

February 19<sup>th</sup>, 2007**Nova Scotia Integrated Resource Plan GHG Reduction Scenarios***Briefing by the Ecology Action Centre*

The Ecology Action Centre wishes to write to NSPI, the Board and interveners at this stage of the Integrated Resource Plan (IRP), specifically on the matter of GHG reduction assumptions outlined in the latest information sent on February 9<sup>th</sup>, 2007. We are writing at this time in the hopes that a useful discussion can occur on this matter at the upcoming technical conference. We wish to note that the EAC has every interest in a speedy and realistic conclusion to the IRP process.

In this briefing the EAC provides an initial analysis of the GHG targets outlined in the IRP as well as a new proposal for consideration that would add new scenarios based on the principles of the UNFCCC and change the positioning of the 'base' scenario.

The EAC recognizes that we are currently in a time of uncertainty with regards to greenhouse gas emissions regulations. We also recognize that climate change and the environment have become the top public policy issue for Canadians and that the Fourth Assessment Report of the Intergovernmental Panel on Climate Change has clearly put to rest any denial of the reality of climate change. We also recognize that the Stern review on the economics of climate change has shown that the economic impacts of climate change could be equivalent to the Great Depression. Stern has clearly shown that the costs of taking action now are much less than the costs of the impacts of global warming. Indeed significant economic development benefits can accrue to Nova Scotia's communities through a transition towards sustainable energy.

GHG reduction scenarios are especially relevant to Nova Scotia, given that some of Canada's most cost-effective opportunities for GHG reductions exist within our coal-dependent electricity sector.<sup>1</sup>

It is incumbent upon the IRP process to provide a full and realistic assessment of NSPI's carbon liability. To do this a realistic assessment of the impacts of global warming and a realistic assessment of both international conventions and national political reality are critical.

Therefore, the EAC feels it is incumbent upon itself to provide information, at this time, on the reduction paths that are being suggested to meet the goals of the United Nations Framework Convention on Climate Change (UNFCCC) to avoid dangerous and potentially irreversible levels of global warming.

To ignore the reality of global warming and its devastating impacts and the effect NSPI's future carbon liability could have on the ratepayers of this province will not allow the IRP to make a realistic assessment of the future. We urge all parties to realize that a realistic estimate of NSPI's carbon liability is in everyone's interest and the best way to find the most cost-effective and socially responsible strategy for Nova Scotia's electricity sector.

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<sup>1</sup> See for example, Mark Jaccard (2002) The Cost of Climate Policy

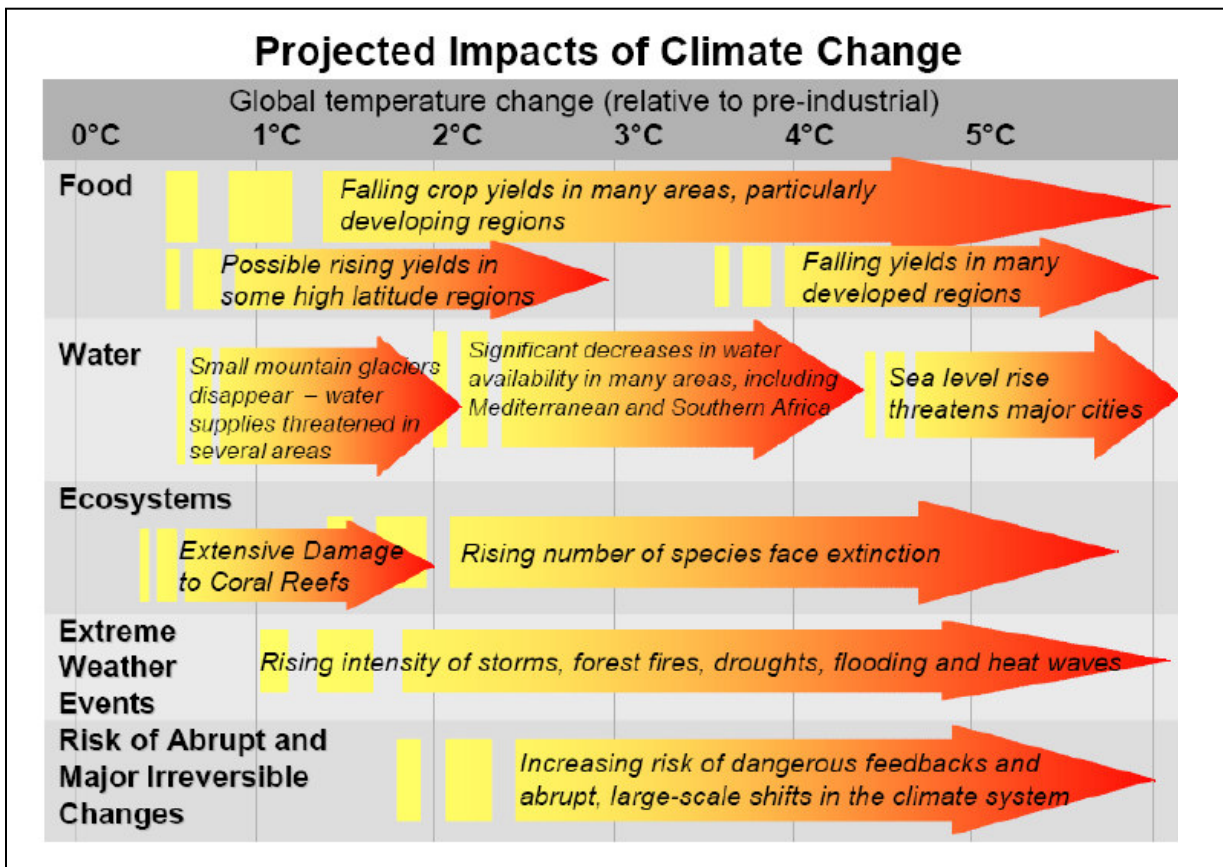
## Principles of the UNFCC

Article 2 of the United Nations Framework Convention on Climate Change (UNFCC) states that the ultimate objective of the Convention is:

“Stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”

As the graph below from the Stern Review on Climate Change indicates, some of the most severe impacts begin to occur at a level of warming that is 2°C above the pre-industrial mean. At this level, extensive damage to coral reefs will have occurred, significant decreases in crop yields and water availability will occur, and the risk of dangerous feedbacks, leading to abrupt shifts in the climate system, could occur.

2°C is now widely accepted as the level that corresponds with dangerous interference with the climate system. The European Union has thus stated a goal of limiting warming to 2°C above pre-industrial levels. It is important for us to realize that the impacts of climate change will not increase in a one-to-one ratio with the amount of greenhouse gas emissions and the level of global temperature change. After 2°C the climatic system is expected to enter the realm of “abrupt and major irreversible changes”. These abrupt changes can create a point of no return, where climate change becomes irreversible.



Article 3(1) of the UNFCC also states that:

“The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance

with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.”

The UNFCCC also notes that:

“the largest share of the historical and current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs.”

Thus the UNFCCC is called upon to consider GHG reduction targets based upon avoiding dangerous interference with the climate system while considering that targets will differ based upon different jurisdictions’ historic responsibility and capacity to act. Since the industrialized countries have both an historic responsibility and a capacity to act, their emission reduction targets will be greater. These principles must be kept in mind when NSPI is considering any estimates of its future carbon liabilities.

### **GHG Reduction Targets to Prevent 2°C**

A report by the Pembina Institute on Carbon Liability<sup>2</sup> references two reports that have estimated GHG reduction targets for industrialized countries. One is by the Netherlands Environmental Assessment Agency and one by the Germany Federal Environmental Agency. Tables of the targets suggested are provided below:

#### Reduction Scenarios by GHG concentration

Netherlands Environmental Assessment Agency:

	400 ppm CO <sub>2</sub> e	450 ppm CO <sub>2</sub> e	500 ppm CO <sub>2</sub> e	550 ppm CO <sub>2</sub> e
Reduction below 1990 level by 2020	25–30%	10–20%	5–15%	0–15%
Reduction below 1990 level by 2050	85–90%	75–85%	65–70%	55–60%

German Federal Environmental Agency:

	400 ppm CO <sub>2</sub> (c. 450 ppm CO <sub>2</sub> e)	450 ppm CO <sub>2</sub> (c. 550 ppm CO <sub>2</sub> e)	550 ppm CO <sub>2</sub> (c. 650 ppm CO <sub>2</sub> e)
Reduction below 1990 level by 2020	25–50%	10–30%	5–25%
Reduction below 1990 level by 2050	80–90%	70–90%	40–80%

In the scenarios outlined in the IRP thus far<sup>3</sup>, both the “low” scenario which assumes ever-increasing emissions and the “base” scenarios, which would not meet the Kyoto

<sup>2</sup> Bramley (2005) pg. 24.

<sup>3</sup> Assuming NSPI’s GHG reduction targets would be similar to the reduction targets for all industrialized countries. If anything, we believe this would provide an underestimate of the reduction targets, given that some of Canada’s most cost-effective GHG reduction opportunities occur within Nova Scotia’s electricity sector.

target until 2030, would surely go above 500 ppm of equivalent CO<sub>2</sub><sup>4</sup> if all industrialized countries were to do the same, putting avoidance of dangerous climate change out of reach.

Only the “high” scenario with reductions less than those under Kyoto and less than the targets currently being discussed internationally would come close to reaching the 2020 target necessary for 500 ppm of CO<sub>2</sub> equivalent. Please note that this is only within the range of the Netherlands study. At this level of concentration the risk of overshooting 2°C, and therefore experiencing dangerous levels of climate change, is very high.

According to Hare and Meinshausen (2004) the risk of dangerous climate change at 550 ppm CO<sub>2</sub>e<sup>5</sup> is 68%-99%. Considering that the ‘high scenario’ in the IRP would only be within the range of the 2020 target needed to reach 550 ppm CO<sub>2</sub>e under the Netherlands study, and that the reductions called for in 2020 are conservative compared to what is suggested within this range, the IRP’s “high” scenario makes it very probable that dangerous climate change would occur.

The Kyoto scenario outlined is the minimum of what is needed to reduce to 400 ppm of CO<sub>2</sub> (about 450 CO<sub>2</sub>e). The Kyoto scenario in the IRP is 30% below 1990 levels by 2020, but does not seem to follow on a linear trajectory towards 80% from 1990 levels by 2050, which is near the lower range of the German Federal Environmental Agency’s suggested target. So even this scenario might not be adequate.

As outlined above, to reach 400 ppm of CO<sub>2</sub> a reduction of 50% below 1990 levels by 2020 and a reduction 90% below 1990 levels by 2050 would be considered within the realm of possibilities.

More recent scientific evidence, coupled with assumptions related to equal distribution of rights to the atmosphere, suggests that deeper reductions could be necessary. Colin Forrest (2005) compiles some of the most recent scientific evidence to reach a more aggressive target to avoid 2°C of warming. Forrest (2005) considers first that the ability of the biosphere to sequester greenhouse gases is likely to reduce, second that the population will continue to increase, and third that there is to be an equal per capita distribution of rights to the atmosphere. This would require a 93% reduction from current levels by 2030 for Canada.<sup>6</sup>

## **Conclusion & Proposal**

As can be seen, it is only the Kyoto scenario in the IRP that could be considered at all adequate if we follow the principles outlined by the UNFCCC. In fact, more aggressive reduction scenarios are being considered in the international community.

As previously stated, the EAC recognizes the current era of regulatory uncertainty. However it is also recognized that Canada’s current political environment has put the Kyoto scenario in the IRP very much on the agenda. The environment and climate

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4 Equivalent CO<sub>2</sub> is a proxy for all Greenhouse gases.

5 Estimated to be about 450 ppm CO<sub>2</sub>.

6 Per capita GHG emissions are taken from Energy Information Administration, 2005. International Energy Annual 2003. Table H.1cco2 World Per Capita Carbon Dioxide Emissions from the Consumption and Flaring of Fossil Fuels, 1980-2003. <http://www.eia.doe.gov/pub/international/iealf/tableh1cco2.xls>

change is the top public policy issue in opinion polls and on February 15<sup>th</sup> a majority of federal parliamentarians voted for Canada to meet the target under the Kyoto protocol.

It seems only reasonable to assume that GHG regulations would be based upon the principles of the UNFCCC to avoid the most dangerous impacts of climate change with consideration for the industrialized world's historic responsibility and capacity to act.

For the IRP to operate within a realistic band of GHG reduction assumptions, the EAC is proposing that two extra scenarios be considered in the IRP:

- 1) The first assumes a 50% reduction below 1990 levels by 2020 and a 63%<sup>7</sup> reduction below 1990 levels by 2030
- 2) The second assumes a 94% reduction from current levels by 2030. A concave shaped reduction path from today's emissions can be followed to reach the 2030 target.

The current 'low', 'base', and most probably the 'high' scenarios are completely unreasonable if Nova Scotia is to join the world in making any meaningful attempt to avoid dangerous levels of climate change. The 'Kyoto' scenario and other 'deep reduction' scenarios are in accordance with the principles of the UNFCCC.

We should consider that the 'high' scenario is the only one except for Kyoto that leaves any chance whatsoever of avoiding dangerous climate change – and a very slim chance at that. We should also recognize that Canada's current political environment is one where a majority of parliamentarians have supported a Kyoto based reduction path, but the executive branch is, thus far, showing unwillingness to respect the vote. Given this situation we feel that it is very reasonable to request that a modified<sup>8</sup> 'high' scenario be listed as the base scenario and that a Business As Usual or 'low' scenario as well as the 'deep reduction' paths outlined above be considered within the band of possibilities.

The EAC also suggests that NatSource calculate carbon credit prices that specifically correspond with each of the GHG reduction scenarios identified. It is, at present, unclear if the carbon credit prices identified realistically track the reduction scenarios in the IRP.

We are willing to present this information in person at the technical conference on February 22<sup>nd</sup>. We hope the information presented is useful, and that all parties can come to a reasonable conclusion regarding GHG reduction assumptions that are truly in the public interest and supportive of the environment in which we all live.

**Attachments & Relevant References:**

- 1) Matthew Bramley (2005) Future Financial Liability for Greenhouse Gas Emissions from New Large Industrial Facilities in Canada. The Pembina Institute.  
[http://www.pembina.org/pdf/publications/Liability05\\_final.pdf](http://www.pembina.org/pdf/publications/Liability05_final.pdf)
- 2) Collin Forest (2005) The Cutting Edge: Climate Science to April 2005.  
[http://portal.campaigncc.org/files/THE\\_CUTTING\\_EDGE\\_CLIMATE\\_SCIENCE\\_TO\\_APRIL\\_05.pdf](http://portal.campaigncc.org/files/THE_CUTTING_EDGE_CLIMATE_SCIENCE_TO_APRIL_05.pdf)
- 3) Bill Hare and Malte Meinshausen (2004). How Much Warming Are We Committed To And How Much Can Be Avoided? PIK report 93. Potsdam Institute for Climate Impact Research. (attached)
- 4) Stern Review on the Economics of Climate Change [http://www.hm-treasury.gov.uk/independent\\_reviews/stern\\_review\\_economics\\_climate\\_change/sternreview\\_index.cfm](http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm)

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7 This is linear towards a 90% reduction below 1990 levels by 2050.

8 The EAC does not understand why no GHG reductions take place between 2020 and 2025 in the 'high' scenario. It seems reasonable to assume that some reductions would occur over this period.