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A PROJECTION ON ONTARIO'S LONG-TERM ENERGY PLAN

Installed Capacity (MW)	2003	2012	2030 Government Projection[1]	2030 Our Projection	2050 Our Projection
Nuclear	10,061	11,446	12,000	11,446	0
Hydroelectric	7,880	7,947	9,000	7,947	7,947
Renewables (Wind, Solar, Bioenergy, etc)	155	1,633	10,700	31,307	52,753
N. Gas	4,364	9,987	9,200	0	0
Coal	7,546	3,504	0	0	0
Total	30,006	34,517	40,900	50,700	60,700
Semi-Distributed Power Storage (Systems)	0	0	0	-10,000	-20,000
Final Total	30,006	34,517	40,900	40,700	40,700
Conservation	0	?	7,100	9,987	10,000
			Estimated 15% Growth	Estimated 15% Growth	Estimated 15% Growth
Demand Seasonal Normal Weather Peak (MW)		23,298	26,793	26,793	30,812

[1] http://www.mei.gov.on.ca/en/pdf/MEI_LTEP_en.pdf

GOALS

- By 2030, the conservation amount will have gradually increased to about 10000 MW
- By 2030, the amount of natural gas generation will have gradually decreased
- By 2030, renewables will have gradually increased to about 31000 MW
- Existing energy storage systems such as hydrogen and Fe batteries will start to be used[2]
- A national energy storage systems research program will be started
- By 2030, an energy storage capacity of 10000 MW will have been reached

HOW

Creating Future's Sustainable/Conservative Culture

Energy is part of our daily life and lifestyle; therefore, we cannot think of energy issues as a separate entity. If we would like to make significant changes on energy production, we need to start thinking about making significant changes in our lifestyles. Today's culture (modern culture) is mainly motivated by 'wants' rather than 'needs'. We make our choices based on our desires, but not on our needs. Consequently we do not evaluate and describe our essential needs for healthy sustainable living. Answers to the following questions will help guide us in shaping our future lifestyles:

How much do we need? (Food, water, living space, energy, etc…)

How much do we need to produce to meet these needs?

How are we going to produce? Will we need to continue mass production?

Can we tailor and train our 'wants' towards the arts and sciences?

Integrated Planning In Multi Governmental Departments

In order to achieve the suggested goals mentioned above, the government's role is essential. Multi governmental departments need to collaborate in order to achieve these outcomes. As we see in building science, Integrated Design is an effective way to achieve better and more sustainable results. An integrated approach will enable the government to plan and process Sustainable/Conservative Culture goals.

[2] http://www.nel-hydrogen.com/home/docs/If_The_Future_Could_Choose_2.pdf , http://www.byd.com/auto/FeBattery.html

Education

An effective education results in positive behavioral change in students[3]. Without educating today's generation, we cannot change their future behavior. Innovative lessons and a strong educational program can establish a new trend among students, and subsequently a new culture. Sustainable thinking should be at the centre of the educational structure. Consequently, students should start asking themselves, "Where is my position in the future sustainable society?" instead of the question "What will be my career?".

Economy

We need to change our focus from profit to quality. If we can do so, our goal will shift towards achieving happiness and tranquility rather than simply earning more and more money. Can our economy do this?

The method of production can either be centred mass production or distributed man production. Small scale handmade manufacture production requires greater man power (which means more employment) and offers better quality products (the highest quality automobiles are still being built by hand). It also limits the number of produced products naturally.

Small scale manufacturing generally does not need to take place in a central industry area; therefore, the city population can be distributed evenly over the country. This means urban sprawl/ density and over population problems can be solved. This also helps with distributed energy production and energy storage. As a result, it will be easier to establish sustainable communities.

Semi-Distributed Energy Storage (Systems)

"Storing electricity is quite difficult and expensive"[4], however, the technology exists and is already being applied. Using hydrogen to store and transfer electricity seems like the most intelligent way for the long run. However, it is not quite efficient yet; therefore, we need to focus on improving this technology. It may cost money and take some time, but did nuclear technology not have the same problem in the beginning as well? Fe battery[5] is a good complementary technology and is already being used for large scale energy storing applications.

[3] Lesson Notes, Introduction to Education, Akcadag Anatolian Teacher Training High school, Malatya, Turkey 1998
[4] "A Rational Framework for Electricity Policy" Jan Carr
http://www.thinkingpower.ca/PDFs/Governance/JanCarrArticle.pdf
[5] http://www.byd.com/auto/FeBattery.html

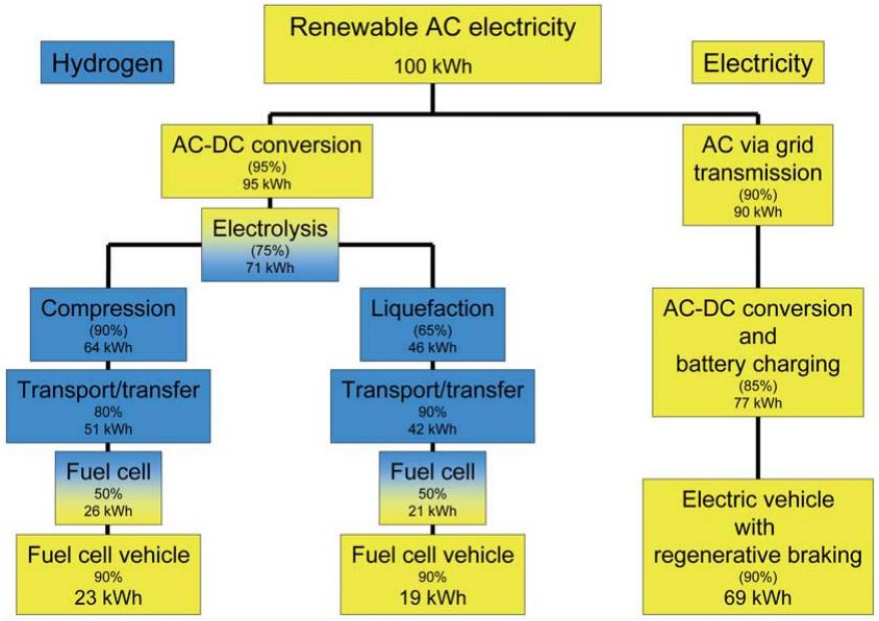

Fig. 9. ***Useful transport energy derived from renewable electricity.***

http://www.fuelcellforum.com/reports/E21.pdf

It can be costly, but which new technology does not have the same problem? The funds needed for this big investment can be obtained from the savings from conservations which will be approximately 10000 MW/yr and also can be obtained from the savings from lower transmission expenses due to distributed energy production.

A national energy storage systems program can also be developed into an export product by the government for Canada. We are not the only ones who are thinking about this future. The European Parliament signed a declaration to establish a Europe-wide **hydrogen-based energy economy** in 2007[6].

[6] http://www.bellona.org/articles/articles_2007/EP_Hyrdodeclaration