



Renewable Energy Opportunities on the Trent-Severn Waterway

Presentation to

The Panel on the Future of the Trent-Severn Waterway

Ontario Waterpower Association – June 20, 2007



Presentation Outline

- The Ontario Waterpower Association
- Recent history of efforts with the TSW
- Waterpower on the system
- Key challenges
- A case example – Ontario Power Generation
- Opportunities
- Recommendations



The Ontario Waterpower Association

- The provincial renewable energy organization committed to the sustainable development of Ontario's waterpower resources
- Representing 99% of Ontario's renewable waterpower generation
- Responsible for one quarter of the province's energy supply
- Focused on public policy affecting waterpower



Recent History of Effort with the TSW

- November 2004 – OWA informs the federal government of concerns related to the disconnect between the operation of the TSW and the policies on climate change
- December 2004 – Parks Canada indicates that its mandate does not include renewable energy
- January 2005 – OWA encourages a joint discussion with federal agencies
- March 2005 – Parks Canada re-iterates position that renewable energy is outside its mandate

Recent History of Effort with the TSW

- April 2005 – OWA arranges a joint discussion with key federal departments (Parks Canada, NRCan, Environment Canada)
- May 2005 – EC responds, suggesting that the OWA has raised broader public policy issues – offers to facilitate a multi-stakeholder discussion of water management
- June 2005 – Parks Canada and MNR host an “Integrated Water Management Workshop”
- Workshop recommends “immediate gains should be pursued” – no action taken to date



Recent History of Effort with the TSW

- October 2005 – Federal departments meet with the industry to map a path forward
- November 2005 – OWA drafts a Terms of Reference for a Steering Committee focused on water resource management and waterpower opportunities
- January 2006 – OWA and federal agencies confirm the mutual interest in implementing the Terms of Reference

Recent History of Effort with the TSW

- April 2006 – TSW responds to OWA efforts to initiate formal dialogue:
 - “Our capacity on the hydro and water management front is severely limited. At the present time, it is more than fully engaged in attempting to resolve a range of issues associated with existing licences and in responding to a significant number of unsolicited applications to develop new sites along the waterway”

Recent History of Effort with the TSW

- May 2006 – OWA meets with TSW to advocate for progress
- TSW indicates that there is a potential for review of the governance and mandate of the waterway
- TSW indicates that immediate priorities are:
 - An improved waterpower site release process
 - Revision to water rental rate structures
 - Tenure
 - Water resource management

Waterpower on the TSW

- 18 facilities across the TSW (Severn Falls to Sonoco)
- ~ 100 MW of installed capacity
- Offset of 40 million kg of CO₂ – 100,000 cars
- Direct revenue to TSW
- Modifications to existing water management can increase production by up to 20%
- Re-development and new developments can add an additional 30%
- These federal lands can contribute to climate change objectives!



A Case Example - OPG

- OPG and others are recipients of the water controlled by TSW.
- The primacy of navigation needs to be balanced to achieve multiple benefits.
- The understanding and management of complex watersheds and associated risk needs to be improved.

TSW Operations

- There are immediate, significant improvements possible within the parameters of the existing licenses and the Dominion Water Power Act that would benefit renewable energy production without affecting any other resource use values, including navigation.
- Adjusting the current approach to water management would improve impacts on the ecosystem, public safety and protection to property owners.
- Water spilled past our generating plants means that generation must come from other sources.

TSW Operations

- TSW operate within narrow water level ranges - the goal is to stay with little allowable deviation from that range.
- Dam operations performed to correct the undesirable elevation or trend, can be large in magnitude and frequent. When elevations perceived as too low, dams are all but closed off. When elevations are too high, floodgates opened and a tremendous volume of water is released.
- Operation appears reactionary in nature. May be that tools currently used to operate the system need to be updated to the new set of tools with higher level of capability.

TSW Operations

- During high flow and transition periods including high precipitation events, the rate of change in flows on the outlet dams of the TSW systems is extreme.
- Frequent and dramatic changes in flows from outlet dams, particularly during transition to navigation periods, if moderated could significantly improve generation without impacting navigation on the system. Power producers would like to see a “smoother” flow regime.

Severn System

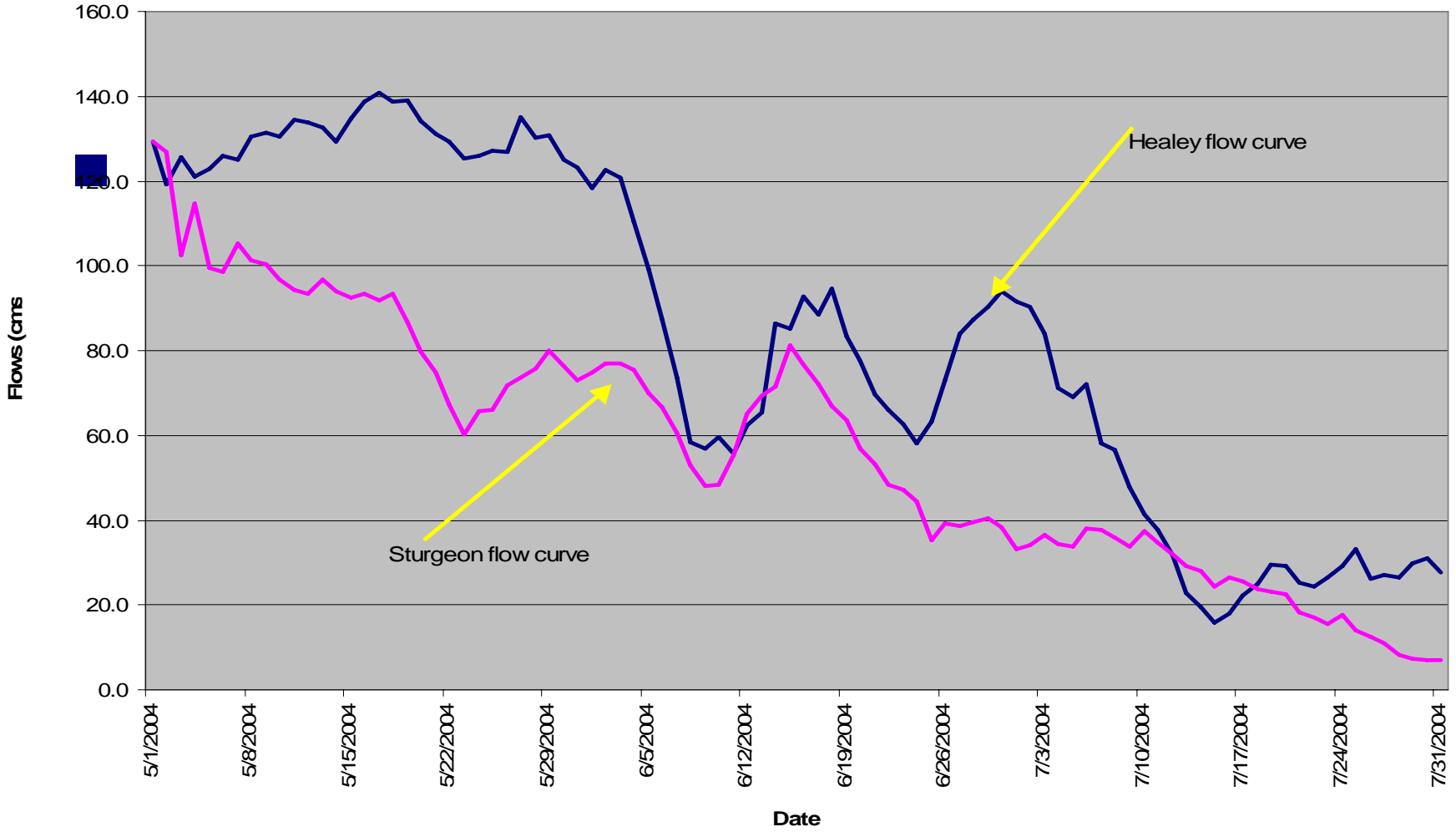
Simcoe-Couchiching Level and Flow 2003/2004



TSW Operations

- During dry summer periods, water flows are relatively and perhaps unnecessarily low due to large volume of water run out of the system storages in spring to reduce the risk of undesired high flows for navigation i.e. >130 cms.
- Maximum flow constraints during the navigation season that appears to drive a behaviour that is not conducive to smoother flows on the system.

Healey vs Sturgeon



Water Management Model

- One key factor to the solution is to ensure TSW has the resources and tools to perform their role.
- The current tools used to operate TSW system are somewhat antiquated (Acres reservoirs simulation program now more than 20 years old).
- Current operation is high maintenance for TSW staff, forced on addressing the many competing interests of stakeholders. This process is laborious and stressful. High expectations on the TSW water manager.

Water Management Model

- Modern water models work at a much higher level of sophistication → required for management of complex water shed given competing interests → better understanding of risk and improved risk management.
- By using a database in the model, calculate percentile operating ranges using TSW's own historical data.

Where do we stand today?

- TSW appears receptive to a new ways of operating and a decision support water management tool.
- OPG has been modeling part of the system and sharing with TSW to demonstrate the benefits of better tools.
- TSW has agreed to some deviations in operating ranges in their reservoirs. These changes are small currently but a step in the right direction.



Opportunities

- Take early action on “low hanging fruit” – success leads to success
- Leverage industry investment in a water management model for TSW
- Leverage industry investment and experience in Water Management Planning

Opportunities

- Re-balance priorities on the TSW – from the primacy of navigation to multiple benefits.
- Revisit operating ranges on storage lakes -alleviate need for immediate and dramatic changes on water flows.
- Pursue water management regimes that uses storage reservoirs to a much higher degree for flow attenuation.
 - Flow changes are much less volatile with reliance on the buffering effect of the associated storage reservoir.

Opportunities

- Increase flexibility for log and dam operations in terms of frequency and timing.
- Eliminate single line rule curve and work within an operating range that is appropriate to all system users.
- Position waterpower revenues as a key contributor to water resource management

Recommendations

- Recognize our common interests (industry manages infrastructure too)
- Build on the efforts already undertaken between the OWA and TSW – we can be “ahead of the curve”
- Position the TSW as a case example of the federal commitment to its Climate Change Agenda – “House in Order” approach
- Strategically invest in water management tools and capacity – linked to waterpower revenues
- Make targeted improvements first – build a basis for positive change

Thank you

