

Waterpower – Ontario's Primary Renewable Resource

Ontario Waterpower Association

Presentation Overview

- ▶ Waterpower in Context
- ▶ Waterpower Development Cycle
- ▶ Green Energy Act/Feed in Tariff

The Ontario Waterpower Association

- The provincial renewable energy organization committed to the sustainable development and management of Ontario's waterpower resources
- Representing 99% of Ontario's renewable waterpower generation
- 140 members (legal, environmental, engineering, project finance, construction, Aboriginal)
- Focused on public policy affecting waterpower
- Proponent of the Class EA

Waterpower – Modes of Generation

- ▶ Run-of-River
- ▶ Storage/Reservoir
- ▶ Cascade
- ▶ Pumped Storage
- ▶ Kinetic

Run-of-River

- ▶ A hydroelectric power plant with a limited amount of storage potential for water.
- ▶ A run-of-river plant operates at a fixed head and passes whatever natural inflows enter the headpond.
- ▶ Run-of-river plants do not have reservoirs on the immediate upstream side of them, but generally do have headponds



Storage/Reservoir

- ▶ A power plant which is normally operated to provide power during maximum load periods.
- ▶ Storage facilities have reservoirs which are capable of storing many hours or days of flow based on peak plant flow.
- ▶ Storage plants usually also have additional control dams upstream to store water and regulate water levels



Cascade

- ▶ A series of hydroelectric power plants utilizing the same block of falling water over again as it passes downstream from the uppermost plant to the last plant in the sequence



Pumped Storage

- ▶ A pumped storage plant generates electric energy for peak load use by utilizing water pumped into a storage reservoir at high elevation, usually during off-peak periods



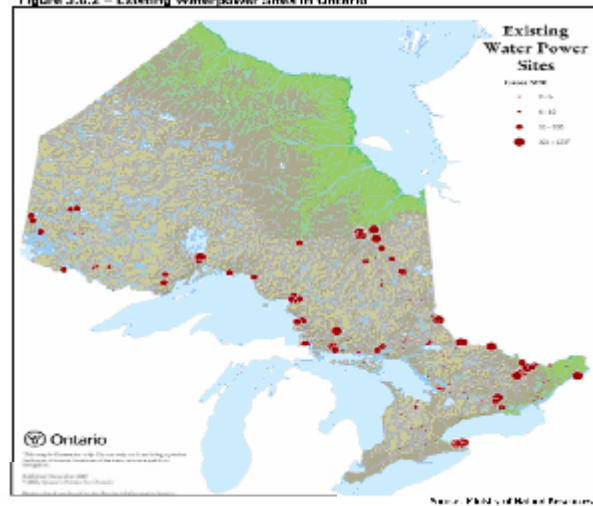
Kinetic

- ▶ Uses only the “flow” of the river (i.e. no head)
- ▶ Not yet commercially applied in Ontario



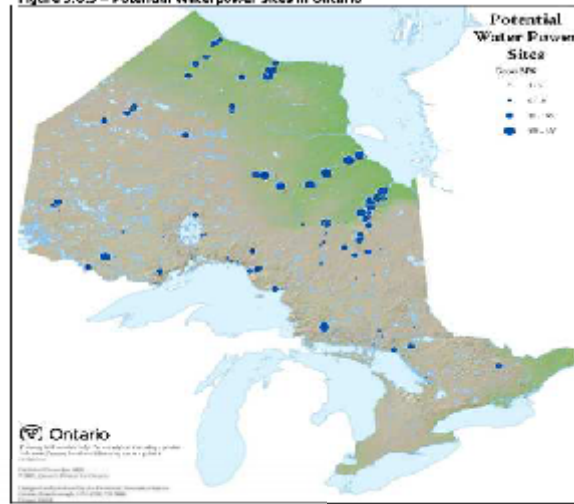
Waterpower in Ontario

Figure 3.6.2 – Existing Waterpower Sites in Ontario

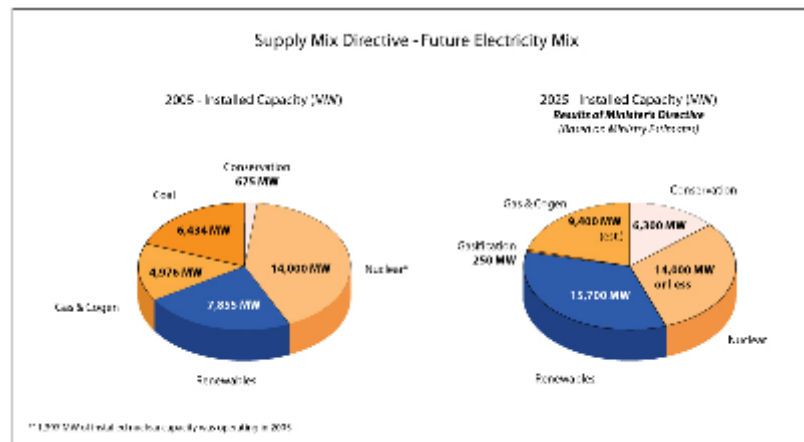


Identified Opportunities

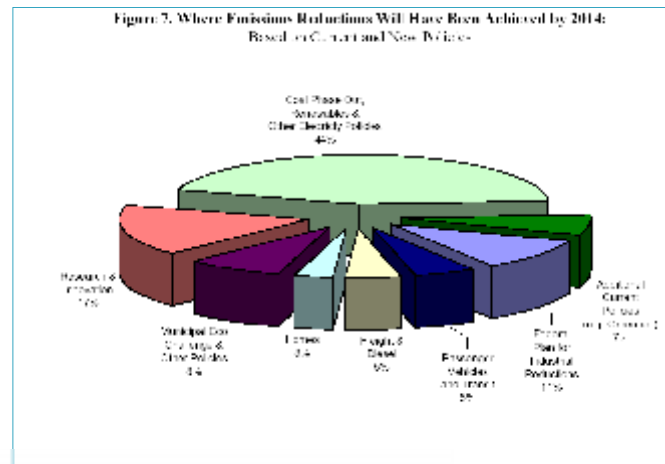
Figure 3.6.3 – Potential Waterpower Sites in Ontario



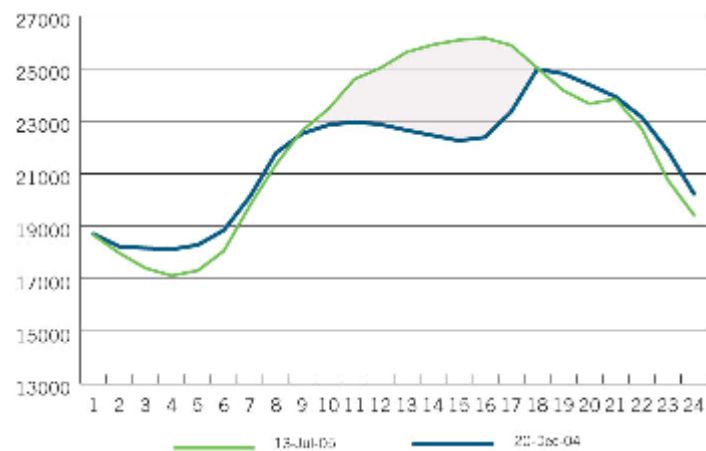
Ontario's electricity future



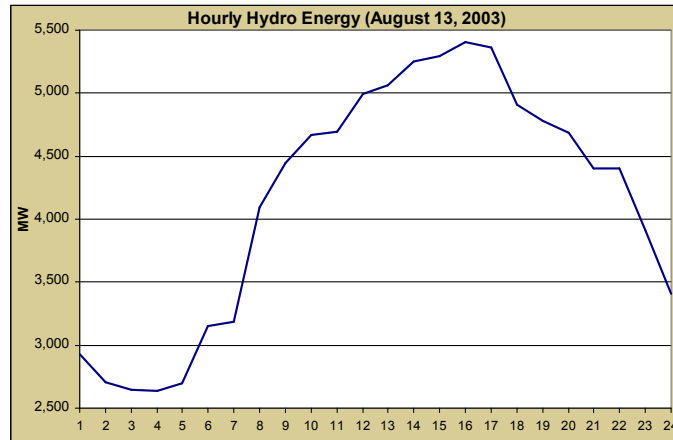
Policy linkage – climate change



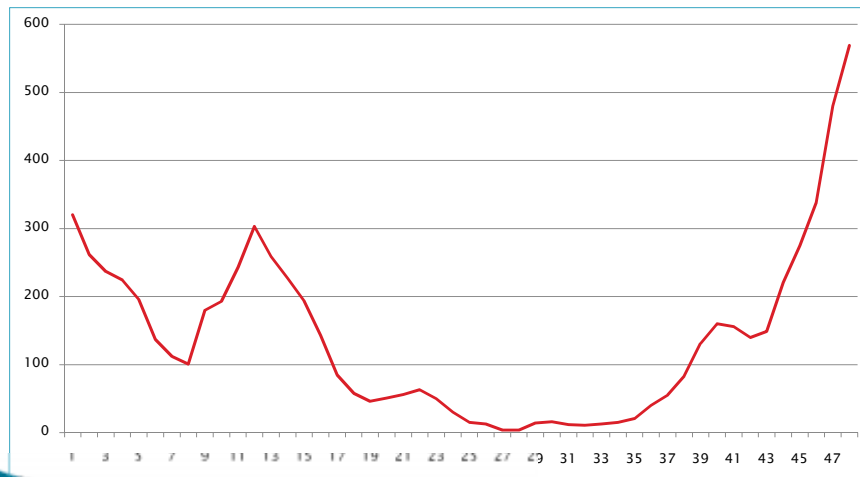
Our “energy” challenge



The role of waterpower – flexibility



Integrating Intermittants

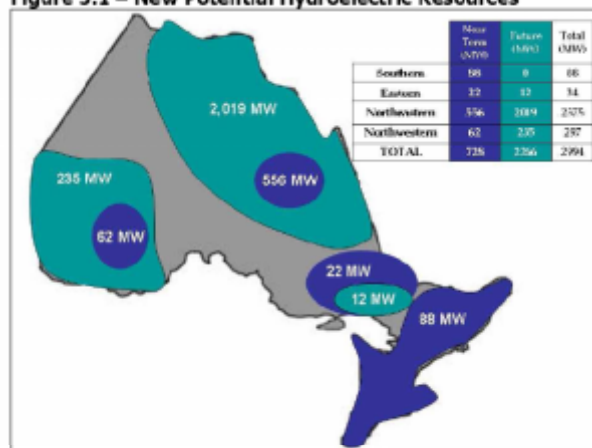


The Integrated Power System Plan.....

“The economic advantage of hydroelectric power is even greater because of the higher capacity value. Hydroelectric resources make a much larger contribution to meeting annual peak in system demand, thereby substantively avoiding the need(and costs) for other resources that would be needed to meet system adequacy requirements”

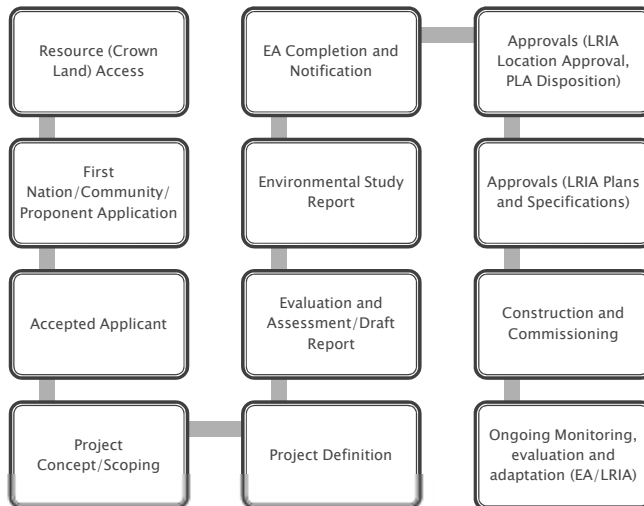
“All practical hydro included”

Figure 3.1 – New Potential Hydroelectric Resources



Source: OPA

Waterpower Development Cycle



GEA/FIT Timelines



Feed-in-Tariff launch results

Technology Breakdown										
Fuel Source	Provincial	Bio-Gas	Bio-Gas on Farm	Biomass	Landfill Gas	Solar Ground	Solar Rooftop	Water	Wind (On-shore)	Wind (Off-shore)
Contract Offered	184	7	0	2	4	76	1	46	47	1
Sum of MWh Contract Offered	2421	16	0	19	13	651	1	162	1229	300

FIT for Waterpower

Figure 3: Feed-in Tariff Prices for Waterpower Projects in Ontario

Fuel Type	Project Size	Contract Price	Indexation	Contract Term
Waterpower Projects	<10MW	13.1¢ / kWh	20% (CPI) indexation to contract milestone commercial operation date	40 years
	> 10MW < 50M	12.2¢ / kWh		

Figure 4: Feed-in Tariff Peak Production for Waterpower Projects in Ontario

Fuel Type	Hours	Peak Incentive	Peak Disincentive
Waterpower Projects	11 a.m. to 7 p.m. (business days)	3.5% increase in pricing (1.53)	
	After 7 p.m. to 10 a.m. (including weekends)		10% decrease in pricing (0.9)

Hydroelectric Contract Initiative

- ▶ All un-contracted facilities except OPG (135)
- ▶ 20 year contracts for existing generation
- ▶ Same peaking provisions as FIT contracts
- ▶ Strong incentives to add capacity, upgrade, re-develop

To learn more....



To learn more.....

OWA Power of Water Conference – October
18/19, 2010

Westin Harbour Castle, Toronto