

## **PRESENTATION FROM BRIAN HODGSON**

Thank you for this opportunity.

My name is Brian Hodgson and I am the Reeve of the Municipality of Victoria Beach. My family has owned our cottage there since 1945 and I have seen the effects that continued high lake levels have on the shoreline.

Lake Winnipeg is a valuable resource for many reasons. It's a recreational resource, a commercial resource and a hydro resource and we all need to learn to live with and manage it properly.

Many organizations are working toward cleaning up the lake pollution and its negative effects on recreation and commercial activities.

Provincial, Federal and State Governments, Manitoba Hydro and the private sector are all providing funds for research to find ways to improve the water quality and maintain its recreational and commercial viability.

Hydro wishes to have a new license issued so that it can continue to meet present electricity needs and be able to provide future electricity to the people of Manitoba economically. However, Mother Nature is not being cooperative when it comes to Hydro being able to control the lake within its existing temporary license approved levels, and the exceptionally high water levels have a negative effect on the South Basin.

Manitoba Hydro has plans to increase its generating capacity to support Manitoba's population and industrial growth. It also wants to increase its generating capacity, enabling it to sell power to our American neighbours in an effort to offset the cost of providing electricity to Manitobans. Hydro claims it needs to be able to have the lake controlled to 715 feet ASL (above sea level) in order to meet this increased forecast demand. It is this forecasted demand for the exports where there appears to be short sightedness by Manitoba Hydro and its advisors who are

forecasting the increasing demand for hydro sales to the USA and Canada.

Have Manitoba Hydro's forecasts for increased exports and demand factored in the new **shale gas deposits** in the northern states and their likelihood to use this local resource for electrical generation rather than purchase electricity from Manitoba?

In addition to the new hydrocarbon resources in the USA which can be used for electrical generation, innovation and improved methods of providing new and better products have been the mainstay of the economic growth of many industries in Canada and the USA, and they are continuing and will impact on the estimates for new hydro generation.

While researching material for this presentation, I came across many new and innovative concepts and products which I believe will change the requirement for Hydro's need to increase its generating capacity to the extent it is forecasting.

**Wind turbines and solar generation** are increasing all across North America. In a recent flight from Texas to Winnipeg I saw hundreds (possibly thousands) of wind turbines. Ontario has provided funding for hundreds (possibly thousands) of solar panel installations to augment the online power demand.

As an example of the effects of new innovation and technology - the Minneapolis-St. Paul International Airport is planning a 3megawatt solar power installation to generate nearly 20 percent of the airport's electricity, which is to be completed in fall 2015, and they will also have 7,700 parking ramp lights converted to LEDs.

The cost per watt for silicon photovoltaic panels has decreased 1000 fold between 1970 and today, and there have been great advances made in battery storage capacity, but these are not the most exciting developments. Both of these methods of electrical generation are intermittent, in that the wind does not always blow and the sun does not

always shine, and the power generated cannot be stored - that maybe about to change.

Researchers at Harvard have discovered how to **convert solar energy into liquid fuel**, potentially accelerating our switch to the alternative energy source, according to an article in the scientific journal "*Proceedings of the National Academy of Sciences*". They have developed a method of using the sun to split water into hydrogen and oxygen and then combining the hydrogen with carbon dioxide to form isopropanol which can be stored as a liquid fuel and thus used later to fuel thermal electric generation.

(Reference: <http://www.sciencedaily.com/releases/2015/02/150209161423.htm>.)

**Journal Reference:**

Joseph P. Torella, Christopher J. Gagliardi, Janice S. Chen, D. Kwabena Bediako, Brendan Colón, Jeffery C. Way, Pamela A. Silver, Daniel G. Nocera. **Efficient solar-to-fuels production from a hybrid microbial–water-splitting catalyst system.** *Proceedings of the National Academy of Sciences*, 2015; 201424872DOI: [10.1073/pnas.1424872112](https://doi.org/10.1073/pnas.1424872112))

Another important development which is being improved upon continuously is **Nuclear Fusion**. This technology has been around for several decades now and the design and improvements being made may soon put economical electrical generation by means of Nuclear Fusion within reach of every jurisdiction, thus negating the need to transport electrical energy over great distances at astronomical costs.

(Reference: <http://climatecolab.org/web/guest/plans/-/plans/contestId/10/planId/1304168> )

The **Hydrogen Fuel Cell** is a proven technology which is being continually improved upon, and can provide the means of generating clean green electricity close to the end user. Fuel cells are appealing because they generate very little pollution, and most of the hydrogen and oxygen used in generating electricity ultimately combine to form the

harmless byproduct, water. They are not economically viable yet, but advances are continually being made.

Whether it is electricity generated by Hydrogen Fuel Cell, Wind Turbine, Solar Cell or Nuclear Fusion, or the **introduction of LED lighting**, all are on the cusp of great advances in capability and cost efficiency.

How will these new and improved methods of using, generating and storing power affect Manitoba Hydro's long term export forecasts? If these advances are not incorporated into the export equation, Manitoba Hydro will potentially build massive generating and transmission capacity which may never be needed.

I present all of the above information to show that just possibly, Hydro has not done its due diligence to the fullest extent, and that they may not need the generating capacity presently being forecast. These new technical innovations must be considered before billions of dollars are spent based on their existing forecasts, which cannot truly be substantiated.

Lake Winnipeg is the water reservoir which Hydro relies upon today for its capacity to generate the power it presently needs, and for what it is forecasting to be needed for domestic and export sales. Given that there is a possibility that, that increased capacity may not be needed - should Manitoba Hydro be given a long term license which allows it to maintain Lake Winnipeg at levels which are detrimental to the health of the recreational and biological aspects of the lake and marshes?

The lack of low water levels over the past years have resulted in many of the marshes disappearing, which are required to help filter out the pollutants which are impacting the health of the lake. Private property has disappeared into the lake as a result of the erosion and the lack of natural sand replenishment, which historically occurred during low water and south wind conditions.

The same lack of low water episodes has resulted in the destruction of many, if not most, of the public recreational sand beaches around the South Basin. With the continuously high water levels the wave action takes the sand off the beaches into the deep water. With the continuous high water the natural wave action is unable to scour the lake bottom and return the sand onto the beaches. Normally in the past, when there were south winds and low South Basin Lake levels, which historically happened before regulation, the beaches were rebuilt by nature. This does not happen anymore. Lower water levels are needed for this to happen.

Manitoba Hydro needs a license to use the lake as it's reservoir, but does it need a long term license at this time, when there are so many advances being made toward alternate energy generation and storage? Manitoba Hydro is still seeking more export contracts with the USA and they have not yet built the generating capacity to provide that export. I propose that Manitoba Hydro be given a 5 year temporary license with the regulated lake levels restricted between 711 feet ASL and 714 feet ASL. This will allow Manitoba Conservation and Manitoba Hydro and other environmental organizations, to evaluate the effects of the lower water levels on the ecological and physical aspects of the South Basin. Manitoba Hydro's ability to prevent Mother Nature from raising the lake levels above 715 feet above sea level may be aided by having the maximum regulated lake level at 714 feet to start with. Just possibly it may not exceed the 715 level when we get exceptional weather conditions, as it frequently has in recent years.

The municipalities and private land owners around the South Basin of Lake Winnipeg have spent millions of dollars trying to prevent erosion caused by high water levels. The continued expense by these entities is not sustainable. The Municipality of Victoria Beach, a municipality of only 7 sq. miles and 2300 tax payers have spent over \$400,000 on engineering studies for shoreline protection, with the engineering recommendations proposed to cost in excess of \$ 5,000,000 to protect a small portion of their shoreline. Multiples of this will be needed to

protect the balance of their shoreline. This is just one municipality. If shoreline erosion continues due to high water and massive amounts of financial aid are not forthcoming, the recreational resource which Lake Winnipeg affords the population of Manitoba will be further impacted negatively. Land values will depreciate, tax bases will disappear, tourism will decline and the province will suffer economically.

Manitoba Hydro and the Manitoba Government must balance the economic impact of continuing to try to regulate the lake level to 715 ft ASL, based on questionable export forecasts, in a changing market, with that of a loss of tourism, recreational and commercial revenues generated by a healthy, well managed lake.

As I have proposed, the Commission should give Hydro a new temporary license for 5 years, to regulate the lake to a maximum of 714 feet above sea level and establish an independent group to monitor the marshes and shoreline to see if there are improvements.

Manitoba Hydro must:

- be required to monitor weather events and water flows from the entire catch basin and be proactive by reducing the lake levels in advance of the water levels reaching the regulated threshold.

- they must re-evaluate their forecasts for future electrical sales and reassess the level at which the lake needs to be regulated to provide the proper balance between Hydro's profit, the recreational quality of Lake Winnipeg and the health of the marshes.

If Hydro's new and improved forecasts confirm that there will likely be a reduced demand, then some of the billions of construction dollars saved could be used to improve their ability to safely increase the water flow out of Lake Winnipeg through their system so as to not cause flooding and hardship in the downstream communities.

**Baird Engineering** has prepared a report for the Provincial Government which states:

**”The latest Intergovernmental Panel on Climate Change report projects even greater variability in our weather in the coming**

**decades due to climate change (IPCC, 2014) and McCullough (2015) predicts the trend of increasing inflow to Lake Winnipeg will continue in the future. These anticipated future conditions could lead to higher lake levels unless the rules for regulation are changed or the Jenpeg outflow structure is modified to accommodate higher discharge rates”**

The Canadian Taxpayers Federation calculated Manitoba’s debt to be exceeding \$30 billion in 2013. Should the present provincial government be intent on adding another \$24 billion in debt for Manitoba Hydro alone, this, to build dams and transmission lines for shaky export markets against prevailing expert advice?

**Albert Einstein said: “Your imagination is your preview of life’s coming attractions”.** Can Hydro imagine a world with increased alternate electrical energy sources?

There is another factor that I would like the Commission and Hydro to consider.

The new channel being constructed to reduce the level of Lake Manitoba is going to put water into Lake Winnipeg in the North Basin. Either Hydro or the Provincial Government has estimated that it will only raise the lake level by an inch or two. When the North winds blow for several days it will push that water from the North Basin, with a surface area of 15 times that of the South Basin, into the South Basin. What will the increased wind generated lake level be in the South Basin with that extra inch or two moving into the South Basin from the North Basin?

Will that extra water in the North Basin delay the movement of water out of the South Basin and cause levels to remain elevated causing shoreline erosion to increase and the nutrient levels to remain high in the South Basin?

Has the 1 or 2 inches of wind adjusted lake level, that Hydro states that regulation has contributed to the average lake level since regulation, had the same effect on the health of the lake?

In recent documents which I have read, it is apparent that the isostatic rebound effect on Lake Winnipeg is in fact a force which must be considered when calculating the actual level of the lake. If, in fact, the north end of Lake Winnipeg has rebounded by 0.1 m, since hydro began regulation on the lake, it could be interpreted to mean that the actual water level of the South Basin is, in effect, 10 cm higher than the level measured at end of the North Basin. Given that 6 of the lake level gages are in the North Basin and only 2 in the South Basin one might assume that unless Hydro has been adjusting their calculations on a yearly basis, they are in fact underestimating the wind adjusted level of the lake in the south Basin.

In the real world, the wind adjusted levels are meaningless when it comes to shoreline erosion. The maximum wind adjusted level has been about 718 ft. whereas, in actuality, the water level in the South Basin was in excess of 220m or 721.75 ft ASL, causing major flooding and shoreline damage in many areas.

One would think that knowing that isostatic rebound was, is, and will continue to occur, Manitoba Hydro would be actively working towards increasing their ability to maximize the flow of water from Lake Winnipeg, to ensure adequate flow for their generating stations in the future, when isostatic rebound has raised the North end even higher.

I have not read the whole interim operating license which was put in place some 30 or 40 years ago and I wonder if, in fact, it states that the lake would be regulated within the 711 - 715 ft wind adjusted levels or was it not specified. If not, then those interpreting the license, like myself, would likely assume that it meant the actual measured water levels in the South Basin and not the wind adjusted levels. In either case, I can assure you that the average person in 1970, hearing that the lake would be regulated to control the levels within the 711 - 715 ft. range did not consider the wind effect and the fact that the South Basin could actually rise to 720 feet ASL or above and that Hydro would be still

within their operating range, and not have to release any water in an attempt to reduce the impact on shoreline erosion in the South Basin. I am sure I was not alone in believing that Hydro would be able to reduce the lake levels if their 715 ft maximum was exceeded, but apparently they cannot. Their estimates of 40 years ago of the expected maximum inflow to the lake appear to have been flawed. What other estimates did they make which did not account for climate change? Ignorance of the facts is not an excuse, but it was, and is a fact, that the average Manitoban had no idea what damage Manitoba Hydro was about to do to Lake Winnipeg. As the Steward of the lake, Hydro must be held responsible for the proper management of that resource and its well being. Changes must be made to their operating license to ensure that happens.

The International Institute for Sustainable Development's submission to this hearing stated that,

"our overarching recommendation is that there is need for a framework for basin-wide management, and that ecosystem services should be an integral part of its design."

They also said,

"We encourage Manitoba Hydro and other stakeholders to view upstream storage in wetlands and distributed storage systems ...as reservoirs tied into hydro. The volume of Lake Winnipeg as a reservoir is small, but water could also be stored upstream rather than in the lake itself."

Their recommendations need to be implemented as soon as possible. In the meantime, Hydro needs its license, which as I stated earlier should be a 5 year temporary license, with the high water level regulated to a maximum of 714 feet ASL while all of the recommended studies are undertaken and the updated forecast considerations are taken into account before a permanent license is considered.

Thank you  
Brian Hodgson  
Reeve - Municipality of Victoria Beach