Issues, Challenges and opportunities 1

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Introduction

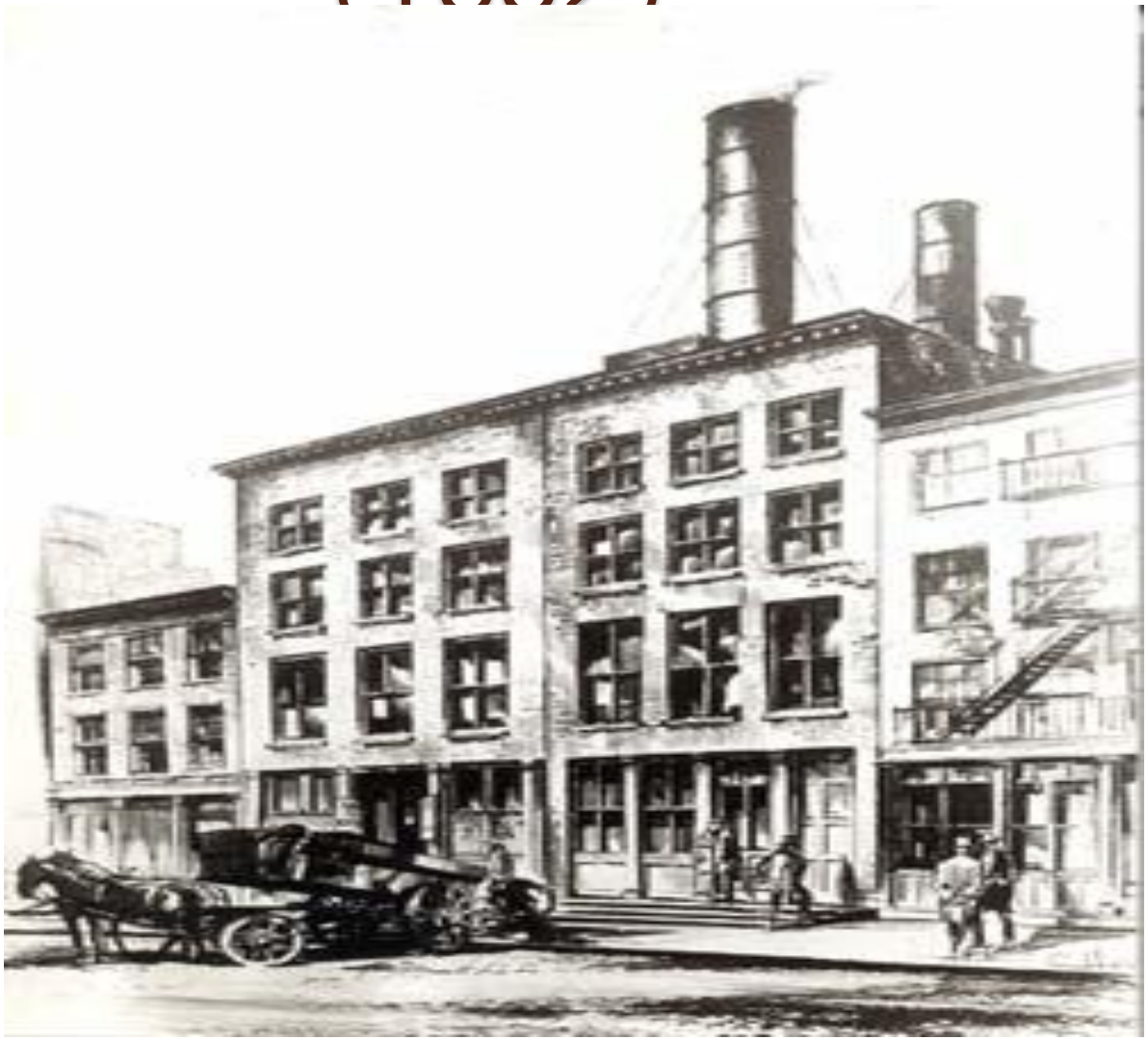
What are we talking about?

- Competition
- Deregulation
- Restructuring
- Liberalization
- Unbundling
- De-integration
- Reform

The backdrop

- **The system being restructured:**
  - The vertically Integrated energy systems with centralized ownership of the entire supply chain of generation, transmission, distribution, retail sales and services.
- **Rationale and motivation for the existing system:**
  - Economies of scale and natural monopolies
- **The regulatory compact**
  - Unwritten understanding of rights and obligations of.
- **Risk of costs overrun**
  - under this system are born by the utility's consumers subject to prudence review.

Where it all began: Pearl Street Generating Station (1882)



The Alternative System

- In the late 1980's – mid 1990's governments began to consider creating an alternate system by restructuring the existing system.
- Some of the underlying factors for this development were:
  - Technology development made decentralized generation more efficient and economically appealing. Large consumers could generate power or buy it over the fence for far less than their retail utility prices. The era of natural monopoly in generation seemed to had come to an end.
  - Relatively high retail prices in some regions lead to consideration of opening generation to competition as a path to lowering prices.
  - The relative success of introducing competition in other industries, the telecom, airlines, trucking and natural gas spurred interest in replicating the results in the electricity sector.

Features of the Alternate System

Restructuring efforts have spread to many jurisdictions across the globe. Reflecting variations in social, political and economic environments in various economies, these efforts produced a mix of restructuring models that differed in various aspects.

- While the existing systems had more or less similar structures across jurisdictions (a regulated, vertically integrated utility) the alternate systems that emerged varied among restructuring jurisdictions.
- A common feature of the new structures is unbundling the generation and wires (Transmission and distribution) businesses.
- Unlike the generation segment of the existing system which has lost natural monopoly status, the wires segment retained its natural monopoly characteristics.
- Ownership and operational control of the transmission are separated. To facilitate competition in generation access to transmission needed to be open and non-discriminatory.
- Regional Transmission Organizations (RTO's) and Independent System Operators (ISO's) were introduced into electricity markets to manage access and coordinate generation to maintain reliability and system stability.

Challenges and Opportunities

- Introducing change into long established systems (such as the existing electricity system), even with the most careful planning, inevitably would lead to the emergence of unanticipated consequences, events and market conditions.
- To be effective, a restructured system should be capable of responding to the challenges and capturing the opportunities that

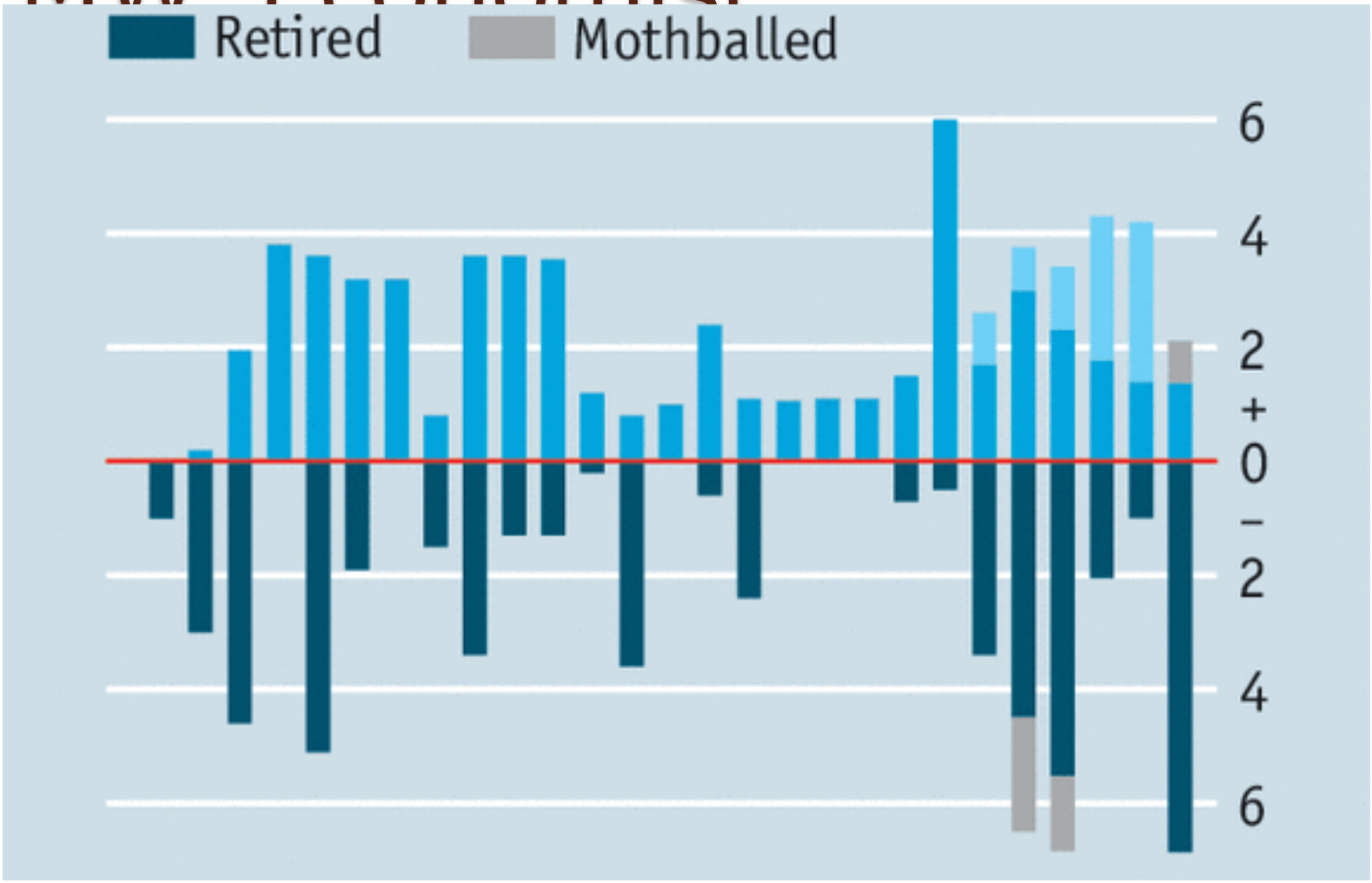
Challenges

- The major challenge of restructuring is to successfully balance the public interest and reliance on competitive markets. There are areas where the two are not always compatible.
- Some aspects of the electricity market exhibit public goods characteristics that lead to market failure to adequately provide them.
- Connecting wholesale and retail markets remains an important challenge.

Resource adequacy and reliability

- Price caps: missing the correct cap leads to over-or-under investment
- Regulatory uncertainty: price volatility could lead to political intervention to impose cap or lower it
- Costly and protracted permitting process reduces investment response time
- Risk aversion
- Unpriced public good of system reliability: both increasing capacity and reducing loads carry public good characteristics: no-exclusionary and non-rival.
- Energy-only electricity markets more likely to lead to a shortfall of generation capacity over time, possibly resulting cyclical

Britain, electricity generating capacity '000 MW, Economist



Energy Mix

- The existence of externalities and public goods precludes complete reliance on markets to achieve socially optimal outcomes.
- Barring government intervention the energy mix yielded by competitive markets will gravitate towards least costly options within the existing environmental constraints.
- The relative movement of fuel prices has a direct influence of fuel and technology choices Low carbon technology development almost everywhere was aided by government intervention through a mix of policy commitments, regulation (RPS, FIT), and fiscal tools(taxes and subsidies)
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Environmental Impacts

- To the extent that restructuring achieves the goal of lower energy prices it could lead to increased consumption thus raising emissions.
- An energy system's impacts on the environment are more a function of environmental policy, rules and regulations than the market structure per se.
- As measured by air emissions, environmental impacts of a restructured system are directly

Energy efficiency and DSM

- In a restructured market measures to reduce consumption or shift it are not very compatible with the desire to increase sales and revenues.
- Have elements of public goods, will be underprovided by free markets
- In some jurisdictions efficiency and DSM programs decreased substantially at the onset of restructuring. Utility programs in these areas were in response to regulatory directions and put utilities at a disadvantage in a competitive market.
- Restored by non-bypassable charge on distribution

R&D, Renewables Development and Low income Access

- Recognizing the weakness of competitive markets to adequately provide these quasi public goods, some restructuring jurisdictions intervened to enhance their provision
- A charge on bills of all consumers to fund these activities was imposed.
- This was combined in some systems with regulatory obligations (RPS, FIT) and fiscal

Market Power

- Market power refers to a supplier's ability to influence market price by altering its output.
- Incentives exist for producers to restrict output which raises price when market power exists
- Market oversight needed to prevent or minimize the exercise of market power through market gaming.

Stranded Costs

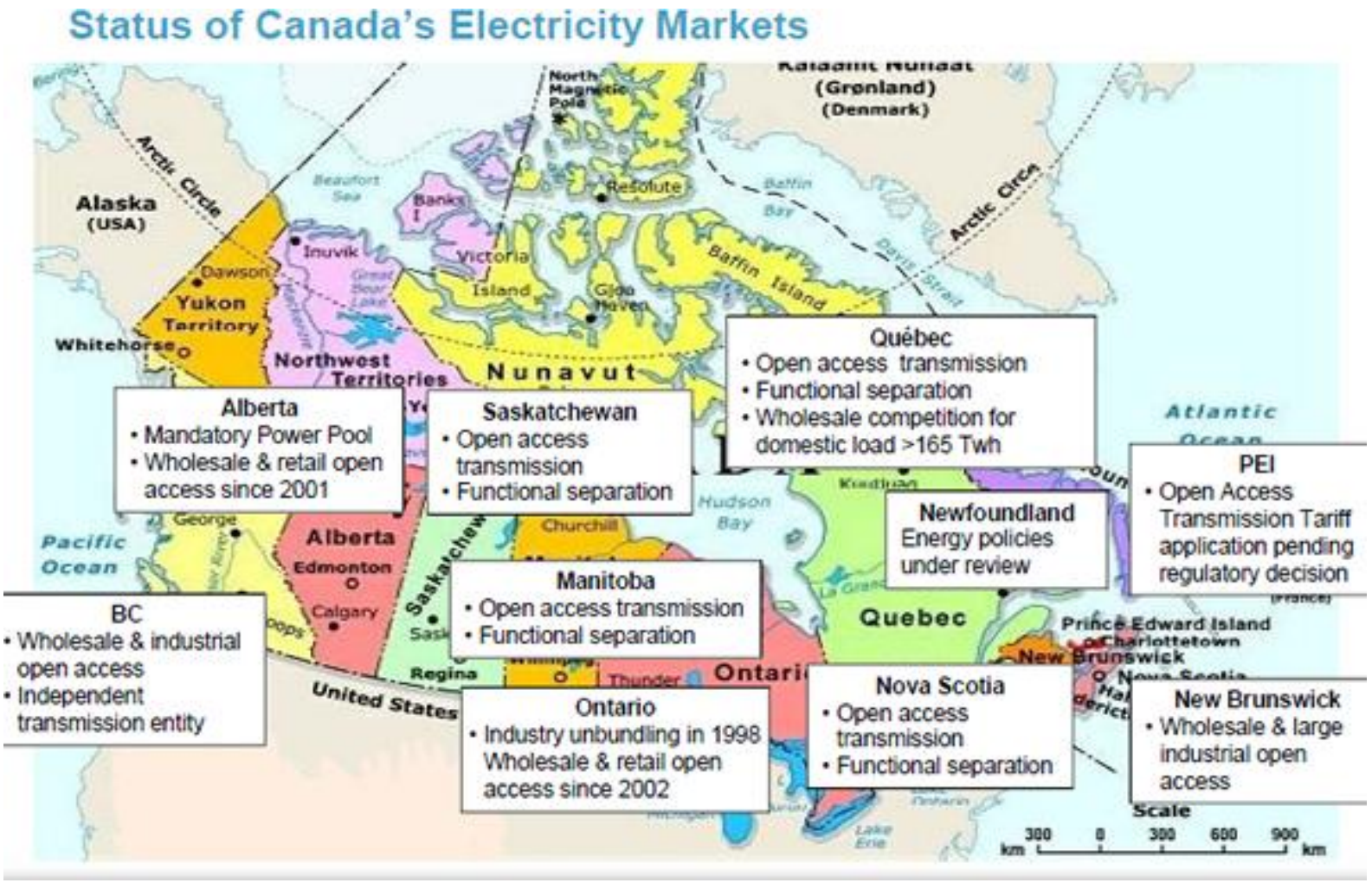
- In the existing system prices are set by the regulator to cover a utility's fixed and variable costs including a fair return on capital expenditure
- In the alternative system that emerges from restructuring existing system, pieces (specially for generation) are determined largely by market forces
- Market prices in the alternative system may not cover the cost of all the utility's costs and obligations leading to stranded costs

Opportunities

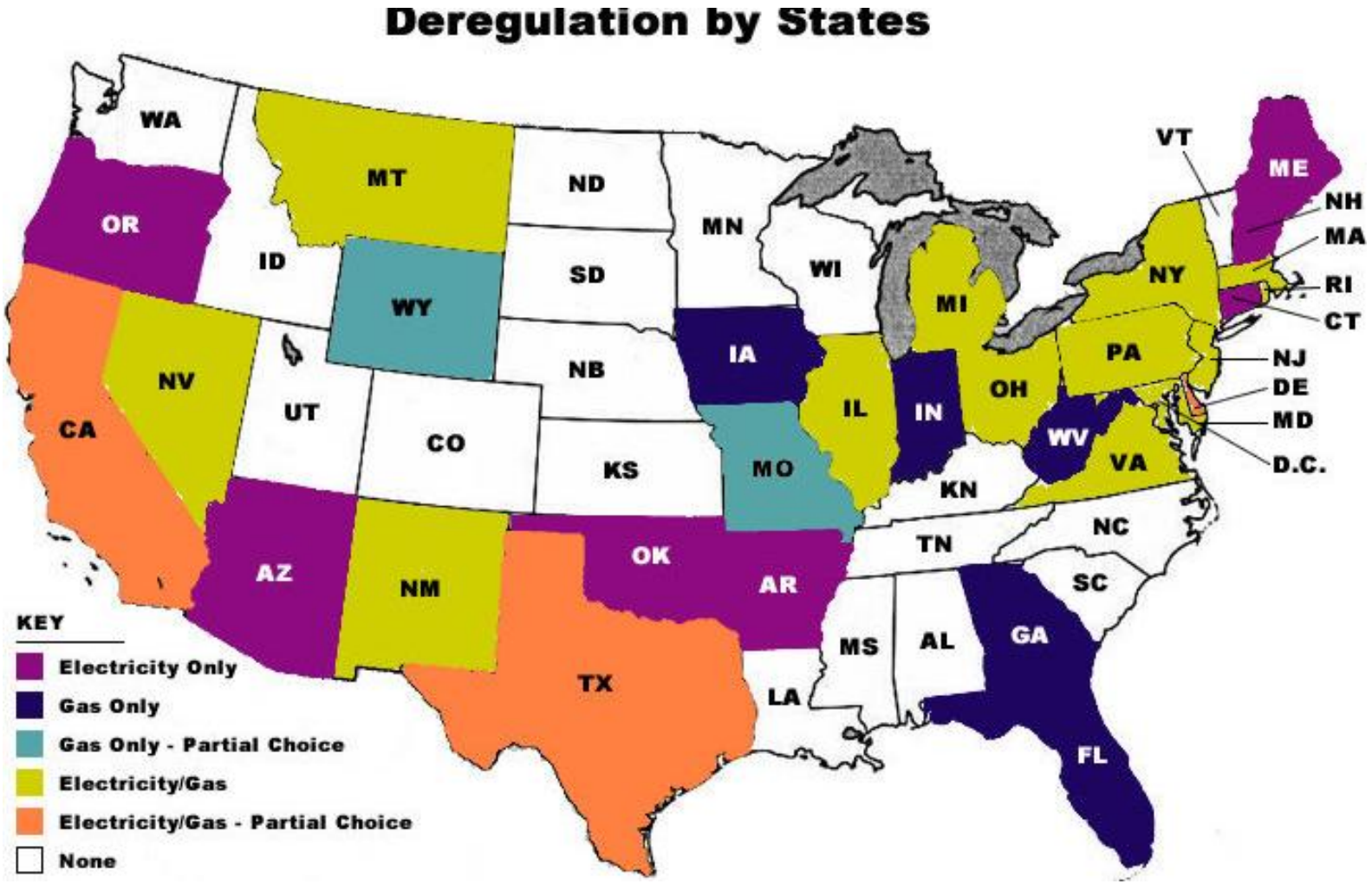
The main driver of restructuring has been the anticipation of several positive outcomes:

- Lower consumer prices
- Prices better reflect and quicker to respond to fuel costs.
- Innovation
- Consumer choice
- Improved services
- Improved efficiency

Canadian Restructuring Status



US Restructuring Status



Concluding Remarks: To Restructure Or Not

- The restructuring movement to bring revolutionary changes to the electricity markets has been taking place in many parts of the world since the late 1980's
- There's been some backlash from the botched California experience. The momentum has slowed down considerably since 2001. Some jurisdictions have halted the move or even reverse it (re-regulation).
- Important to keep in mind that restructuring is not an event but rather a continuous process of change and adaptation. Expecting a beginning an end to the restructuring process within a specified period is likely to yield disappointment
- Restructuring models designed to fit a jurisdictions' specific environment, geopolitical and socio-economic conditions lkely to be more successful than an imported one.
- "If it ain't broke don't fix it". A question of why restructure needs to be asked before embarking on restructuring: what is the problem or problems? Is restructuring the sector the best way to address the problem? Are the designs and tools proposed suitable to the problem?
- A restructured system designed to be flexible will be more capable of responding to changing market conditions and unanticipated events.