



## **SUBMISSION TO THE ONTARIO MINISTER OF ENERGY IN REGARDS TO ONTARIO'S LONG TERM ENERGY PLAN (LTEP)**

DECEMBER 15, 2016

The Canadian Nuclear Workers Council (CNWC) is the collective voice of organized labour in Canada's Nuclear Industries.

Our member Unions are located in Saskatchewan, Manitoba, Ontario, and New Brunswick. Several of our member Unions are located in Ontario. Some of our member Unions are directly involved with the electricity system in Ontario whereas others are indirectly involved.

The CNWC participated in several of the Public Consultations which were held during November 2016.

We have reviewed the documentation that has been provided in regards to the LTEP.

Unions that represent workers in the electrical power sector are well positioned to provide advice on the LTEP as their members are the people who operate and maintain the electrical power system from the start to finish. Our comments will be from this perspective.

The CNWC will comment on the following areas of the LTEP

- Consultations Sessions held in November 2016.
- Ontario's Energy mix – Electricity
- Demand Forecast for Electricity
- Electricity pricing
- Distribution and Grid Modernization
- Conservation and Energy Efficiency
- Clean Energy Supply
- Wind Turbines & Solar Panels
- Electricity Storage
- Nuclear Power
- Supply Mix
- CNWC conclusions and recommendations

### **Consultations Sessions held in November 2016.**

The CNWC participated in several of these sessions along with representatives from our member unions.

On the positive side these sessions provided for good discussions on energy issues with participants from a variety of sectors including politicians. The format was good with many views being expressed on the topics with some agreement expressed on several issues.

**Unfortunately, we suggest, that the system was flawed as on the wrap up sessions the facilitators only reported on issues that lined up with the LTEP discussion document. Issues where the group did not agree or suggested improvements were not reported.**

## Ontario's Energy mix – Electricity

The CNWC agrees that a diverse mix of generation is essential in Ontario. Our conclusions from the 2005 vs 2015 scenario differ from the conclusions drawn in the discussion document.

In 2005 Ontario had an installed capacity for electrical generation of approximately 31,000 MW. The peak power required in 2007 was approximately 27,200 MW. The TWH hours in 2005 was 156.

Looking at 2015 the installed capacity was 39,000 MW. The peak power requirement in 2015 was approximately 23,000 MW and the power production was 160 TWH. Source: Ontario Planning Outlook, 2016

In 2016 the installed capacity will exceed 40,000 MW.

The system is designed to meet the peak demand and naturally not all generation supplies are always available so excess installed capacity is required.

In 2007 with a peak of 27,200 MW the system had an installed capacity of 31,000 MW or 3800 MW reserve whereas in 2015 with a peak of approximately 22,500 MW the system had 39,000 MW or 17,500 MW in excess capacity. The total annual load demand between 2005 and 2015 were very similar (156 TWH vs 160 TWH)

**The CNWC suggest that with the proper mix of generation such a large amount of excess generation would not be required.** Therefore the energy mix is not correct. We further suggest that this very large increase in installed capacity was not necessary and has contributed to the excessively high cost of electricity to the rate payers.

In regards to emissions we agree that there has been a large reduction since 2005. We contribute this to Nuclear Power's role in being the major supplier of electricity in Ontario.

The CNWC suggest that this trend will not continue.

With the Nuclear Units being shut down for refurbishment (a very good & necessary imitative), an increasing demand, the eventual shut down of the Pickering Nuclear Power Plant, the fluctuations in wind power supply, etc emissions of GHG will drastically increase. **The simple reason for this being that there will be an increased in GHG emitting gas fired power generation.**

## Demand Forecast for Electricity

The CNWC agrees with outlooks C&D in the demand scenarios.

Looking at the period 2005 – 2015 which resulted in a reduction in peak and only a small increase in overall demand (156 TWH to 160TWH) we suggest that this was due to the following:

- Total load reduction due to the loss of industrial load in 2008 – 2009
- Peak reduction due to successful load shedding and load shifting programs.
- Conservation initiatives

**The CNWC suggest that we will not see additional decreases in the areas above in the next ten years.**

## Electricity Pricing

Hydro costs are very much in the forefront. Workers in the power industry are naturally ratepayers as well. They are feeling the pressures of the high prices as well as pressure from the public as they are the front line electrical workers.

The CNWC suggest that one of the main drivers on the price of electricity is the Green Energy plan. **To have 6000 MW of high cost wind power that has a capacity factor of 20% or less is not acceptable.**

The three prong pricing for electrical rates, we suggest, was introduced to reduce power demand during peak periods. Back in 2007 the system was stretched to meet the peak demand. Moving ahead to 2016 there is now an excess of 17,500 MW of installed capacity above the peak power demand. This amount of installed capacity is planned to increase. Granted all of this capacity is not all available at peak demand periods.

**However there now is a sufficient amount of reserve power available to meet the daily peak therefore ratepayers need not be penalized for using power during periods of high demand.**

## **Distribution, Grid Modernization, Transmission and Interconnections**

It is very important to have a system that provided stability of supply to industry, businesses, and the public. However, there appears to be more and more outages.

There is a major increase in back-up generator installations. This is for all ratepayer groups. **The emissions from these generators we suggest are not included in the emissions reports for the electrical power industry.**

Low maintenance and replacement of the transmission and distribution systems is the biggest factor in outages. Outages are very costly for everyone.

Outages in cottage country in Ontario is an example. Utilities appear to have cut back on the frequency of tree trimming. Walk down a cottage road and one can see many potential outages due to tree branches being too close to the distribution lines.

Grid modernization can improve response time for outages and also provide efficiencies.

Many critics promote using power from other jurisdictions. Energy systems are normally designed for self-sufficiency for the jurisdiction. Tie lines are good for stabilization of the grid, sharing power from time to time, to assist in power shortages, providing a means of selling excess power, etc.

There are many interconnections within the Ontario Grid. It must be remembered that there are line losses when electricity is transmitted over long distances and large transmission line are very expensive, take a long time to build, and face public opposition. In many cases it is probably cheaper to build new generating facilities than transmitting power long distances.

Imports from Quebec are promoted. Interestingly, Ontario exports power to Quebec in the winter months.

## **Conservation and Energy Efficiency**

The CNWC supports conservation measures.

We believe there have been some good gains to the improvements in the efficiencies of electrical equipment of all types, including commercial and personal item. There will be some but small gains in these area in the future. Electrical items require power to operate and always will so they can only make more efficient use of electricity they cannot eliminate the requirement.

We suggest that load shifting and shedding techniques have been utilized to the maximum.

With more and more people moving to Ontario each year the residential load will increase. Add to this the continuing introduction of devices that are powered by electricity. The electrification of the transportation industry will increase the overall demand but may have a minimal effect on peak load.

**Conservation measures have to be seriously considered but they are not an end all solution.**

## **Clean Energy Supply**

Some critics believe that the electrical system can be 100% supplied by renewables. This is not possible now or in the foreseeable future.

**The CNWC suggest that the term renewables should be eliminated and replaced with the term Clean Energy. Nuclear Power is a clean energy supply.**

## **Storage**

The CNWC supports the storage option in some scenarios specifically in hydroelectric production.

The best example being the OPGs pump storage facility at the Sir Adam Beck Pump Generating Station at Niagara Falls.

It is suggested that these type of facilities could be powered by Nuclear Energy in the off peak hours.

Pump storage generation is dispatchable which is required by the grid.

## **Hydroelectric**

These plants produce nearly no GHG. Some of these plants can follow the load demand similar to gas plants. They naturally operate on water. Water is a variable commodity due to the fact that some years there is more water than other years. These fluctuations will probably increase due to climate change.

## **Wind Power**

The amount of wind power must be capped.

To have 6000 MW of an intermittent supply that is only available 20% of the time is not practical or cost effective. Wind power is costly 13.3 cents/kwh compared to Nuclear at 6.8 cents/kwh (OEB May 2016). There are many reports that calculate wind power as being much more expensive than being reported. Also wind power is available in low demand times.

There is an excessive and continuing amount of public opposition to wind farms. This was expressed by local politicians at the LTEP Consultations.

Wind turbines have a life expectancy of approximately 20 years – 25 years. There are studies now that suggest these turbines may only last for 12 years. Some studies indicate that gear boxes have to be replaced after 10 – 12 years. Are there any guarantees from the Wind Power Suppliers that they will repair/refurbish wind turbines that fail in 10 – 15 years? Is there a decommissioning plan in place to remove old wind turbines?

The LTEP is looking ahead for 20 years. It is suggested that many of the current wind turbines will possibly be reaching the end of life status beginning in a few years.

## **Solar Panels**

Solar Panels also need to be revisited. What is their life expectancy? Studies suggest that inverters will require replacement in a 10 – 15 year period. Inverters are costly. Will solar suppliers replace these devices?

These panels also lose efficiency with age. The Ontario environment, we suggest, is very extreme and may result in a more rapid deterioration of these panels. They contain some heavy chemicals. Is there any decommissioning plans in place? Again their intermittent supply causes issues.

Some wind and solar will benefit the grid but the amounts have to be considered. The intermittent operation requires GHG emitting Gas Power Plants to make up the power short falls. When Gas Power Plants have load swings due to intermittent wind power they do not have an efficient gas burn compared to a steady state condition. This results in an increase in GHG emissions.

When looking at electrical generation supplies the economic factors have to be considered. Jobs created are a major factor. When one passes by a wind farm or solar farm how many workers do you see? None or very few.

## Gas Power Plants

This form of generation is required due to the fluctuating outputs of Wind and Solar generation. These plants are very good at meeting the changing demand and as back-up for other generator outages.

Looking ahead they will be required more in the future as the load demand increases and especially after Pickering NPP is shut down.

The cost of power from these plants is high for several reasons. First of all they do not operate all the time. As they back-up wind and solar the true cost is the gas plant costs plus the wind or solar costs. Secondly, we suggest, that gas plant owners have to be guaranteed a certain return on their investment so they will be paid for being on standby.

Gas Plants do not require many workers. Their fuel supply is their largest cost. Prices are stable now but have the potential of increasing in the future which will naturally increase the cost of the electricity produced.

A good example of the jobs scenario. A Gas plant, Brighton Beach, Windsor, Ontario, 600 MW. There are approximately 27 workers. A similar size Nuclear Power Plant (NPP), 650 MW, Candu 6, Point LePreau NPP, New Brunswick, 700 plus workers. What will be better for a community a GHG emitting gas plant with 27 jobs or a NPP with no GHG emissions and 700 plus jobs?

## Nuclear Power

Nuclear Power Plants (NPP) currently supply up to 60% of Ontario's electrical demand. They emit no GHG and have a very high capacity factor. Add to this that the cost of electricity from the NPP is 6.8 cents/KWH.

It is very important that the OPG Darlington NPP and the Bruce Power NPP be refurbished. These refurbished NPP will provide stable, reliable, cost-effective and carbon free supply of electricity for the people of Ontario for the next 40 plus years.

These NPP refurbishments will greatly benefit the Ontario economy. The majority of the components required for the refurbishments will be supplied by Ontario Companies. There will be 20,000 plus jobs created by these projects.

It has to be pointed out that these projects are costly. The Bruce Power Refurb will be financed by the owners of Bruce Power and not Ontario's ratepayers.

**NPP supply base load power. Base load power will, we suggest, increase over the years and therefore so should the supply of Nuclear Power.**

## **CNWC Conclusions**

We suggest that a diverse mix of generation is required but the LTEP discussion document must revisit the proposed mix.

Renewable sources of power are good for the environment. Environmentalists believe that these sources are only a solution and can meet the electricity requirements of Ontario. The science does not support this theory and it is not a reality today or in the foreseeable future. There has to be a realistic and economic balance for these types of power supplies. The proposed mix for renewables is not correct in our view.

More nuclear power is the solution in our view.

## **CNWC Recommendations**

1. The Unions in the Electrical Power Industry in Ontario represent a very high percentage of the workers in the industry. Workers know what works and what does not work in their industry. Union leaders have direct access to these experts.

**The CNWC strongly suggest that a Labour Union advisory committee be established to advise the Minister of Energy on the LTEP for Ontario.**

2. The amount of Wind and Solar produced electricity should be capped.
3. Pump storage hydro-electric stations be seriously considered.
4. The refurbishments of Darlington proceed as planned. The refurbishment of the Bruce Power Units proceed as planned.
5. The life extension of Pickering NPP be approved.
6. A new build NPP be approved for the Darlington Site.
7. Bio energy be expanded for power peaking. Existing coal power plants be considered for bio energy and gas conversion.

We are prepared to answer any questions or concerns you may have with our submission.

**Submitted By**

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