

# Energy superpower? Only if we find a champion.

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Prime Minister Stephen Harper committed Canada to become an energy superpower at the 2006 G8 Summit in St. Petersburg, Russia. A better vision for Canada would be to become a sustainable, environmentally sound energy superpower. In any event, a vision without a plan is but a dream. It's not about walking away from fossil fuels and closing down coal plants. It's about learning to work with what nature has given us, without using the environment as the dump for waste products.

Canada has an opportunity to provide global leadership in addressing the collision between energy and the environment, the dominant issue facing our planet in this century. We lack only one ingredient - the national will. In the past, our big achievements have been conceived and led by champions. The railway across Canada, the construction of our airport system in the midst of the depression, the massive James Bay generating facility, the unlocking of the deeply buried oil sands - in each case, there was a champion who provided the leadership and who created a sense of public purpose. Where is Canada's champion to lead our energy vision? Stephen Harper came very close in 2006, comparing the oil sands to building the pyramids or the Great Wall of China. We have not seen many environmental advances yet, mainly just studies and then more studies.

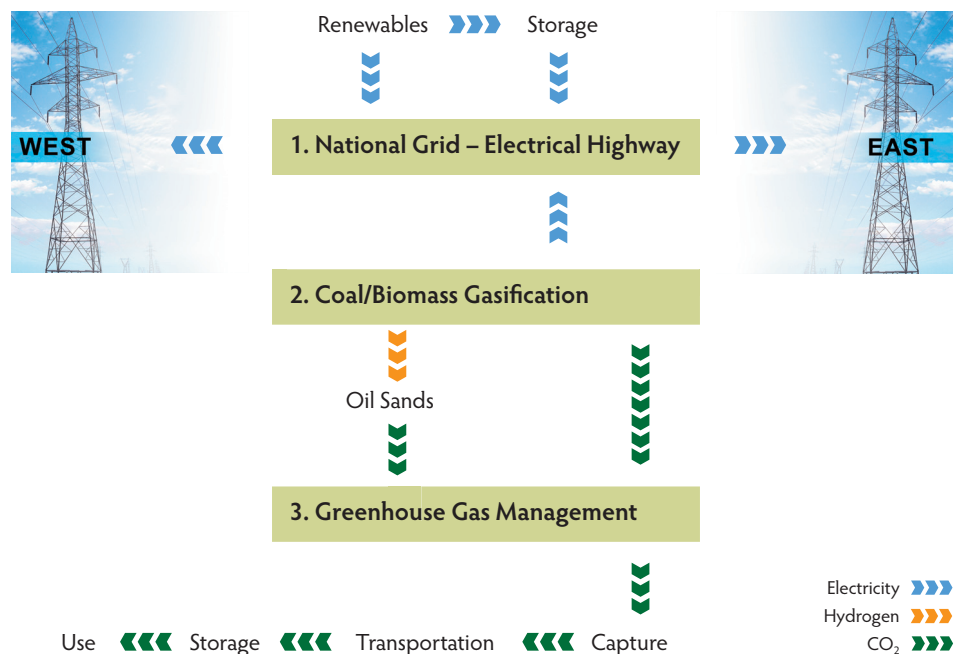
We know the pathway. More than 100 energy experts, under the auspices of the Canadian Academy of Engineering, have proposed that Canada undertake the following three nation-building projects.

- **Gasification of coal and biomass** (to produce hydrogen, electricity).
- **Greenhouse gas management** (carbon dioxide capture, followed by transportation, long-term storage and/or use).
- **A National Electrical Highway** (Upgrades to electrical infrastructure with improved local access for wind and other renewable energy sources).

Coal gasification is not combustion with the accompanying release of massive emissions of carbon dioxide at low concentrations. New coal/biomass gasification technology produces hydrogen, electricity, and a concentrated stream of carbon dioxide that can be recovered and stored underground.

The oil sands, a major contributor to Canada's future wealth, are not usable until the bitumen is upgraded by the addition of hydrogen. The existing practice of producing the needed hydrogen from natural gas (a low carbon footprint fuel) is not a viable long-term solution. Coal and oil sands

## Three Canadian Nation-Building Projects



need to be seen as an integrated resource.

Greenhouse gas capture, transportation and storage are natural pathways for Canada. We are already injecting carbon dioxide into conventional oil reservoirs to promote enhanced oil recovery. We have almost unlimited future storage capacity in deep underground saline aquifers. The carbon dioxide is not stored as a high-pressure gas, in danger of sudden release. It is stored as a liquid in the pore space, just like the original petroleum.

Electricity is a provincial responsibility. Each province has developed its own electricity sector in accordance with provincial energy policies and prevailing economic forces. This has typically resulted in stronger north-south than east-west connections and in many provinces has left a legacy of significant use of fossil fuels for the generation of electricity.

Canada has renewable energy sources such as water and wind, in addition to uranium for nuclear reactors, that can provide electric power with very low greenhouse gas emissions over their life cycle. Significantly strengthened and new east-west ties to form a robust national power grid would encourage interprovincial trade in electricity, provide improved grid access by renewable sources and enhance reliability of supply.

There is a made-in-Canada model for the appropriate type of project management. In the 1970s, former Alberta premier Peter Lougheed, faced with minimal interest by the international oil companies in the deeply buried oil sands, established a cross-sectoral management board to spearhead the required field demonstration projects.

His initial \$100-million "signal" to industry led to a \$1-billion to \$3-billion (in today's dollars) joint government/industry program. The concept of a

cross-sectoral management board to meet our current challenges has been proposed by both the recent Canadian Academy of Engineering Energy Pathways report, and NRCan's commissioned Powerful Connections - also known as the Bruneau report.

So why are we not running our energy system this way now? The technologies are largely new and have not been tested on a full commercial scale. Canada has unique coal and biomass feedstocks. Processes that have been demonstrated in other countries need to be validated and "tuned up" for use in Canada.

The opportunity is huge, the plan has been strongly and widely endorsed, and an appropriate management structure has been proposed. The prize is unparalleled economic and social wealth in Canada over this century. This should be our moon shot. Where is the national will? Where is our champion?

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Clement Bowman is a former executive with Imperial Oil Ltd., and former head of the Alberta Research Council. He will be receiving the \$1.3-million Global Energy International Prize in St. Petersburg on June 7 from Russian President Dmitry Medvedev for his work on the development of highly efficient processes for oil extraction.