challenges faced by the Working Group, was the application of a more rigorous definition of what constituted incremental smart grid capital costs.
 - **RECALL:** Working proposal confirmed at August 10th SGF meeting: definition of "Smart Grid costs" narrowed to include costs directly related to incremental smart grid functions not part of the utility's normal investment cycle.
- The application of this definition by the LDC working group members has largely met the spirit of the review by the SGF on September 7th

- Customer Technology:
 - Currently includes any LDC investment in CDM equipment that is not otherwise funded by the Ontario Power Authority or other public agencies.
 - Includes the cost of some demonstration projects
- Distribution:
 - Included components were already selected on the basis of avoiding outright expansion costs for the inclusion of distributed generation.
 - Inclusion of items such as monitoring, control, communications and processing equipment that lends “intelligence” to the grid.
 - Includes the cost of some demonstration projects

- Distributed energy resources:
 - Includes sub-transmission costs to connect resources under various OPA distributed generation programs
- Communications:
 - Includes all IT and communication hardware and software needed to enable the smart grid, but excludes communication components already embedded in other distribution equipment.

- Electric Vehicles:
 - Includes charging stations and related components but excludes distribution infrastructure and indirect communications component.
 - Includes pilot projects
- Innovation:
 - Immaterial amounts of LDC research funding
 - Estimates currently do not include funding from other public sector organizations. The Working Group recommends that these broader public expenditures be kept separate, in order to maintain consistency with the 2009 estimates of the Forum.

- The 2009 estimates were presented as an aggregate \$ M/year figure and will need to be shown again in such terms. However, are there other ways to present the data as well...
- Examples - \$ 359.2 M/year expressed in terms of:
 - \$/customer* per year: \$ 78.71
 - \$/customer* per month: \$ 6.56
 - \$ per kWh**: \$ 0.00314
 - % of average*** annual retail bill: 4.17%

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* Based upon 4.748 million retail customers as per 2009 OEB Distributors Yearbook

** Based upon 118,959,458,726 kWh sold to retail customers in 2009 as per 2009 OEB Distributors Yearbook

*** Based upon \$1888 average annual cost of power as per 2009 OEB Distributors Yearbook

The other side of the Ledger:

Smart Grid Benefits

- In addition to revising the 2009 smart grid cost estimates, the Working Group is turning its attention back to its original goal of connecting these costs with the broader societal benefits they are intended to enable.
- A foundational component of this exercise, is the 22 high-level smart grid principles that have been developed by the Forum...but how do these *principles* relate to specific *benefits*?

- The cross-reference exercise:
 - **Objective:** Map the Smart Grid Principles developed by the Forum to both tangible and intangible societal benefits of the Smart Grid
 - Draw on the notion of “benefits” of the smart grid already developed and available in the public domain through various sources such as:
 - McKinsey Consulting
 - U.S. Department of Energy
 - U.S. Energy Independence and Security Act of 2007

- Quantified Benefits from the McKinsey Article (*“U.S smart grid value at stake: the \$ 130 billion question”*) - U.S. projections for cumulative benefits by 2019:

Benefits yielded from...

Customer applications:	\$ 59 billion
AMI:	\$ 9 billion
Grid applications:	\$ 63 billion

TOTAL: **\$ 131 billion**

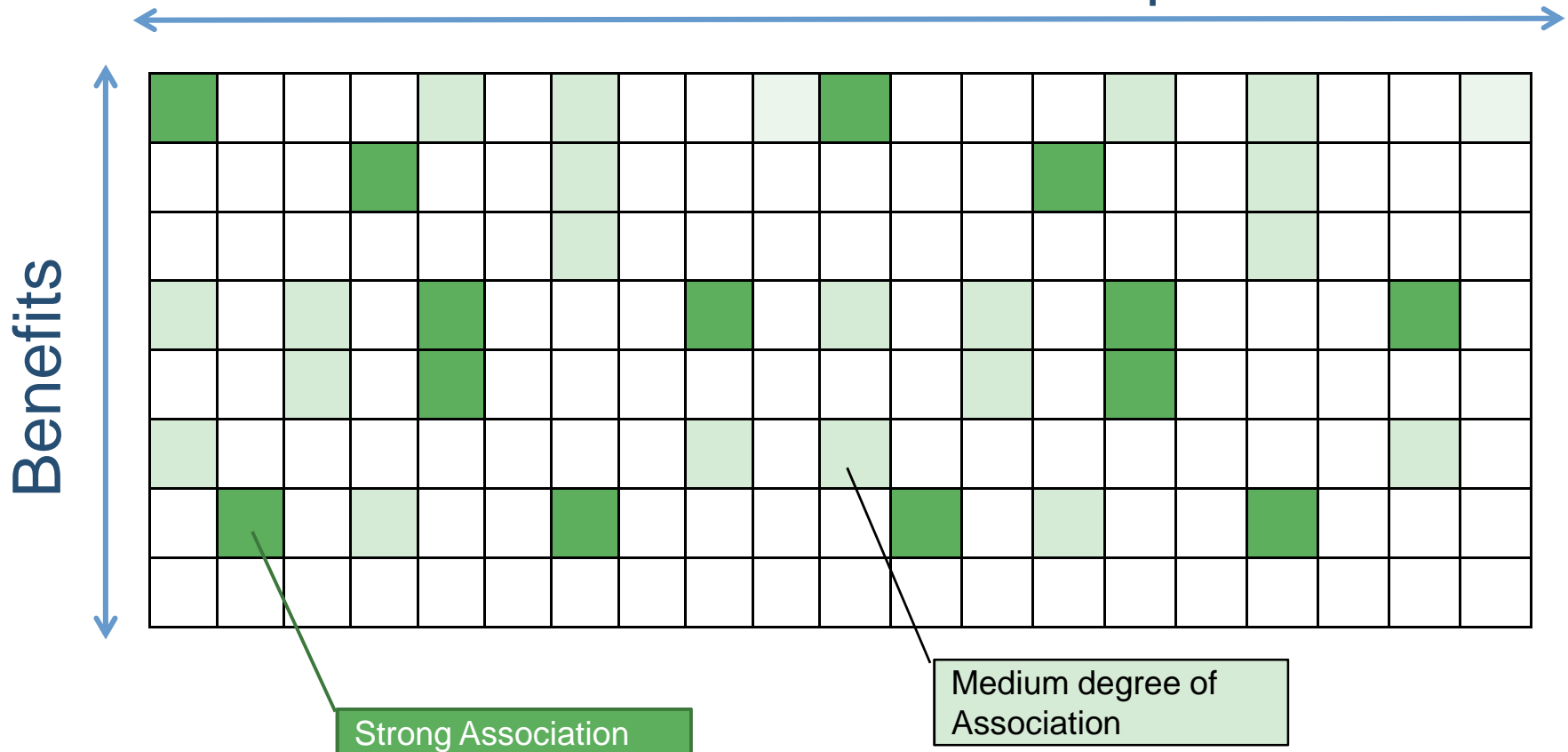
- Broader societal benefits cited in the U.S. Department of Energy guide, “*the SMART GRID: an introduction.*”:
 - “global competitiveness”
 - Greenhouse Gas emission reductions: direct and indirect
 - “Intelligent”
 - “Efficient”
 - “Motivating” – enabling real-time communication between the consumer and utility so consumers can tailor their energy consumption based on individual preferences, like price and/or environmental concerns
 - “Opportunistic” – creating new opportunities and markets by means of its ability to capitalize on plug-and-play innovation wherever and whenever appropriate
 - Quality-focused
 - Resilient

- *U.S. Energy Independence and Security Act of 2007*

Title XXIII benefit areas:

- (1) Increased use of digital information and controls technology.
- (2) Optimization of grid operations and resources, with full cyber-security.
- (3) Deployment and integration of distributed resources and generation, including renewable resources.
- (4) Incorporation of demand response, demand-side resources, and energy efficiency resources.
- (5) Deployment of `smart` technologies for metering, communications concerning grid operations and status, and distribution automation.
- (6) Integration of `smart` appliances and consumer devices.
- (7) Deployment and integration of advanced electricity storage and peakshaving technologies, including plug-in electric and hybrid electric vehicles, and thermal-storage air conditioning.
- (8) Provision to consumers of timely information and control options.
- (9) Development of standards for communication and interoperability of appliances and equipment connected to the electric grid.
- (10) The lowering of unreasonable or unnecessary barriers to adoption.

22 Ontario Smart Grid Principles



- **Do we have an adequate spectrum of smart grid benefits to draw from in order to support the Smart Grid principles ?**
 - Working Group Discussion and Analysis:
 - Job creation is a benefit area that should be considered beyond the U.S. groupings of benefits included in the paper
 - Ontario's principles tie into a broader set of benefits than just smart metering

- How do we make an adequate case for the Smart Grid based on the field of benefits?
 - Working Group Discussion and Analysis:
 - The Forum’s discussion of benefits (in various venues) should focus on a smaller number of high-value benefits – namely:
 - Lowering barriers to adoption
 - Operating resiliently against attack and natural disaster; (security-related)
 - Fault detection, isolation and restoration (FDIR) (reliability-related)
 - Continuous commissioning and proactive maintenance (reliability-related)
 - Enable active participation by consumers
 - Enabling new products, services and markets
 - Optimizing asset utilization and efficient operation
 - Avoided cost of capacity and reduced operation of inefficient peaking plants (relates to efficiency, CDM and customer value principles)
 - “Power quality for the digital age”
 - Avoid double-counting of benefits
 - Look at opportunity costs of not having a smart grid

- Are we sufficiently aligned with our southern neighbours? To what extent is such alignment necessary?
 - Working Group Discussion and Analysis:
 - Ontario should have a broader worldview than simply following developments and policies of the United States – particularly where other jurisdictions are currently leading in specific benefit areas.
 - Interaction with broader world will help avoid technological lock-in with obsolete or incompatible components.
 - Reliability and security standards is a critical area where Ontario will have no choice to be aligned with the U.S.

- Do the interaction of the smart grid principles and benefits highlight particular areas of strategic advantage to Ontario?
 - Working Group Discussion and Analysis:
 - **Access, Visibility and Customer Control** are all principles that tie into benefits where Ontario has gained an early advantage due to the Smart Metering Initiative. The “**customer value**” principle also has important interaction with these benefits as well.
 - “**Control and Automation**” principle and other principles under the Adaptive Infrastructure category also intersect with various benefits where Ontario has an advantage through initiatives under the *Green Energy Act*
 - Ontario is potentially ahead in its thinking with respect to the “**privacy**” principle, but “**security**” and area where Ontario may need to play a bit of a catch-up game.
 - “**Safety**” is potentially another area of natural advantage that warrants further investigation.

- Overall, do the benefits of the smart grid exceed the costs?
 - Working Group Discussion and Analysis:
 - Key focal points include: customer benefits, societal benefits, utility benefits. Out of these, the first two will inevitably demand the greatest priority from a public advocacy standpoint.
 - However, the Forum's challenge will be to keep the benefits discussion sufficiently broad, in order to avoid some of the experiences of the Smart Metering Initiative in which the public discourse gravitated to one particular benefit area to the detriment of the other benefits that the program yielded.

Q2, 2010	Q3, 2010	Q4, 2010	Q1, 2011
<p>Q2, 2010</p> <ul style="list-style-type: none"> •April 19 •May 17 •June 8 	<p>Q3, 2010</p> <ul style="list-style-type: none"> •July 13 - joint meeting with Corporate Partners Committee •August 10 •September 7 	<p>Q4, 2010</p> <p>Number of SGF meetings currently scheduled: 3</p> <ul style="list-style-type: none"> •October 12 •November 9 •December 7 	<p>Q1, 2011</p> <p>Publication of SGF 2010 Annual Report</p>
		<p>Currently Scheduled SGF WG meetings:</p> <p>Nov. 1, Nov. 29,</p>	



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Thank you.