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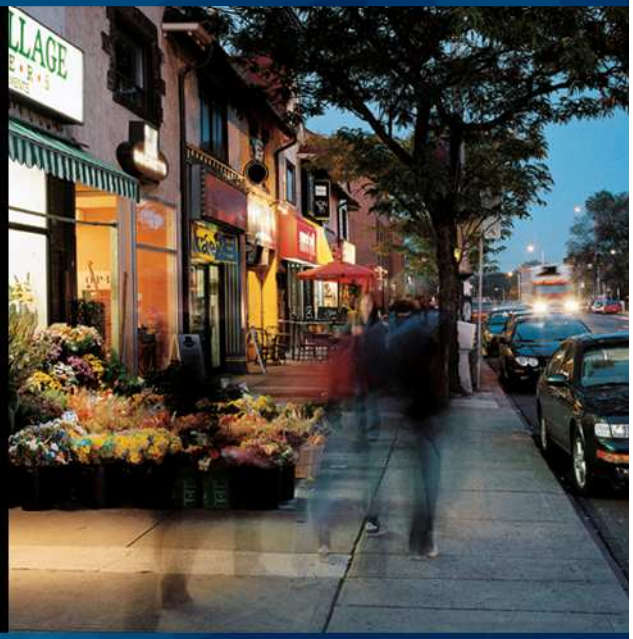
# Roles and Responsibilities in the context of Ontario's Smart Grid

Revisions from Ontario Smart Grid Forum WORKING GROUP

April 7th 2010



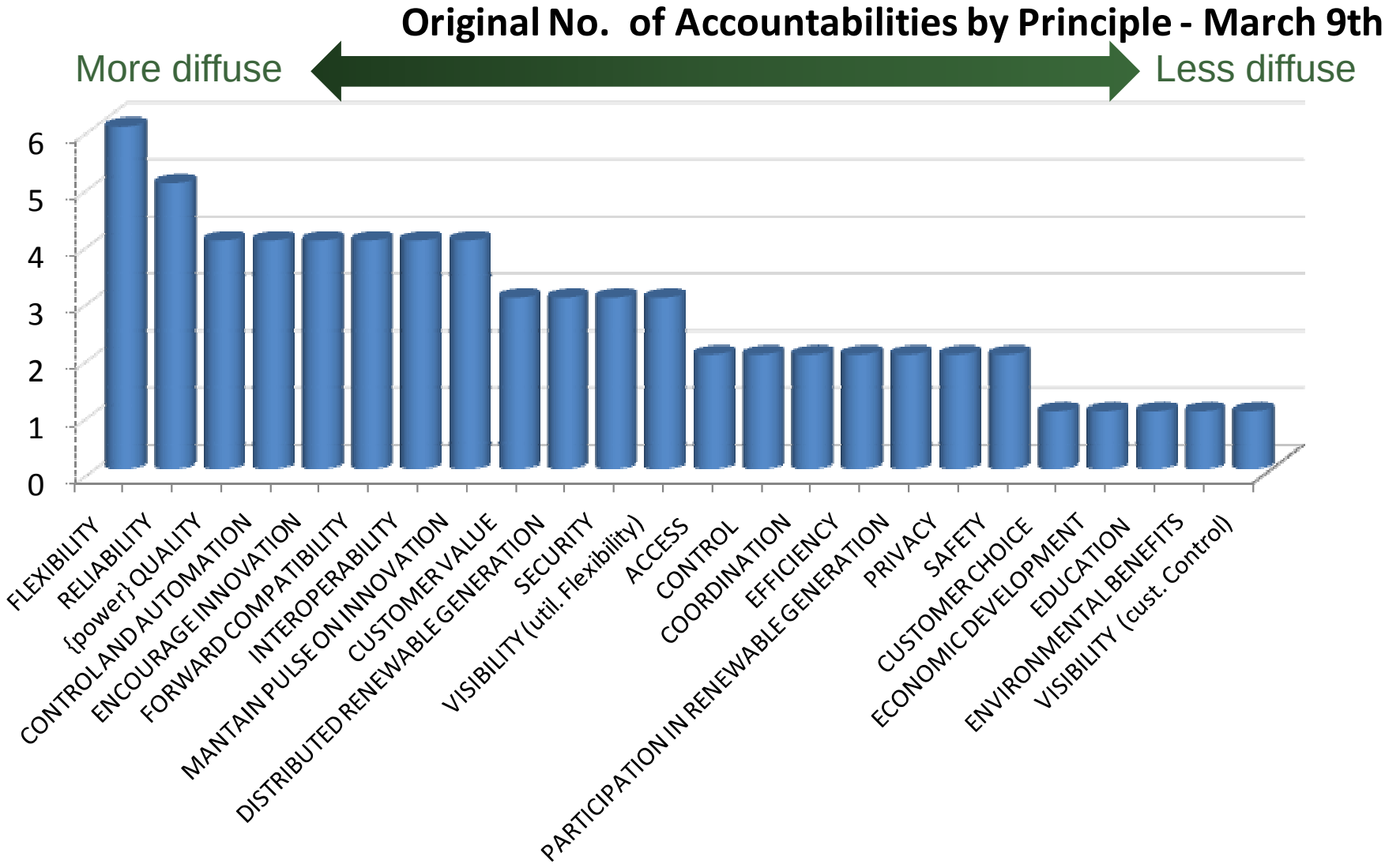
# Action items

- **Recall:** At the March 9th meeting of the Forum, two action items were assigned to the working group as follows:
  1. The SGF Working Group should identify those principles that are truly unique to the smart grid where new roles and responsibilities might need to be defined.
  2. The SGF Working Group should identify those principles where it feels that that accountabilities for that topic are too diffuse (based on the entries in the RACI matrix) and make recommendations as to how this might be rectified.

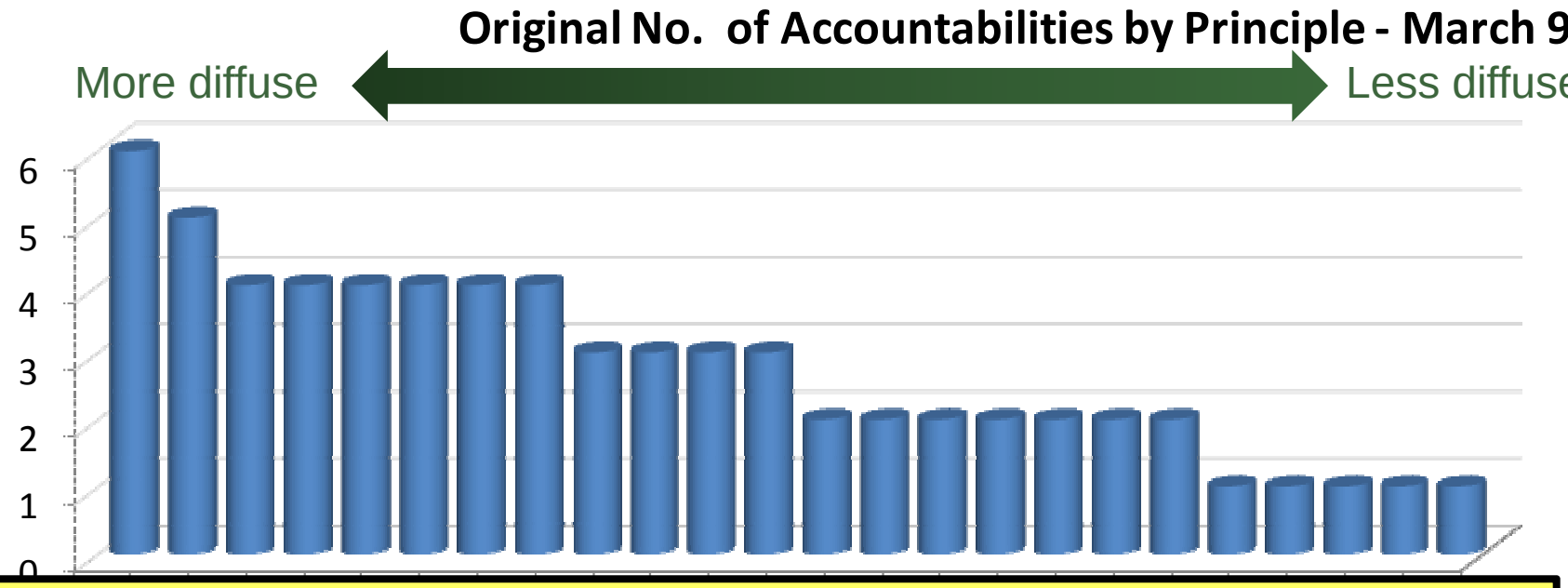
# Δ Delta Analysis

- Out of the 22 Smart Grid Principles the Working Group identified 17 that were truly “new” or “unique” to the topic of smart grids.
- In some cases this determination was made because the smart grid implicitly brings a new dimension or level of depth to an existing topic area.

# Diffusion of **Accountabilities** (as of March 9th)



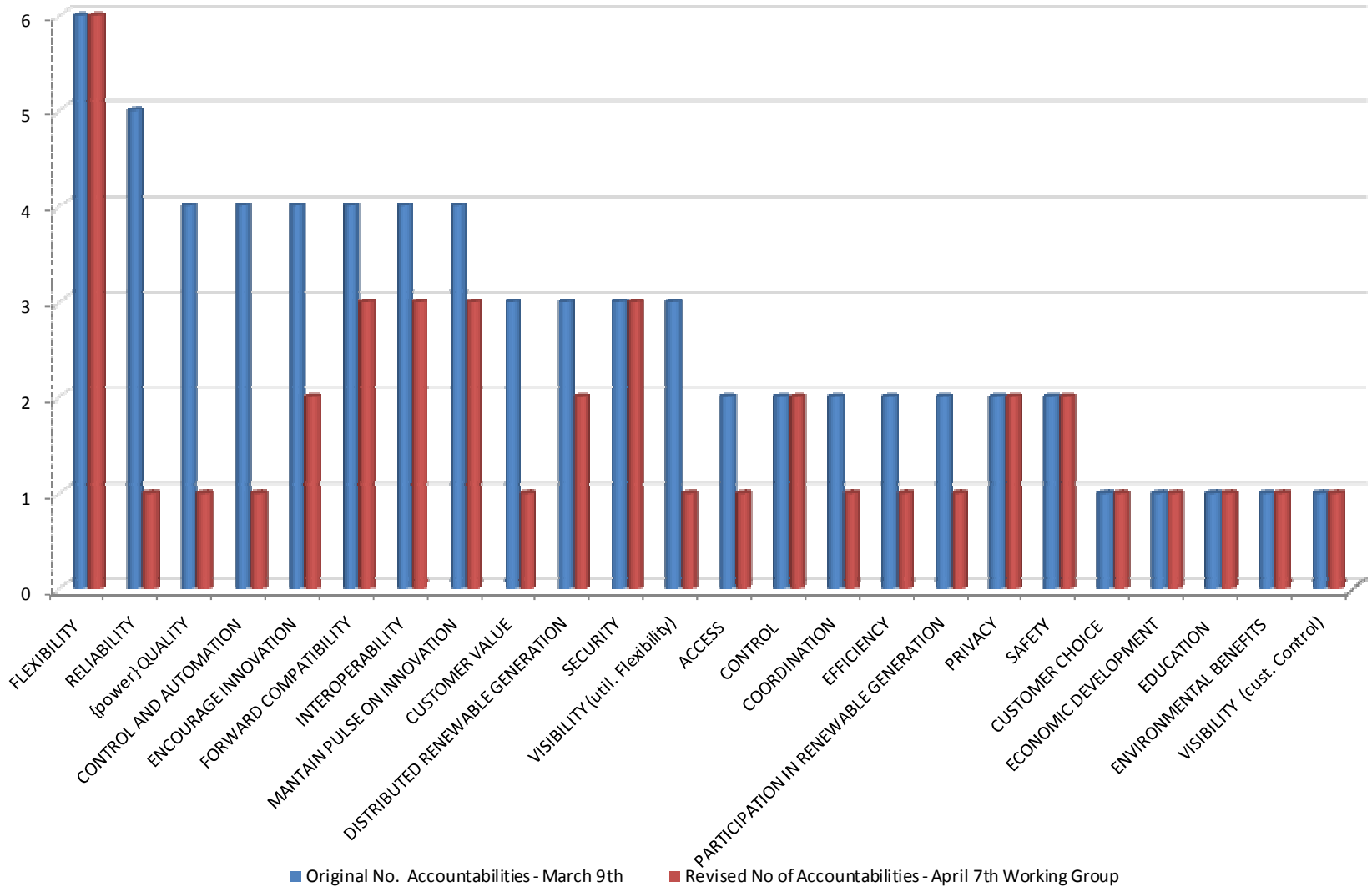
# Diffusion of **Accountabilities** (as of March 9th)




A key issue at the March 9th working group meeting was that some of the accountabilities for various smart grid principles were perhaps too diffuse.

# Reductions in number of accountable parties proposed by the Working Group

**Revised No. Of Accountabilities by Principle - April 7, 2010**



# Reductions in number of accountable parties proposed by the Working Group

| Principle | Original No. Accountabilities - March 9th | Revised No. of Accountabilities - April 7th Working Group | Delta Analysis: Does the smart grid bring a new dimension of accountability to this topic? |
|---|---|---|---|
| FLEXIBILITY (adaptive infrastructure) | 6 | 6 | New aspect of accountability |
| RELIABILITY | 5 | 1 | NOT a new Accountability |
| {power} QUALITY | 4 | 1 | NOT a new Accountability |
| CONTROL AND AUTOMATION | 4 | 1 | New aspect of accountability |
| ENCOURAGE INNOVATION | 4 | 2 | New aspect of accountability |
| FORWARD COMPATIBILITY | 4 | 3 | New aspect of accountability |
| INTEROPERABILITY | 4 | 3 | New aspect of accountability |
| MANTAIN PULSE ON INNOVATION | 4 | 3 | New aspect of accountability |
| CUSTOMER VALUE | 3 | 1 | NOT a new Accountability |
| DISTRIBUTED RENEWABLE GENERATION | 3 | 2 | NOT a new Accountability |
| SECURITY | 3 | 3 | New aspect of accountability |
| VISIBILITY (util. flexibility) | 3 | 1 | New aspect of accountability |
| ACCESS | 2 | 1 | New aspect of accountability |
| CONTROL | 2 | 2 | New aspect of accountability |
| COORDINATION | 2 | 1 | New aspect of accountability |
| EFFICIENCY | 2 | 1 | NOT a new Accountability |
| PARTICIPATION IN RENEWABLE GENERATION | 2 | 1 | New aspect of accountability |
| PRIVACY | 2 | 2 | NOT a new Accountability |
| SAFETY | 2 | 2 | NOT a new Accountability |
| CUSTOMER CHOICE | 1 | 1 | New aspect of accountability |
| ECONOMIC DEVELOPMENT | 1 | 1 | NOT a new Accountability |
| EDUCATION | 1 | 1 | New aspect of accountability |
| ENVIRONMENTAL BENEFITS | 1 | 1 | New aspect of accountability |
| VISIBILITY (cust. control) | 1 | 1 | New aspect of accountability |

# Diffusion of Accountability

The Working Group was able to identify a single, primarily-accountable party for 8 of the smart grid principles:

1. CUSTOMER VALUE
2. COORDINATION
3. EFFICIENCY
4. ACCESS
5. VISIBILITY
6. PARTICIPATION IN RENEWABLE GENERATION
7. CUSTOMER CHOICE
8. {power} QUALITY

...and possibly, RELIABILITY as well, with a minor wording change to the principle itself.

# Diffusion of Accountability

- The working group identified some principles where a relatively diffuse number of accountable parties (i.e. more than ~ 3 or 4) was perhaps appropriate.
  - The "FLEXIBILITY" principle within the "Adaptive Infrastructure" category was one example.

- In other cases, joint accountabilities between the federal and provincial governments were identified - particularly principles touching upon the topics of interoperability or innovation.

# APPENDIX

R.A.C.I. Matrix reflecting amendments and comments from the April 7th Working Group

# A summary of the situation so far

- Responsibilities, Accountabilities, Consulted, Informed ('RACI') matrix (see Appendix) now reflects input from:
  - SGF – Feb. 22nd
  - SGF Working Group – Mar. 2nd ; and
  - MEI Working Group – Mar. 5th
  - SGF Meeting – Mar. 9th
  - SGF Working Group – Apr. 7th

# Generic Roles and Responsibilities for Each Policy Area – '**R.A.C.I.**' Matrix

**RECALL: A 'R.A.C.I.' matrix assigns roles and responsibilities for each subject area in term of who is...**

- **'R' - Responsible:** Parties who are responsible for doing the work to achieve the policy goal.
- **'A' Accountable**: Parties who are accountable for achieving the policy goal and (usually) have decision making authority over the relevant policy itself.
- **'C' Consulted:** Parties that need to be consulted for the purposes of amending various aspects the framework (i.e. 2-way interaction).
- **'I' Informed:** Parties that need to be informed of various aspects of the framework.

***NOTE:** A given party can have <u>any combination</u> of the above roles in a given policy area.

# Revisions

- Revisions have been made to the R.A.C.I matrix Up to April 7th 2010.
- At the April 7th Working Group Meeting the following input was recorded:
  - **Δ Delta Analysis:** To what extent did the working group feel that this principle was truly new and unique to the topic of "smart grids"?
  - **Accountability Diffusion:** Was the working group able to identify a single organization with primary accountability for the principle, and if not, why?

# Broad Smart Grid Principles – cont'd

| "**CUSTOMER VALUE:** the smart grid must provide benefits to electricity customers." | | | | |
|---|---|---|---|---|
| | **Accountability** | **Responsibility** | **Consulted** | **Informed** |
| **CUSTOMER VALUE** | •Prosumers<br>•**OEB**<br>•LDCs | •Prosumers<br>•LDCs | •Prosumers | •Prosumers |
| **Δ Delta Analysis** | **•NOT a new topic or unique to smart girds** | | | |
| **Accountability Diffusion** | **•OEB likely has the primary accountability**<br>**•Not feasible to hold prosumers accountable** | | | |

| "**COORDINATION:** Smart grid implementation efforts should be coordinated by, among other means, coordinating smart grid plans among distributors, sharing information and results of pilot projects, and engaging in common procurements to achieve economies of scale." | | | | |
|---|---|---|---|---|
| | **Accountability** | **Responsibility** | **Consulted** | **Informed** |
| **COORDINATION** | •Ontario Government<br>•**OEB** | •LDCs<br>•**OPA** | •??? | •??? |
| **Δ Delta Analysis** | **•Smart Grid brings a new aspect of accountability.** | | | |
| **Accountability Diffusion** | **•OEB likely has the primary accountability – but is there also a need for a more formalized coordination framework?** | | | |

# Broad Smart Grid Principles – cont'd

**INTEROPERABILITY:** Adopt recognized industry standards that support the exchange of meaningful and actionable information between and among smart grid systems and enable common protocols for operation. Where no standards exist, support the development of new recognized standards.

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| INTEROPERABILITY | •OEB<br>•Federal Government<br>•Ontario Government<br>~~•LDCs~~ | •Standards Organizations<br>•Service Providers<br>•LDCs<br>•OPA<br>•Transmitters<br>•Generators<br>•IESO | ??? | ??? |
| **Δ Delta Analysis** | **•Smart Grid brings a new aspect of accountability.** | | | |
| **Accountability Diffusion** | **•Interoperability framework is an international, national an provincial issue, making it difficult to assign a single, primary accountable party.** | | | |

# Broad Smart Grid Principles – cont'd

**SECURITY:** Ensure both cybersecurity and physical security to protect data, access points, and the overall electricity grid from unauthorized access and malicious attacks.

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| SECURITY | •Standards Organizations<br>•Ontario Government<br>•Law enforcement and security services | •Service Providers<br>•LDCs<br>•Transmitters<br>•Generators<br>•IESO<br>•OEB<br>•Law enforcement and security services | ??? | ??? |
| **Δ Delta Analysis** | **•Smart Grid brings a new aspect of accountability.** | | | |
| **Accountability Diffusion** | **•Current list is appropriate<br>•Cannot assign a single accountability in this area** | | | |

# Broad Smart Grid Principles – cont'd

| PRIVACY: respect and protect the privacy of customers. Integrate privacy requirements into smart grid planning and design from an early stage. | | | | |
|---|---|---|---|---|
| | **Accountability** | **Responsibility** | **Consulted** | **Informed** |
| PRIVACY | •Ontario Government<br>•OEB | •Service Providers<br>•LDCs<br>•Transmitters<br>•Generators<br>•IESO | •Prosumers<br>•Privacy Commissioner | •Prosumers |
| **Δ Delta Analysis** | **•NOT a new topic or unique to smart girds.** | | | |
| **Accountability Diffusion** | **•Current list is appropriate<br>•Cannot assign a single accountability in this area** | | | |

# Broad Smart Grid Principles – cont'd

**SAFETY:** Under all circumstances maintain, and in no way compromise, health and safety protections and improve electrical safety wherever practical.

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| SAFETY | •ESA<br>•Ontario Government (Min. Of Labour) | •LDCs<br>•Transmitters<br>•Service Providers<br>•Generators | •LDCs<br>•Transmitters<br>•Service Providers<br>•Generators | •Prosumers<br>•??? |
| **Δ Delta Analysis** | **•NOT a new topic or unique to smart girds.** | | | |
| **Accountability Diffusion** | **•Current list is appropriate**<br>**•Cannot assign a single accountability in this area** | | | |

# Broad Smart Grid Principles – cont'd

**ECONOMIC DEVELOPMENT:** encourage economic growth and job creation within the province of Ontario. Actively encourage the development and adoption of smart grid products, services, and innovative solutions from Ontario-based sources.

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| ECONOMIC DEVELOPMENT | •Ontario Government | •OCE<br>•Ontario Government<br>•Ministry of Transport | ??? | ??? |
| **Δ Delta Analysis** | **•NOT a new topic or unique to smart girds.** | | | |
| **Accountability Diffusion** | **•Current accountability is appropriate** | | | |

# Broad Smart Grid Principles – cont'd

**ENVIRONMENTAL BENEFITS:** Promote the integration of clean technologies, conservation, and more efficient use of existing technologies to reduce the environmental footprint of the electricity and transportation sectors

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| ENVIRONMENTAL BENEFITS | •Ontario Government | •LDCs<br>•Manufacturers<br>•OPA | ??? | ??? |
| **Δ Delta Analysis** | **•Smart Grid brings a new aspect of accountability.** | | | |
| **Accountability Diffusion** | **•Current accountability is appropriate** | | | |

**EFFICIENCY:** Improve efficiency of grid operation, taking into account the cost-effectiveness of the electricity system.

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| EFFICIENCY | •Ontario Government<br>•**OEB** | •LDCs<br>•Transmitters<br>•IESO | ??? | ??? |
| **Δ Delta Analysis** | **•NOT a new topic or unique to smart girds.** | | | |
| **Accountability Diffusion** | **•OEB likely has the primary accountability** | | | |

# Broad Smart Grid Principles – cont'd

**RELIABILITY:** Maintain reliability of the electricity grid and improve it wherever practical, including reducing the impact, frequency and duration of outages.

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| RELIABILITY | •IESO<br>~~•LDC~~<br>~~•Transmitters~~<br>•**OEB**<br>~~•ESA~~ | •IESO<br>•LDCs<br>•Transmitters<br>•OEB<br>•ESA | •IESO<br>•LDCs<br>•Transmitters<br>•Generators<br>•Prosumers | •IESO<br>•LDCs<br>•Transmitters<br>•Generators<br>•Prosumers |
| **Δ Delta Analysis** | **•NOT a new topic or unique to smart girds.** | | | |
| **Accountability Diffusion** | **•OEB can only have primary accountability if this principle is aimed at "ensuring" reliability - not, "maintaining" it as currently drafted.** | | | |

# Customer Control

**ACCESS:** Enable access to data by authorized parties who can provide customer value and enhance a customer's ability to manage consumption and home energy systems.

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| ACCESS | •OEB<br>•Ontario Government | •LDCs<br>•Retailers<br>•Service Providers<br>•IESO<br>•Smart Metering Entity<br>•Transmitters<br>•Generators | •LDCs<br>•Retailers<br>•Service Providers<br>•IESO<br>•Smart Metering Entity<br>•Privacy Commissioner | •Manufacturers |
| **Δ Delta Analysis** | **•Smart Grid brings a new aspect of accountability.** | | | |
| **Accountability Diffusion** | **•OEB can only have primary accountability** | | | |

# Customer Control - cont'd

**VISIBILITY:** Improve visibility of information, to and by customers, that can benefit the customer and the electricity system, such as electricity consumption, generation characteristics, and commodity price.

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| VISIBILITY | ~~Prosumers~~ **Marketplace** | •LDCs<br>•Retailers<br>•Service Providers<br>•OPA | •Prosumers<br>•LDCs | •Prosumers<br>•Manufacturers |
| **Δ Delta Analysis** | **•Smart Grid brings a new aspect of accountability.** | | | |
| **Accountability Diffusion** | **•The marketplace is the mechanism by which an appropriate level of visibility would be supplied.**<br>**•Prosumers can't be held accountable as they don't set the ground rules here.** | | | |

# Customer Control – cont'd.

**CONTROL:** Enable consumers to better control their consumption of electricity in order to facilitate active, simple, and consumer-friendly participation in conservation and load management.

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| CONTROL | •Prosumers<br>•OEB | •Service Providers<br>•LDCs<br>•OPA<br>•IESO | •Prosumers | •Prosumers<br>•Manufacturers |
| **Δ Delta Analysis** | **•Smart Grid brings a new aspect of accountability.** | | | |
| **Accountability Diffusion** | **•Current accountability is appropriate** | | | |

# Customer Control – cont'd.

**PARTICIPATION IN RENEWABLE GENERATION:** provide consumers with opportunities to provide services back to the electricity grid such as small-scale renewable generation and storage.

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| PARTICIPATION IN RENEWABLE GENERATION | •OPA<br>•Ontario Government | •IESO<br>•OPA<br>•LDCs<br>•Prosumers<br>•Transmitters<br>•Ontario Government | •IESO<br>•OPA<br>•LDCs<br>•Prosumers | •Prosumers<br>•Manufacturers |
| **Δ Delta Analysis** | **•Smart Grid brings a new aspect of accountability.** | | | |
| **Accountability Diffusion** | **•OPA should hold primary accountability in this area, but the Ontario government still remains accountable as well.** | | | |

# Customer Control – cont'd.

**CUSTOMER CHOICE:** enable improved channels through which customers can interact with electricity service providers, and enable more customer choice.

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| CUSTOMER CHOICE | ~~Prosumers~~ **Marketplace** | •Service Providers<br>•LDCs<br>•Retailers<br>•Manufacturers | •Prosumers | •Prosumers<br>•Manufacturers |
| **Δ Delta Analysis** | **•Smart Grid brings a new aspect of accountability.** | | | |
| **Accountability Diffusion** | **•As with "CONTROL," accountabilities are diffuse in this topic area and therefore the marketplace is the appropriate mechanism.** | | | |

# Customer Control – cont'd.

**EDUCATION: Actively educate consumers about opportunities for their involvement in generation and conservation associated with a smarter grid, and present customers with easily understood material that explains how to increase their participation in the smart grid and the benefits thereof.**

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| EDUCATION | •Ontario Government<br>•OEB | •LDCs<br>•Service Providers<br>•Manufacturers<br>•Prosumers<br>•OPA<br>•Education System | •??? | Prosumers |
| **Δ Delta Analysis** | **•Smart Grid brings a new aspect of accountability.** | | | |
| **Accountability Diffusion** | **•OEB and the Ontario Government hold joint accountability over this topic area.** | | | |

# Utility Flexibility

**DISTRIBUTED RENEWABLE GENERATION:** enable a flexible distribution system infrastructure that promotes increased levels of distributed renewable generation.

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| DISTRIBUTED RENEWABLE GENERATION | •OPA<br>•~~Ontario Government~~<br>•OEB | •IESO<br>•OPA<br>•LDCs<br>•Generators<br>•OEB<br>•ESA<br>•Transmitters | •IESO<br>•OPA<br>•LDCs<br>•Generators<br>•Prosumers | •Prosumers |
| **Δ Delta Analysis** | **•Smart Grid brings a new aspect of accountability.** | | | |
| **Accountability Diffusion** | **•OEB and the OPA hold joint accountability over this topic area.** | | | |

# Utility Flexibility

**VISIBILITY:** Improve network visibility of grid conditions for grid operations where a demonstrated need exists or will exist, including the siting and operating of distributed renewable generation.

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| VISIBILITY | ~~•OPA~~<br>~~•Ontario Government~~<br>•**OEB**<br>•IESO | •LDCs<br>•IESO<br>•OEB<br>•Transmitters<br>•**OPA** | •Prosumers<br>•Service Providers | •Prosumers<br>•Service Providers |
| **Δ Delta Analysis** | **•Smart Grid brings a new aspect of accountability.** | | | |
| **Accountability Diffusion** | **•OEB should have primary accountability over this topic area.** | | | |

# Utility Flexibility – cont'd

**CONTROL AND AUTOMATION –** Enable improved control and automation on the electricity grid where needed to promote distributed renewable generation. To the extent practical, move toward distribution automation such as a self-healing grid infrastructure to automatically anticipate and respond to system disturbances for faster restoration.

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| CONTROL AND AUTOMATION | •**OEB**<br>~~•LDCs~~<br>•IESO<br>~~•Transmitters~~ | •LDCs<br>•IESO<br>•Transmitters<br>•Service Providers<br>•OEB | •Prosumers<br>•Service Providers | •Prosumers<br>•Service Providers |
| **Δ Delta Analysis** | **•Smart Grid brings a new aspect of accountability.** | | | |
| **Accountability Diffusion** | **•OEB should have primary accountability over this topic area.** | | | |

# Utility Flexibility – cont'd

| **QUALITY:** Maintain the quality of power delivered by the grid, and improve it wherever practical. | | | | |
|---|---|---|---|---|
| | **Accountability** | **Responsibility** | **Consulted** | **Informed** |
| {power} QUALITY | •OEB<br>~~•LDCs~~<br>~~•Transmitters~~ | •LDCs<br>•Transmitters<br>•Prosumers<br>•Generatorrs<br>•Service Providers | •Prosumers<br>•Manufacturers | •Prosumers |
| **Δ Delta Analysis** | **•NOT a new topic or unique to smart girds.** | | | |
| **Accountability Diffusion** | **•OEB can only have primary accountability if this principle is aimed at "ensuring" reliability - not, "maintaining" it as currently drafted.** | | | |

# Adaptive Infrastructure

**FLEXIBILITY –** provide flexibility within smart grid implementation to support future innovative applications, such as electric vehicles and energy storage.

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| FLEXIBILITY | •Ontario Government<br>•OPA<br>•OEB<br>•IESO<br>•LDCs<br>•Transmitters | •LDCs<br>•Transmitters<br>•IESO<br>•OPA<br>•Service Providers | •Service Providers<br>•Manufacturers<br>•Research and Development organizations | •??? |
| **Δ Delta Analysis** | **•Smart Grid brings a new aspect of accountability.** | | | |
| **Accountability Diffusion** | **•Current accountability list is appropriate**<br>**•This principle is inherently a diffuse accountability shared by many organizations.** | | | |

# Adaptive Infrastructure

**FORWARD COMPATIBILITY –** protect against technology lock-in to minimize stranded assets and investments and incorporate principles of modularity, scalability and extensibility into smart grid planning.

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| FORWARD COMPATIBILITY | •OEB<br>•Federal Government<br>•Ontario Government<br>~~•LDCs~~ | •LDCs<br>•Transmitters<br>•IESO<br>•Service Providers<br>•Standards Organizations | •Manufacturers | ??? |
| **Δ Delta Analysis** | **•Smart Grid brings a new aspect of accountability.** | | | |
| **Accountability Diffusion** | **•Current accountability list is appropriate, although LDCs are more of a responsible party in this area. The biggest safeguards in this area lie within apriority standards development and adoption.**<br>**•This principle is inherently a diffuse accountability shared by many organizations.** | | | |

# Adaptive Infrastructure

**ENCOURAGE INNOVATION –** Nest within smart grid infrastructure planning and development the ability to adapt to and actively encourage innovation in technologies, energy services and investment / business models.

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| ENCOURAGE INNOVATION | •**Ontario Government**<br>•**Federal Government**<br>•OCE<br>~~•LDCs~~<br>~~•Transmitters~~<br>•OPA* | •Ontario Government<br>•OCE<br>•Federal Government<br>•Academia<br>•OEB<br>•LDCs<br>•Transmitters | •Manufacturers<br>•Academia<br>•Industry Associations<br>•Research and Development organizations | ??? |
| **Δ Delta Analysis** | **•Smart Grid brings a new aspect of accountability.** | | | |
| **Accountability Diffusion** | **•Federal and Provincial Government hold joint accountability over this topic area.** | | | |



* Addition suggested following April 7th working group.

# Adaptive Infrastructure

**MAINTAIN PULSE ON INNOVATION –** encourage information sharing, relating to innovation and the smart grid, and ensure Ontario is aware of best practices and innovations in Canada and around the world.

| | Accountability | Responsibility | Consulted | Informed |
|---|---|---|---|---|
| MANTAIN PULSE ON INNOVATION | •Ontario Government<br>•Federal Government<br>~~•LDCs~~<br>~~•Transmitters~~<br>•OPA* | •Ontario Government<br>•OCE<br>•Federal Government<br>•LDCs<br>•Transmitters<br>•OEB | •Manufacturers<br>•Academia<br>•Industry Associations<br>•Research and Development organizations | •Standards Organizations |
| **Δ Delta Analysis** | **•Smart Grid brings a new aspect of accountability.** | | | |
| **Accountability Diffusion** | **•Federal and Provincial Government hold joint accountability over this topic area.**<br><br>**•Question for Forum: What is the role of the LDCs Transmitter and OEB in this area. All have a potential role to play if they are seen as actively monitoring developments and influencing requirements specifications for new technologies.** | | | |



* Addition suggested following April 7th working group.

# Thank you.