
Sustainable Electricity in Canada

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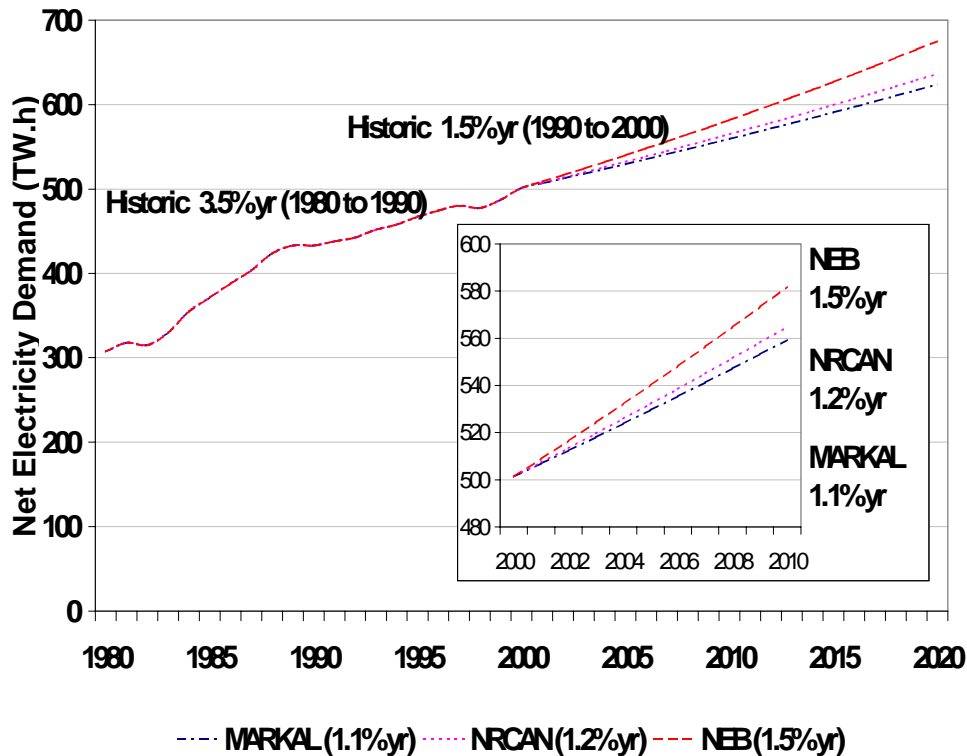


Overview

- Reliable, safe, accessible, essential service
 - Infrastructure developed with economy over past century
 - Core component of Canadian economy
 - Integral to new thrusts in economy, like information technology and communications
- Facing a paradigm shift – Restructuring and increasing environmental pressures. Industry is striving to position itself to meet these challenges for a sustainable electricity future.



Cdn Electricity Demand

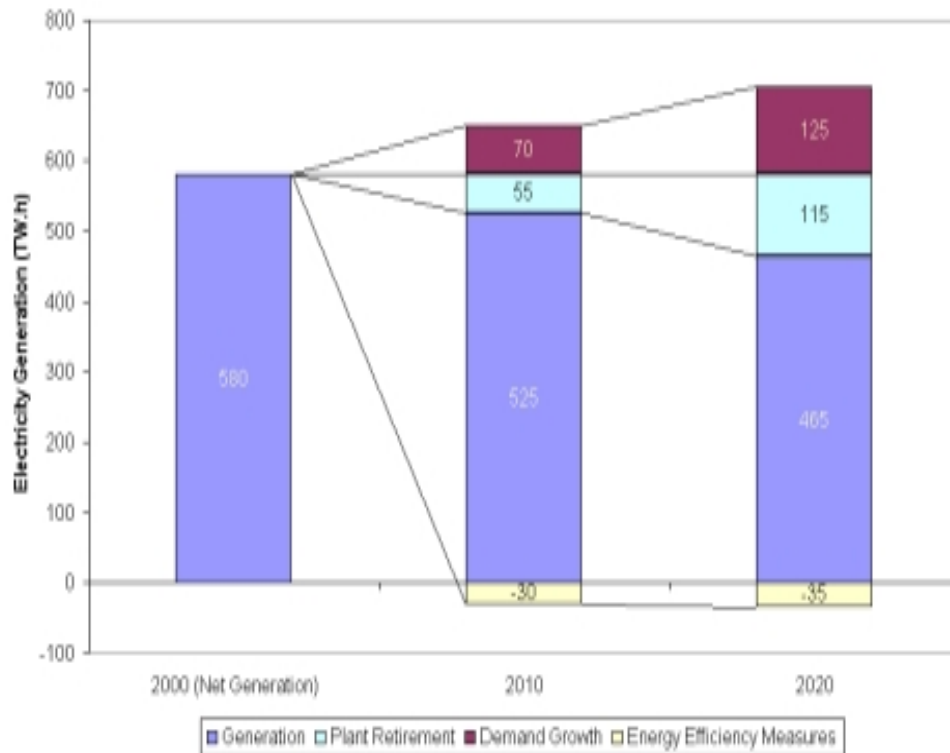


Expect slower than historical demand growth from 2010 to 2020 but still likely in excess of population growth.



Cdn Electricity Supply

Average of MARKAL, NRCAN, and NEB Canadian Supply Projections to 2020



- New demand, plant replacement and exports require significant new capacity build over the next twenty years
- By 2020, 205 TW.h from new, replacement & life extension – 35% of 2000 production
- Indicates new and replacement investment of over 20,000 MW per decade to 2020 (2000 capacity~ 112,000 MW)



Overview

- 4 Key lines of business:
 - Generation, Transmission, Distribution, Retail
 - Traditionally built along provincial lines

- Regulatory environment:
 - Province – intraprovincial issues – eg permitting
 - Federal – interprovincial & international
 - Shared – environment

Overview

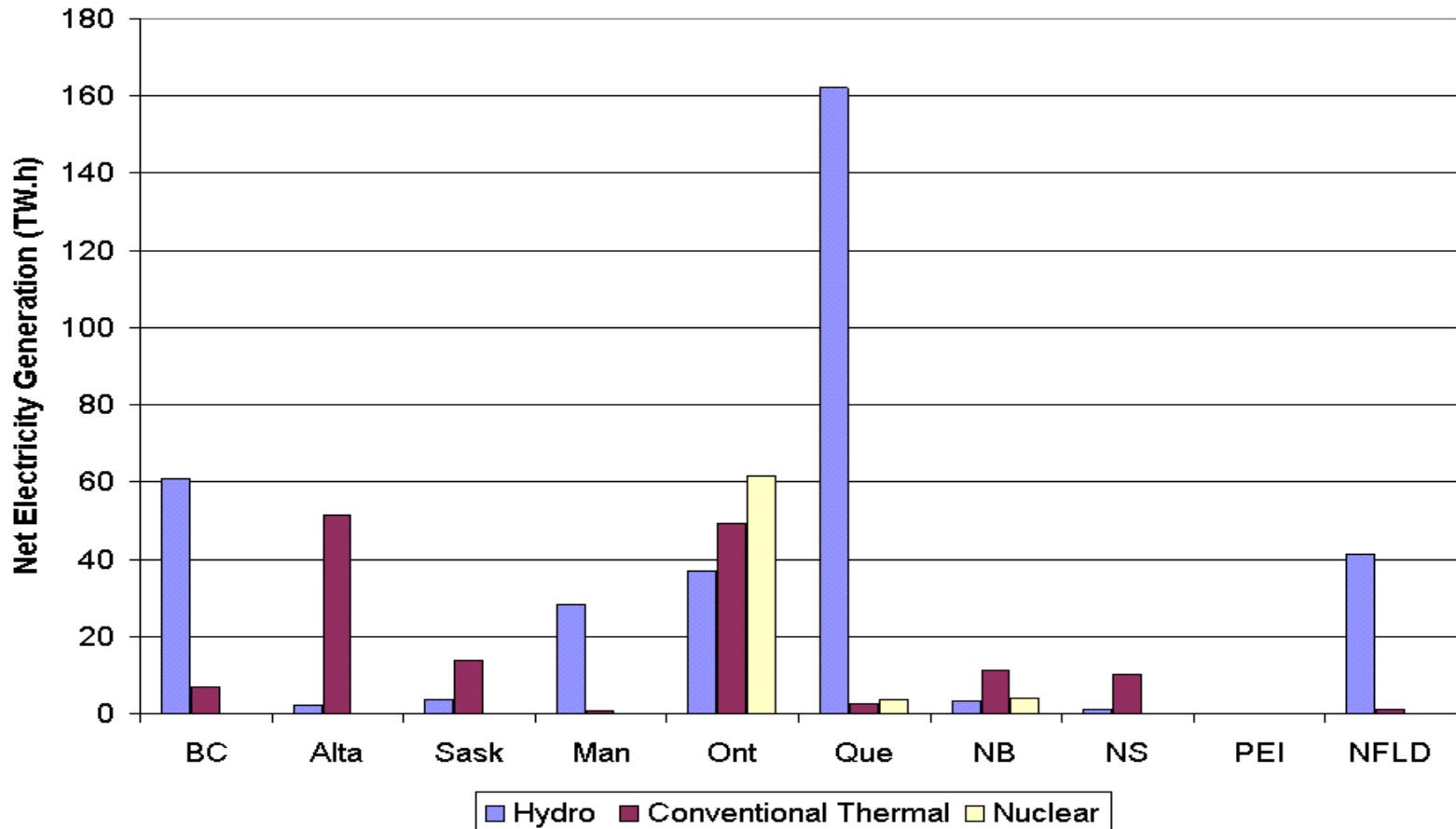
Restructuring – continuing but uncertain

- 1998 – 83% gen. provincially owned
- Most moving away from vertical integration
- Most have wholesale transmission access
- Few with retail access – Alta, NS, Ont

Generation by Region 1998

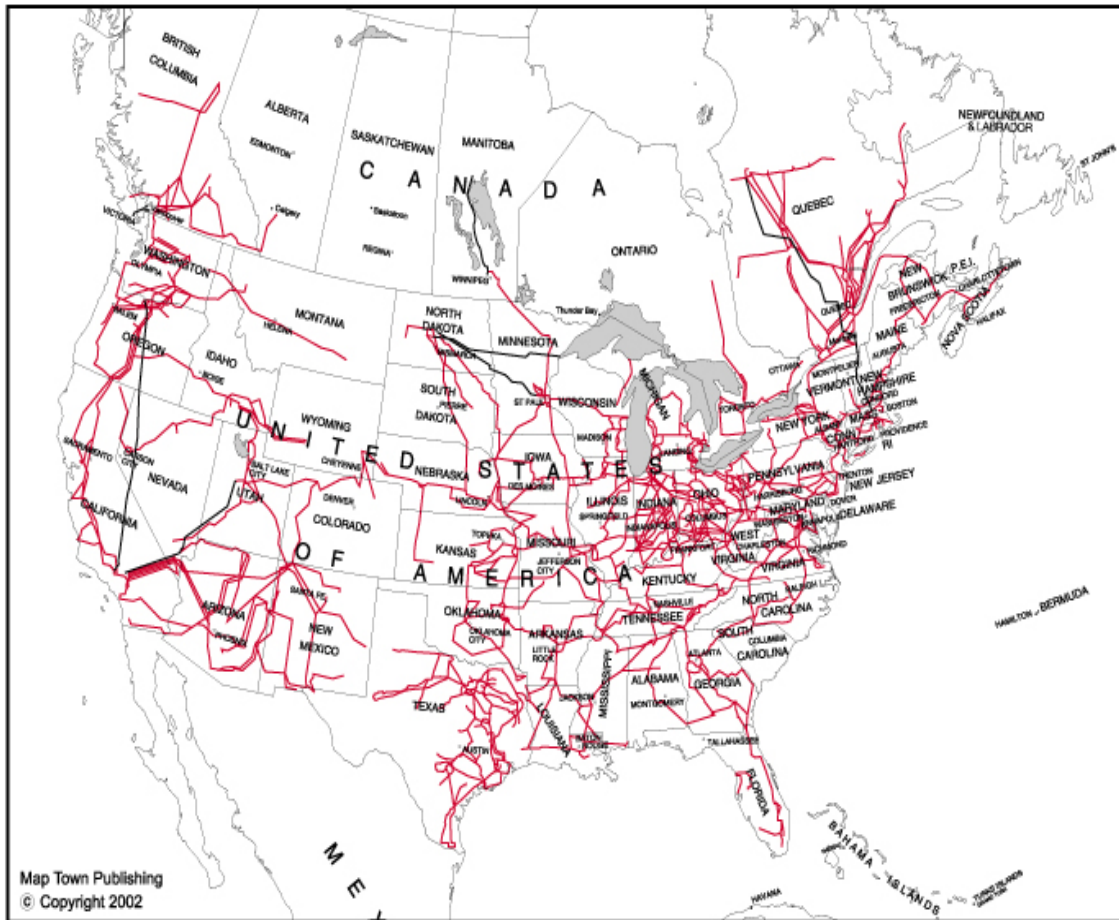


Source: Electricity Database NRCan 2000





Transmission Capacity



- ❑ Existing major North-South inter-ties reflect historic market realities.
- ❑ Growing interest in inter-provincial transmission-but infrastructure is underdeveloped.
- ❑ New transmission needed to support competition, ensure reliability.
- ❑ Regulatory and tax changes needed to support transmission expansion.



Economic Context

- Growing demand despite economic uncertainty
- Market restructuring continuing but on a less certain track
- North American integration
- Risk averse capital markets



Security Context

- Electricity is a fundamental underpinning of the modern economy.
 - Security, reliability and power quality of growing importance.
- Security issue has a number of dimensions (long and short-term)
 - Fuel/technology diversity
 - Adequacy of supply
 - Operating reliability
 - Infrastructure protection



Environmental/social Context

- Climate Change
- Air Quality
- Habitat/Species
- Hazardous Materials and Waste
- Occupational Health & Safety
- Local Communities

Principles for Managing Multiple Agendas



- Recognize regional realities
 - resources, markets, environmental conditions, different market structures and regulatory regimes
- Encourage fuels & technology diversity
- Facilitate market integration
- Strategically invest in technology & innovation.



Generation Choice Issues

- Environmental Trade-offs
 - Among pollutant releases – Reducing one can increase another
 - Environmental domains
 - removal from one domain can impact other
 - Gen choice determines impacted domain (local/regional/national, air/water etc)
 - Competing interests – eg water use – hydro vs fish vs recreation

We are making progress

- Electricity & emissions intensity are falling – and set to decline further
- Effective habitat management is now the norm.
- Effective management regimes for waste & hazardous materials.
- Technological diversity & use alternative technologies are growing.
- Community engagement is now the norm.



Sustainable Electricity Future

- Three underlying objectives:
 - Security & Reliability
 - Affordability
 - Environmental Performance
- These require continuing investment in the right conditions