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**Official Report
of Debates
(Hansard)**

Wednesday 30 January 2002

**Journal
des débats
(Hansard)**

Mercredi 30 janvier 2002

**Select committee on
alternative fuel sources**

**Comité spécial des sources
de carburants de remplacement**

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LEGISLATIVE ASSEMBLY OF ONTARIO

**SELECT COMMITTEE ON
ALTERNATIVE FUEL SOURCES**

Wednesday 30 January 2002

ASSEMBLÉE LÉGISLATIVE DE L'ONTARIO

**COMITÉ SPÉCIAL DES SOURCES
DE CARBURANTS DE REMPLACEMENT**

Mercredi 30 janvier 2002

The committee met at 1102 in the Crowne Plaza Hotel, Ottawa.

CANADIAN ASSOCIATION FOR
RENEWABLE ENERGIES

The Chair (Mr Doug Galt): We will call to order the select committee on alternative fuel sources here in Ottawa at the Crowne Plaza Hotel.

Our first presenter is Bill Eggertson, executive director, Canadian Association for Renewable Energies. Thank you very much for coming forward. It's much appreciated. We look forward to your presentation. There are 20 minutes set aside for you and you can use that in presentation. What is left over we'll divide between the three caucuses for questions.

Mr Bill Eggertson: Thank you very much, Mr Chairman, and members of the committee. My name is Bill Eggertson. I'm executive director of the Canadian Association for Renewable Energies, a national organization set up in 1997 to promote feasible applications of renewable energy. Obviously, our focus is on national issues, perhaps not as much as it should be on provincial, so we do appreciate the opportunity to dabble in your affairs to the extent possible.

My background is almost 20 years in the renewable energy sector. I started in 1984 as the executive director of the Solar Energy Society of Canada, when a new federal administration decided to cancel Canada's solar energy programs. In the last eight years I've shared my time with the Earth Energy Society of Canada as executive director; that is ground-source heat pumps. I've just finished a contract with the Canadian Solar Industries Association and am currently doing a contract with the Canadian wind energy industry. So I am a generalist in energy policy, an expert in none, but I was actually one of the three Canadians on the advisory panel to the G8 Renewable Energy Task Force that reported to the G8 meeting in Geneva a number of months ago.

Our association's claim to fame was that we started a newsletter called Trends in Renewable Energies back in 1997. It teamed up with our US counterparts about a year ago. We now are the largest electronic newsletter on renewable energy in the world. We have close to 10,000 subscribers. Just before Christmas we celebrated our 1,000th issue of publication. So again, a lot of my focus is from outside of Canada. Much to my dismay—I am a

Canadian and the newsletter was set up to promote how much was going on in Canada about renewables—it became easier to talk about what was going on in other countries and hopefully the Canadians would adopt it.

One final anecdote: our association has actually set up Canada's first and only green hosting Internet service, where we had to move our server out to Calgary, because it was the only province at the time that offered certified green power both from the generation of wind turbines and through the municipal utility ENMAX in Calgary, but we now offer to associations and organizations in the country an opportunity to host your domain service on a wind-powered service based in Calgary.

I will comment very briefly on some of the 65 questions that were contained in your interim report. We're hoping to scramble and get together some written submissions, a little bit more detailed than I will be able to provide today. What I'm hoping to do is to give you the benefit of our association's viewpoints or special interest views so that it helps your committee understand some of the issues that you should be asking some of the other people later on in testimony.

My belief is very clear: renewable energy is the energy of the future in this world. You've had Shell repeatedly enunciate its forecast that by 2050, 50% of the energy in this world will come from renewables. You have BP, which owns the largest solar PV production facility in the world. Even now, companies in Canada like Suncor are dedicating \$100 million—albeit Canadian dollars, it's still real money in many cases—to the support of non-conventional fuels. Obviously, there have been some setbacks: the California crisis, which impacted on Alberta prices; the more recent issue with Enron, which is scaring a number of people away from energy issues. These are setbacks, renewables being a subset of energy. However, it is our very clear belief that Canada and Ontario must start the transition to renewable energy. It's going to come. The question is not how it's going to come, but when. The faster we get on the bandwagon, in our opinion, the better it is for our economy.

Most countries don't have the same energy options that Canada does. We are blessed in this country with a large number of natural resources. Consequently, I think a large number of Canadians, and Ontarians by extension, don't realize that Canada is facing an energy crisis, which puts a very heavy onus on your committee to raise the profile in the provincial assembly as to what needs to

be done and to come up with some very good recommendations to enable the province to move in what we consider the proper direction.

California has shown very clearly that government is frequently the engine of vision down there. A lot of the municipalities in California are the key stakeholders, the clear leaders in the adoption of renewable energy. Up here, because energy is not per se a federal jurisdiction—it is provincial—very few of the provinces, including Ontario, have really done anything. I know of four people in the Ministry of Energy, Science and Technology in Toronto who are involved with renewables. They have no political directive to do anything to support renewables. They certainly have no program budget. They are wonderful bureaucrats doing wonderful stuff, but their hands are tied to a very large degree.

A lot of what we see here in Canada is happening at the municipal level, spearheaded largely by groups like the Federation of Canadian Municipalities and Jack Layton, who is the current elected head of the FCM. We would certainly love to see the province get a little bit more involved in terms of the promotion of renewables.

I'm going to make about six very broad comments in response to your interim report. In your report you frequently mentioned a number of the innovative activities that are taking place in the province, specifically building integrated photovoltaics, where you clad a building in solar panels. You were talking about the federal green power procurement. You're talking about renewable portfolio standards. One of my personal complaints, I guess, is that if we're talking environmental mitigation, adopting an energy source that is good for the environment and therefore adopting renewables because they are good, far too much of the focus in Canada, and I think in your report, has been placed on electricity generation, green power. There are a number of reasons for this and it's natural. Most jurisdictions in the world do it. However, if you're looking for bang for the buck, both in terms of incentives or policy, please do not overlook the impact of renewable energy in space conditioning, meaning space heating, space cooling and water heating.

In Canada there is far more energy—BTUs, gigajoules, whatever measurement you want—used in space conditioning than is used for electricity, but the focus is very frequently on electricity. If you're looking at it from an environmental point of view, a lot of our electricity is generated by nuclear and/or hydraulic, which actually have no GHG emissions, so therefore it is a bit of a moot issue, as opposed to space conditioning where most of the residential buildings and most of the commercial-institutional buildings are heated and cooled and water-heated using natural gas, oil, propane or whatever. So it's an appeal to this committee to not overlook the space conditioning market as you consider your report.

1110

I should mention that the two organizations with which I'm involved, both the Canadian Association for Renewable Energies and the Earth Energy Society, have teamed up with the Canadian Solar Industries Asso-

ciation and two biomass groups. We have formed a partnership called the GreenHeat partnership. For reference, we've got a preliminary Web page at greenheat.org. The intent here is to focus far more attention on space conditioning than on electricity, based on the fact that if you look at residential and institutional-commercial institutions in Canada, they emit 65 megatons a year of carbon dioxide alone just for heating and cooling and water heating in those two sectors. Approximately three times more energy is used for those applications than for electricity. So I'm not downgrading the need for green electricity. We are a society that is electrifying very heavily. Electricity is very important and, certainly, go green whenever you can, but do not ignore the space conditioning.

The GreenHeat partnership has been set up to basically replicate the federal green power procurement. What we're trying to do is rush our submission into the climate change to say that the federal government should obtain 20% of its space conditioning in federal facilities from the four technologies that are recognized by the federal government as renewable energy space conditioning technologies, those being earth energy, solar thermal air, solar thermal water and advanced biomass. So again, the appeal to this committee is to consider that same aspect.

My second comment: in your interim report, you said there was considerable uncertainty and debate over the definition of green power and you wanted to hear how Ontarians define it. We would appeal that you wait until March 7, the expiration of the Environment Canada draft definition, which is out for public comment right now through the EcoLogo/Terra Choice environmental choice program. The end result of that will be a federal Environment-Canada-defined, low-impact renewable energy. Even though we may not agree 100% with what we expect the Environment Canada definition to be, we would certainly encourage the province to embrace whatever they come out with, simply to avoid inconsistency across the country. If Ontario takes the lead and says, "Gosh, whatever the feds have called it, we'll define it the same way," that stops other provinces from considering their own definitions. I have been involved with some activities in the United States where you have different specific photovoltaic certification levels in different states, and it's a mess down there. We would hate to see the same thing happen up here in Canada.

The third point is an underscoring of your intent expressed in the interim report that any goals or policies you implement or recommend be incremental and realizable. The US experience has shown that a lot of people will say they want green power, they want renewable energy; however, when the programs are introduced, a lot less people pick up the programs and pay the premium than had been expected. We are paying a very hefty premium for our green hosting service out in Calgary. I was expecting people to pound on my door. It has not happened. Very few environmental groups are hosted on the green Web site that we offer. Even the Canadian

Wind Energy Association, whose turbines are generating the electricity to power the Internet server, has refused to basically move over to our domain. So it's a little bit of a warning. As I'm sure you, as politicians, have realized, people say one thing but they don't always adopt it in the second.

Another example is Earth Energy. In a residential installation, you're talking a six- to eight-year simple payback period. That is far too long for most consumers. They don't understand life cycle costing. It's the sticker shock that turns them off. So for any policies or whatever, if you can reduce the first cost, it's much better than many other policies, simply because it gets you over that very strong hurdle or barrier.

Another point is that obviously the government has options in terms of both monetary and non-monetary incentives. You've referenced the renewable portfolio standards, the green power procurement, the various incentives. From our position, we prefer non-monetary incentives, partly because monetary incentives have to end. The predecessor to the Earth Energy group had actually had a very long-standing program with Ontario Hydro to install ground-source heat pumps. Ontario Hydro gave a \$2,000 rebate. Ontario Hydro had to stop the program after four years, I believe it was. The perception among consumers was, "Oh, something is wrong with the technology."

There was nothing wrong with the technology; the government trough ran dry. When the federal government offered Earth Energy an incentive under the Renewable Energy Deployment Initiative program, the REDI program, our industry took an unanimous decision to say, "Thanks, but no thanks." We did not want an incentive. We're the only one of the four technologies that does not receive a kickback or a bribe, call it what you will, because we knew that the feds would not be able to continue it forever and we did not want the roller coaster ride to go up again, which is beautiful for business, wonderful for commerce, but when it ends—I think in Ontario, when that program ended with Ontario Hydro, we didn't sell a single system for about two years. That hurts. So our recommendation is, stay away from bribing us with our own tax money incentives.

We agree with you totally on energy efficiency and conservation and the fact that this committee should be looking at it. Energy efficiency and conservation is a key to renewables. The trick is to get your demand down to the lowest level possible; then any of our technologies can far more feasibly meet your supply requirement. We would hate to see a policy saying that solar photovoltaics will be the energy source for the steel producers in Hamilton—not feasible.

Earth Energy people: if you've got a leaky house like a log cabin or anything that is not an energy-tight operation, an Earth Energy dealer will not even talk to you. It's not our intent to charge you—well, I suppose some of our dealers would actually love to charge you—to install a large number of loops, but it's stupid if you're going to then be heating the outside.

So as I say, conservation. Ratchet down your demand to the lowest level possible. Eventually, though, you will need some energy, either for electricity or space conditioning. As much as possible, in our opinion, that should come from renewables.

The final point on this one is that obviously I'm hoping this committee has looked at a number of studies, primarily US and European-based—very little has been done in Canada—showing the benefits from renewable energy in terms of price stability, job creation and environmental benefits. They are quite profligate down in the United States and if you ever needed a reference, I could probably pull off about 50 studies that have been done by reputable groups: the Union of Concerned Scientists, the Renewable Energy Policy Project-Crest operation. Purdue has just come out with a study. A study currently in Congress just came out last week by a Democratic pollster, to be fair. It says that 69% of Americans believe more jobs would be created through federal support for renewable energy than would be created through drilling in the Arctic reserve—which of course is part of President Bush's energy policy—versus 18% of the respondents who thought that drilling in the Arctic would create more than the renewables. That's a key point of the President's energy policy, and he's received support from the Teamsters and stuff like that, but most Americans seem to believe—and the Sierra Club said the President is obviously out of step—that renewables do create more jobs per energy delivered than any of the other options. So whenever we talk to government, I turn the phrase, "If you come, they will build it." If there is a market for it, the industry will come in and set up whatever production facilities are required to do it.

I always believe that government should be congratulated when they come out with a good document. Certainly your committee is to be commended on the interim report where you talk about your broad consultation and the fact that you don't wish to focus on a particular energy technology. I agree with you 100%. There is no silver bullet; you'll never come up with it. The issue is to come out with a diversification or a balance of technologies. Obviously, we think renewables have a large role to play in that diversified match.

Some of the questions you pose in your report, such as, "What percentage of what fuel source would contribute what to the energy mix?" are difficult to answer without knowing what it is the province would do. Obviously, if you were to pass a regulation or legislation saying all energy technologies must be renewable by Tuesday afternoon, that's one answer. Depending on what it is that government sets, it's a difficult one to respond to. Certainly, if there's time for questions, I can perhaps elucidate on that a little bit.

But what we'd love to see this committee recommend or come out with is some type of econometric model that allows you to plug in a lot of these parameters, that if you increase the tax rebate and you have an RPS for this and you do that and the other, that would have this type of output. I've never seen it in Canada; I don't believe a

model like that exists up here. There have been some good attempts down in the United States and it may be something worth the committee investigating.

Your report talks about the benefit of renewable energy to the grid. Again, you're talking grid electricity. There are many applications for renewables in off-grid applications and of course for space conditioning as well. Among the major benefits of renewables are their local contribution, their local job creation and their energy security factors, all of which need to be factored into your report.

1120

One objection is when you use the term "cost," such as, "What would wind cost in relation to others?" I'd love this committee to define your cost. For example, we have never really costed a lot of the life cycle costs and security costs and health costs from some of the conventional sources, and I know that we in the renewable energy sector are always very sensitive when people say, "Well, how much more will wind cost?" More than what? What is the baseline against which we are being compared? Also, what would incentives or subsidies cost the government?

I throw it back at you: what would it cost our economy and our society in Ontario if you don't promote renewable energy or cleaner energy options? At some point in the future, if we run out of conventionals or if we start killing more and more people with the use of fossil fuels, that is a cost, and you need to balance those ultimate costs—hypothetical costs, perhaps—against the costs we are factoring into our equation.

You said, "Are there any downsides for renewables?" There are a lot of downsides, and I don't think any professional practitioner within the renewable energy sector would try to deny it. However, we do try to keep the attention focused on legitimate downsides. Wind has always suffered from the fact that they killed a number of raptors down in the Altamont Pass in California when the first turbines went up. Turbines were put in a migratory bird path. They had fast-moving turbine blades. The raptors, probably not one of the brightest bird species going, went into the blades and were chopped up. They have now evolved to larger, slower-turning blades, and they are not in the migratory paths. It would take a really stupid bird to mix itself up in turbine blades, but the industry is still criticized for this.

When the Toronto Renewable Energy Co-operative wanted to get their application for the CNE site and the Toronto Islands site for turbines, they had to go through a very exhaustive analysis, and that was one of the questions, basically: "How much wildlife will you kill?" They were able to go around to the downtown Toronto high-rises, the TD towers and stuff like that, and there were hundreds of birds that whacked themselves out every year cracking into the towers. But they never said, "Let's take down the TD towers," simply because they were killing birds. That's the type of focus.

We have a downside. One dead raptor is far too many. I think the studies from Europe show that each turbine

kills an average of one and one-half birds per year. So my cats are already equivalent to about 20 turbines. Maybe I should get rid of my cats. If you're going to concentrate on downsides, we do have some, but please try to keep them to the legitimate downsides and not some of the red herrings like turbine blades.

I'm going to skim very quickly and just throw back some comments on your public policy questions. Obviously we totally support the development of a provincial strategy on renewable energy. You need to define what you mean by "renewable energy," you need to identify what your feasible applications and options in the province are and then set some type of goal, whether it's a renewable portfolio standard or government procurement etc, and do it; perhaps a set-aside for some of the longer-term technologies, things such as BC Hydro is now investigating, ocean current energy on Vancouver Island.

The Chair: Could I just interrupt for a half second? We have arrived at the 20-minute point. I need to get permission from my committee for you to extend. Tremendous information, but is the committee comfortable that we—

Mr Steve Gilchrist (Scarborough East): Recognizing that there is a cancellation at 11:40, perhaps we could split the difference and add another 10 minute here.

The Chair: Great. He's zeroing in so much on our report, and the information is just excellent. My apologies for interrupting, but I do have rules I have to follow as Chair. If the committee is comfortable, so am I.

Mr Eggertson: I respect that and thank you very much, Mr Chairman. What I'll try to do is finish in about two minutes, so that I can entertain any questions, because I think that would be more relevant.

Very quickly, keep your specific financial incentives to a minimum. Most of the money that is developing the renewable energy sector in the United States is private, and by that I mean system benefits, charges and other foundations, which are heavily involved there. You're probably aware of the San Francisco bond that was passed by the community last October or November, I think, a \$100-million bond, and this was in US dollars, so we're talking real money here. Your committee could recommend some creative activities where perhaps the provincial Legislature would empower municipalities to enact the same type of operation, so it doesn't necessarily require provincial tax dollars. As a citizen, I'm very concerned about your doing that, but I think there are ways of doing it other than bribing us with our own tax dollars, as I said before.

In the absence of a carbon tax, which of course is a no-no term in Canada, obviously we would encourage your committee and the province to set a date for some type of transition or increased penetration of renewables. Show that the province is serious. We could have a debate up until that date, and we probably would, but nonetheless at least we would hope the province does something to go for that.

Any efforts to compute the full life cycle costing are wonderful. As I mentioned with Earth Energy, if people were to understand life cycle costing, renewables win in virtually every application.

We would certainly encourage a provincial green power procurement, including the MUSH sector, and certainly both electricity and space conditioning. Don't ignore where you can get the benefits. In terms of supporting a lead ministry being set up, a number of jurisdictions have already set this up, like India, which has a ministry for non-conventional energies.

Many of the people in our sector aren't comfortable with the renewable energy group at Natural Resources Canada because it's in under the electricity branch, which means you've got a director at NRCan who is responsible for renewable energy and electricity in Canada. We don't necessarily think we get a full share of the gentleman's attention. So we're worried about ghettoizing if you were to set up a specific government ministry to handle renewable energy.

Researching programs: most of our technologies are already commercially ready. All we need is a market in order to sell the technology to consumers. Fuel cells are a slightly different case. Fuel cells are not an energy source; they are an energy-delivery technology. We fully support fuel cells because of the fact that renewables can be used quite effectively to split the water to make the hydrogen to stack the fuel cells. Renewable technologies are quite well suited to the application of fuel cells, and we also love them because it means we are shaking up the status quo. When people start looking at fuel cells, they also, by extension, start looking at other technologies, like renewables.

In conclusion, why should Ontario adopt renewable energies? Profit. A lot of money can be made in this. If you look at Denmark, the largest single industry in Denmark is now wind turbines. Japan is making a lot of bucks off photovoltaics. A large number of companies have stayed out of Ontario simply because there is no market here.

The provincial and federal governments are going to back the ITER fusion reactor because it attracts qualified, high-quality, high-value employees. It would be the same in renewables. If you start making it an integral part of an industrial strategy, again, they will come.

Environmental benefits are extremely strong. I'm not even going to discuss this, because I imagine you've been having that discussion. Renewable energy is basically what the people want.

Also, we've said before that for every joule or watt of energy we can displace in this province, it means we can export it and it becomes a revenue source. If we sell it to the Americans, it allows them to reduce their reliance on oil, which has implications for the whole issue of terrorism and their foreign policy. We encourage Canada to save our conventional energy. If necessary, ship it to addicts like the Americans and help them out of their current situation.

We're certainly not advocating a demise of fossil fuels. We will always need them. Ontario, as you know, does have an image as a bit of a dirty province because of the amount of industry we have. If the provincial government were to take a very strong stance supporting renewable, clean energy, I think it would give the province a wonderful image makeover. We should keep the petrochemicals for things like Velcro and polyester and all of the other items that consumers in Canada and Ontario use very heavily.

We view the committee work as an ideal opportunity for you to make recommendations to the Legislature which will have a long-standing potential impact on the province and, by extension, the country. Timing is critical, and we certainly appreciate the open mind that you have displayed in your interim report, in terms of not closing any doors, keeping everything open. We wish you the best of luck in your deliberations and look forward to your final report.

Thank you very much for the opportunity to address your committee.

The Chair: Thank you. Particularly, you zeroed in on the report, and that's what we were really looking for in this round.

Unless anybody objects, I'm going to give three minutes to each of the caucuses for questions, and then we'll go from there. But I'd really encourage you to address in writing the 65 policy concerns that we have. We look forward to that. Who would like to start off? Dr Bountrogianni.

Mrs Marie Bountrogianni (Hamilton Mountain): Thank you for your presentation. It was excellent. I went into your green hosting Internet service last night, and I wish I had done that earlier. It's an excellent site. Thank you.

Given what you just said about monetary initiatives, on your site—and I want you to comment on this; perhaps this isn't what you meant when you said, "Stay away from monetary."

"A Canadian biomass company, DynaMotive Europe, a subsidiary of DynaMotive Technologies ... received one of Britain's largest grants to develop its process. It received £1.16 million from the UK Department of Trade & Industry to enable commercial production testing of an integrated BioOil and electricity generating plant in the U.K."

I actually stroked that last night to ask you, is that what you want us to do here, give those kinds of grants to companies here? I'm not sure with your comments. Maybe you can comment on that.

1130

Mr Eggertson: I have to be careful, because a number of our members in various technologies do like and do rely on government support. So I am not saying the government should not give incentives if obviously necessary, and the more nascent the technology, like a fuel cell or a biogas operation—many of the innovative technologies do need financial support and you're either going to get it from government or from some venture

capital. There are pros and cons to each of the operations. What we're worried about is a consumer incentive, where you pay people in Ontario X dollars to do what they should be doing, but at some point you're going to stop paying us, because you have to, and that has a bit of an immediate impact on consumer perceptions. So if you were to do something—we've never advocated a straight cash kickback, which is how the Earth Energy incentive worked. People bought the units for the \$2,000 grant; they didn't even know what they were buying. We don't want to walk into that trap again.

Mrs Bountrogianni: Right, an informed public. Do I have time for one quick one?

The Chair: You have half a minute.

Mrs Bountrogianni: Again on your Web site you cited that the Canadian government is reviewing the definition of a test wind turbine which may lead to changes under federal tax law. Are you aware of the process of that and where that's at?

Mr Eggertson: I know they are dealing with finance and Revenue Canada, and it's simply that wind turbines are eligible for the conservation renewable energy expense. I'm not a tax expert. They get something based on one application. They want to expand the application, because most wind turbine manufacturers and users tend to be small companies. They can't use the flow-through provision. So there's a whole accelerated capital cost depreciation, which is largely of no use to the actual users because they're not in a position to handle it. They want to basically expand the definition so that they can capture some of that revenue.

Mr John Hastings (Etobicoke North): Sir, thank you for coming in. My first question would relate to your views on grants. You're saying that some organizations in renewables are reliant on grants as the best way of giving them a launch. But if you look at the history of grants from the solar industry perspective in Canada, and probably other renewables in the 1970s and 1980s, where did it get the solar industry? At one time there were up to 40 companies; now in Ontario I think they're down to one.

Mr Eggertson: There is a very chequered history, as obviously you are aware. There were companies that were abusing the grants. Some companies ended up in court as a result of it. You need better monitoring. I guess it's like any government research, tax incentive, grants, whatever: you offer something and somebody is smart enough to figure out the loophole and scam you. You don't want to set it up so that there are no scams, because then your enforcement and administration costs outweigh the value of the grant. But certainly if you have some type of incentive—and I'll use the term "grant" or whatever—just make sure that you get your money's worth out of it. Have some benchmarks. Advance the money only when they reach milestones.

I understand that the practice is tighter down in the United States, where you meet actual milestones before the next cheque is cut. Up here, Canadians tend to be a little bit more benevolent. Again, I'm ambivalent making

this comment, because I've worked with groups that have received government funding and we swear about how long it's taking the money to come in and it's drying up our cash flow etc. It's just—please be careful.

Mr Hastings: Are you familiar with the Australian renewable energy scene?

Mr Eggertson: Fairly.

Mr Hastings: Do you think there is good material from an industry perspective, a university perspective, from the state and commonwealth government's perspective? They have done a number of interesting things down there to create an industry in renewables: solar, wind, what have you, especially solar.

Mr Eggertson: I would submit that the Australian government, which has the same messed-up confederation as Canada has, has probably been more successful in promoting it, because they have set up the SEDA and they do have state governments which are promoting it. They are more committed to developing their industry, I think, than Canada is.

Mr Hastings: Do you think Canada, the federal government, should look at Australia as an effective model, being a federal state?

Mr Eggertson: Yes.

Mr Hastings: We're not getting much leadership from them.

Mr Eggertson: We have always not criticized the federal government, because we recognize it is not their jurisdiction to get involved in renewables and we realize that when they put their neck out to support renewables, if the provinces wanted to, you could slap their wrist, simply because it's not really their job. So we're always conscious of not getting into the whole constitutional push and pull.

Mr Hastings: Then isn't there a conflict here in terms of having to be resolved? If we sign the Kyoto agreement and implement it, aren't they going to have to take a federal policy leadership role in terms of the C carbon emissions and all that?

Mr Eggertson: Yes, but they have to work with you at the provincial level, so you have to work together on that. You're right. They are signing it, you're largely implementing it, and that's why you have to be friends.

Mr Hastings: The new federalism.

The Chair: Thank you ever so kindly for your thoughtful and informative presentation. I am sure that our researchers will be contacting you in the future.

Mr Eggertson: We're open to any follow-up questions from your committee, sir.

The Chair: Super. We really appreciate your coming forward.

PLANETARY ASSOCIATION
FOR CLEAN ENERGY INC

The Chair: We'll move on to our next one, the Planetary Association for Clean Energy, Mr Andrew Michrowski, president. Thank you very much for coming forward. For the sake of Hansard, please state your name.

Also, as you have heard, there's 20 minutes for your presentation and what's left over we'll divide between the caucuses.

Dr Andrew Michrowski: My name is Andrew Michrowski and I'm president of the Planetary Association for Clean Energy. The paper I have given you a copy of is probably longer than the talk that I should give. I'll try to glide over it and leave as much room as possible for questions. This may be a novelty to all of you. That's why there are some specifics in the printed format.

We're discussing the possibility of using water as a fuel, and this could have implications, if so desired, on many levels in Ontario. Our association is an international, interdisciplinary, collaborate network of advanced scientific thinking, founded in 1975 and based in Ottawa. We would like to bring to your attention the potential technological choices to Ontario offered by the systematic use of water as a fuel.

Our network has followed and facilitated one such system since its inception: Brown's Gas. Because so much research has been conducted with this technology, it is possible to describe many office applications with the specifics. We believe that it is in the economical and political interest of Ontario to consider some of these applications in this decade.

Brown's Gas is water separated into its two constituents by an advanced alkaline electrolysis process in a way that allows them to be mixed together under pressure and to be burned together and safely in a 2-to-1 proportion. The process results in a gas that contains ionic hydrogen and oxygen—of course, molecular too and hydroxy as well. When sparked the gas recombines safely, by implosion, back to water, collapsing in a vacuum-water ratio of 1,886 units to 1.

There are three decades of research with this, and you'll see there's a list of 26 applications. At this time, just for your interest as I'm getting off the document, the one that we're working the most on successfully with Atomic Energy of Canada Ltd is for nuclear waste decontamination. Within 10 seconds it is possible to reduce the radioactivity of nuclear materials down to 4% of their previous levels, which is a very important thing which would mean that we could inexpensively—especially in Ontario; this is a big Ontario problem—decontaminate nuclear reactors when they're decommissioned.

In this presentation, we'll focus only those applications that come under the purview of your committee's mandate and interim findings.

Brown's Gas generators and some of the applications were first developed and manufactured in Australia. In the late 1970s, production was transferred to the People's Republic of China at the inducement of the government, resulting in mass production of generators for national distribution—by the way, by a company as large as General Electric. That's Norinco, which is the electrical appliance company, if you wish, of China.

The important Chinese applications, besides welding and brazing, include water desalination, medical and

toxic waste management and destruction, pharmaceutical production applications and material hardening.

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In 1996, the Chinese re-invited Yull Brown to build a Brown's Gas system for deployment in cars. That was after the terrible smogs of Beijing and Shanghai; the Chinese said, "There must be a better way than the normal combustion system." This particular technology transfer was interrupted in part due to ill health when Yull Brown decided to return to his homeland, Australia, to spend the last months of his life.

Through the auspices of our association's network, Yull Brown made arrangements for additional manufacturing facilities to produce generators and applications that would meet North American and European Union standards here in Canada. One novel Canadian application now underway is for the synthesis of heavy crude and oil sands. Our Canadian colleagues are now successfully investigating applications in automobile engines and in optimizing the combustion of other fuels such as wood, coal, natural gas etc into near-complete burn and minimal emissions.

There is also a very convincing case, but not yet test-proven on a large scale, for using Brown's Gas for the purpose of storing energy in such situations as excess hydro capacity and wind and solar energy by producing Brown's Gas from electrolysis during slack demand periods and then using Brown's Gas to produce electricity on demand during high consumption periods. The efficiencies in both phases are very exciting. The efficiency of electrolysis is near 99%, which can't be better, and the use of Brown's Gas to produce energy is on a level around 80%.

The ready and limitless availability of water makes Brown's Gas the best carrier for solar energy and other alternative energy sources developed to this time. It has higher energy-conversion efficiency than hydrogen alone, which is conventionally considered to possess the highest conversion efficiency as a fuel. Brown's Gas is non-polluting; it does not even emit the nitrogen oxides which result from hydrogen burning. It is naturally recyclable. The product of its burning is pure water. Brown's Gas is adaptable, like hydrogen, to most of the existing energy utilization technologies without any modifications.

I would like to bring in an aside here that one of the world's experts on hydrogen economy, a member of our association and former dean of chemistry at ANM University, Professor Pappas, stated that if hydrogen economy were ever to be implemented, Brown's Gas would be the best choice.

Just to give you an idea, and this is only for the purpose of illustration of how Brown's Gas can be used, this analysis was actually done for the Canada Mortgage and Housing Corp when they wanted to make a stand-alone healthy house in Toronto that would not depend on hydro, water or the sewer system. It was built, by the way.

You can have heat by attaching catalytic heaters to a supply of Brown's Gas, from a generator, as any gas. That can be used for elements and for space heating. So it's catalytic combustion, just the passage of gas. Then you can have cooling. Water cooling and space cooling requirements can be provided by compressing the gas or by venting the result directly into the medium, or to be put in the space to be cooled. The other way, of course, is to expose the Brown's Gas flame to circulating Freon gas tubing, not unlike the old method of applying lit gas lamps with paraffin wicks in the pioneer Frigidaires.

You can also have clean water if necessary; that is, you use the Brown's Gas to get back the water, but cleaner.

The other use, of course, is to use it as an energy storage system. One litre of water with about five kilowatts' input generates 1,866 litres of Brown's Gas, which can be released to a chamber located up to 10 metres above floor height and which is linked by a flexible pipe connected to a water basin subject to ambient atmospheric pressure. When that chamber is ignited with sparks, it creates a vacuum by implosion, and that would trigger the raising of 1,866 litres of water up to the height of 10 metres, and now you can have a mini-hydroelectric facility even in most residential apartment buildings, for example. So you can have quite a bit of electricity available, even at major inefficiencies, that could be used to run the apartment building.

Such a system—not for an apartment building but for a smaller house in Australia—has been operated for 10 years, and it was found that Brown's Gas storage is over 98% efficient, as are current hydrogen/oxygen tank storage systems. However, it is found that it is not worthwhile in such circumstances just to have bottled gas but to have the generator on the spot. The same thing applies to hydrogen. There are too many problems associated with operating the tanks.

I went down to a house with a solar cell system where you have a generator in the house that would take the excess power from solar or wind energy to be stored in Brown's Gas and then you'd have all these things: heating, cooling, clean water, energy stored and so on. This fits well with certain initiatives in northern Ontario, where the federal government is now installing houses in isolated communities, to assure problem-free energy production, heating, air venting, clean water—great water—and storage treatment, all in one unit. Brown's Gas generators are small and not noisy. They can do that work very neatly.

Of course the scope of your committee is not to cover only special housing or isolated regions. There is the question of the big picture. Existing combustion technology can be boosted from low efficiency to extremely high efficiency by spraying Brown's Gas onto flames. That's an application that already exists in China for waste and medical waste incinerators. Large-scale application of this can mean big advantages to the provincial economy, which essentially is dependent on an imported fuel supply.

A similar context exists in Germany, where an economic study by the University of Hagen—and I have deposited one sample of that study—showed that they apply low-cost Brown's Gas nationally for heat and electricity generation in both centralized and decentralized settings in Germany. As you know, in Germany they have lots of these heating facilities for apartment blocks and so on, or even for entire neighbourhoods, but there's also a demand for autonomous services—like in the mountains, for example—and for the transportation sector.

That study showed that a phased implementation of such a system over 10 years would be beneficial in terms of the national budget because of decreased expenditures related to the environment, and it would also lead to an increase in employment. It would be so inexpensive to run cars that people would be using cars more, and this was seen as bad in Germany. In Germany that's a tremendous problem. In fact, the country is relatively small for the population, and just thinking they would have to build more 400 series highways was enough to make the government say, "My God, we might be saving something, but we may have to build more highways to take care of greater car use." That is not necessarily the case for Ontario. Of course, they saw the economy would be stimulated because there would be greater purchasing power. We expect a similar and desirable consequence for Ontario.

Let's go back to the electrolyzers. We have conversion efficiencies anywhere from 90% to 95% for electrolysis in the real-world setting. When you start selling these things, the efficiency decreases on site, in context, from 99%. We also know that the theoretical energy level of hydrogen/oxygen gas is around 50,000 BTUs per pound. But Brown's Gas has at least 66,000 BTUs per pound, and the inventor found a way of getting it up to 210,000 BTUs, which is almost at a nuclear level. If just 80% of this energy can be recaptured, it will be a significant improvement over the main problem with all variable-power input systems: energy storage—solar, wind, tidal etc; of course, tidal is not important to Ontario. The gas storage development is of a very high priority for future developmental work in this area, yet experience suggests that the off-the-shelf liquid petroleum gas technology storage system is adaptable to Brown's Gas. That means we do not have to reinvent the entire problem of storing the gas, because the LPG system applies as is.

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Brown's Gas can also be used, if it were desired, to increase the efficiency of fuel cells. This may be of some interest for variable-power input hydroelectric plants and wind energy farms.

There's also the possibility—this has never been tested, but was thought through by a major engineering firm in the United States—of using Brown's Gas to energize magnetohydrodynamic systems; that is, an electrical plant of no moving parts. So MHD would convert hot gases directly into electricity. The temperatures required for such a thing can be obtained with

Brown's Gas. The prediction is that, in using Brown's Gas, you would have a 20% overall improvement over a conventional system.

This raises a very interesting situation. Sooner or later we'll have to get rid of nuclear power plants in Ontario. Ontario has a very high density of them. You can see a situation where Brown's Gas could be used to make sure these plants are no longer radioactive very quickly—all the concrete in the whole thing becomes very radioactive. So you can clean it up and then you can use the same shell and use that facility with probably no new capital costs and now have it produce electricity with Brown's Gas instead. Water, which is always near a nuclear power plant, would be the fuel. That would certainly pay, I think, for Ontario, whatever the company and the power generation that it has for these plants.

The other possibility of a new industry for Ontario is that there is such a thing, instead of using a normal combustion engine, an optimal engine that will work on Brown's Gas, and that is a push-pull configuration. The normal combustion engine tries to use explosion to fight against atmospheric pressure to get that piston moving. You can have another piston that would just collapse into a vacuum by sparking the gas, and that would now have a great advantage, because atmospheric pressure would actually be pushing the other piston. So it would be a three-cylinder radial engine that could work on that basis, and we think it would have very good emission characteristics and a low vibration during operation.

It may interest you to know that Yull Brown drove a number of cars with a variety of internal combustion engines. These were tested, and he came out officially with 1,000 miles in the Outback of Australia on one gallon of water, which shows you how the BTU content of Brown's Gas is so much superior to gasoline or all those things. Of course, this sounded incredible, so the best electronics magazine in Australia, Electronics Australia, tested this in all their staff cars and were able to, with very little modification, run those cars on Brown's Gas.

The Chair: May I just interrupt for half a second? We're a little over the 20-minute mark.

Dr Michrowski: I'm sorry about that.

The Chair: Maybe you could wind up in one or two minutes and then, with the committee's permission, I'll give one or two minutes per caucus.

Dr Michrowski: Thank you, sir. So the cars had no emissions, they were cool, they would last longer, and of course the exhaust was just warm steam.

You see the statistics. Basically, it turns out that a small gasoline car in Ontario costs about two cents a kilometre to operate, an electric car would cost about a cent a kilometre, but a Brown's Gas full-size car would run at about 0.13 cents per kilometre.

I'm not going to go further. All I can say is that there are already certain Ontario citizens—usually people who have the courage to do this, like lawyers and doctors—who run cars on Brown's Gas. And the unit that does it is probably as big as the 1.5-litre Pepsi-Cola or Coke bottle.

That's how big the Brown's Gas generator has to be to run a car. So that would be of interest to you to know.

I talked about agriculture applications further along.

The last thing I'd like to say is that if it's so desired, our collaborative network worldwide would be very happy to co-operate with the government of Ontario to get through any technology transfer that you may wish. That's it.

The Chair: We'll give a minute to each of the caucuses. The government side?

Mr Gilchrist: I'm just struck by trying to grasp very quickly here the technical side of the product—

Dr Michrowski: It's new.

Mr Gilchrist:—and discussion about monoatomic versus diatomic hydrogen and oxygen. Going back to my chemistry class, I'm struck how gases that just normally do not exist in nature, and even when created as a result in this case of the use of a catalyst, would not then in and of themselves want to recombine in a normal state. What keeps the hydrogen and the oxygen from doing what hydrogen and oxygen—they told us at school—always do?

Dr Michrowski: OK, let me explain to you. This is not the only way, but the classical way, the way the Chinese opted to do it, is that you have a cell and you have sheets of metal, and on one side—of course you'll have current going through, direct current, polarizing each sheet. And this is all immersed in water. So out of one will come oxygen; the other one will be hydrogen. But they bubble, bubble, bubble. As a matter of fact, I've seen quite a few generators which are totally Plexiglas; you could see right through. You can see what happens. They eventually do merge, and then you have basically a soup.

You know, when I told you that you can have Brown's Gas up to 210,000 BTUs, the secret of that is partially in the kind of circuitry that you have, what kind of pulsation and type of wave forms you have, but also in how you're allowing this soup to be there and how fresh is the gas that you're using when you want it. So there are all kinds of problems of an engineering type. For example, just to tell you the kind of problems people have had when they tried to imitate Brown's Gas is that the bubbling just becomes like foam and then it's hopeless. You want it to be like bubbles of something that is not a foam-like type of thing and can be circulating.

But in these mixtures you have all kinds of situations, and some we have now been able—which is not easy, by the way, to make the spectroscopic analysis. What the hell do you have there? Because you do normally expect just to have the hydrogen molecules and the oxygen molecules—and they do appear—but you also have these different types—and there are three types possible—of hydrogen. There is tritium, for example, and so on. And they can be in a very short-lived time too.

But the normal gas that is not exotic, you know, the 66,000 BTUs, is very simple and is very straightforward. Just very little of the other stuff, yes.

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Mr James J. Bradley (St Catharines): My quick question, because I know I have only a minute, is regarding what kind of specific commitment you have from Atomic Energy of Canada for the use of Brown's Gas.

Dr Michrowski: We have an agreement with them. First of all, one of our members has already, for a year and a half, perfected the system. Basically, let's say this is a radioactive material and you have a Brown's Gas flame and you don't know anything—just chance. You're not going to reduce radioactivity more than 60%, just the interplay. It takes time and effort to find the best environmental context, if you wish, for the process and the durability of the flame—you know, things start moving and spark all over and so on—to assure that this does get to the optimal. It took the Atomic Energy of Canada scientist—who, by the way, is responsible for the Chalk River plant itself; that's his job—about nine months to come to the situation where you get about 4% to 5% radioactivity left over. This was so impressive that the principal scientists of Atomic Energy of Canada decided to go forward, and any week now we expect to have the tests on the real thing, real cobalt rods, not just small pieces and chunks and so on, where we have had good work. Of course, that's a commitment where we've used about \$200,000 just for the laboratory setting and all to think it through, and we hope to see good results.

We know that Yull Brown did that for the Chinese already. The plant where he made the first generators was adjacent to the nuclear facility the Chinese have for both military and commercial purposes. There, Yull worked successfully on uranium and plutonium, not just cobalt, and of course radium. The Chinese reported on this way back, about six years ago, if I remember correctly.

The Chair: Thank you very much. We appreciate your coming forward with this interesting technology.

WHITMAN WRIGHT

The Chair: Our next delegate this morning is Mr Whitman Wright. Mr Wright, we have 10 minutes for individuals, so there is a total of 10 minutes for your presentation. Please state your name for the sake of Hansard.

Mr Whitman Wright: My name is Whitman Wright. Since I've only got 10 minutes and the topics I will be discussing are complex, I think I'd better start making use of those 10 minutes right now.

I am a retired civil engineer, a retired university professor.

I have been in the hospital for about 10 months, and this has affected my speech a certain amount, but I'll do my best. I hope you can bear with me.

When I was a young man, I designed the movable bridges for the St Lawrence Seaway. Later I had some experience moving radioactive material for the nuclear industry. I've also had extensive experience with the

Canadian Standards Association developing standards for the Canadian computer industry.

One thing our profession actively encourages is a readiness for us to attempt to look into the future and visualize the long-term consequences of our actions. I suggested this idea to my wife and said, "How would it work if I tried to visualize what the young lady sitting next to me would be like in another 50 years?" She did not want to pursue that topic.

My contact with the Ontario search for alternative energy sources began when I was watching television and became aware of the interest. I was already aware of the problem because in Ottawa, working with a small group of people who were concerned with the adequacy of our planet to handle the increasing population, we made an attempt to look into what the planet was capable of and what was being expected of it. We were not entirely happy with what we saw.

In the last 100 years—and I've lived most of that 100 years—the global population has multiplied by a factor of almost four; not two, but four. You can imagine the consequences. If we look around in the shopping mall and the buildings built in Ottawa, we can see the consequences. People have come out from all parts of the world and are looking for a place where they can live and enjoy the good things of life, and they look to Ontario. We in Ontario have to provide for these people. This requires energy, and lots of it. The magnitude of the demand is now overwhelming our conventional energy sources. We can't look to Niagara Falls any more to supply all of our energy needs. This goes on and on. We in Ottawa have to deal with the new congestion on our highways, and something that we used to call Winterlude, we now call Waterlude. The government of Ontario has quite rightly decided to look ahead for new energy sources. Whether it can find these sources and whether they will be affordable is another matter.

The two obvious potential sources seem to be wind and solar. We've heard of both of these. I couldn't really figure out what the gentleman preceding me was talking about; maybe you people can. That's my problem—I'm having trouble speaking, but I couldn't figure that out. We have received glowing accounts about how well wind and solar energy are working in Europe. We are encouraged to go the same way. We do wonder whether these two power sources, where the technology is known and could be implemented, would be adequate for the gap that is going to exist in the future between our ability to generate energy and the desire to use it. There is room for improvement. The technologies are reasonably well known. I have not personally examined these technologies in great detail, but I know this could be done, and the cost probably could be manageable. If it were otherwise, I suspect Ontario would not be asking us to come up with answers; they would have the answers themselves.

One of the advantages of both wind and solar is that these two energy sources are renewable. This means that somebody cannot get a corner on an oil well or on a

forest and pump out all the oil or cut down all the forests at once and have a big fire sale. The energy can only be acquired so fast. We can have maybe not as much energy as we want, but at least a continuing source.

An alternative that might be considered in one of its forms is biomass, but we also know that the world is wanting more and more food for its people. If you put corn into your gasoline, it's not available for eating. Anyone who has read the book *Who Will Feed China?*, written by Lester Brown of Worldwatch, will quickly realize that anything that competes in any way with the production of the world's food supply is definitely ruled out. We can't go in that direction.

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Another alternative is the hard-pressed nuclear industry, which would probably like to see us all go nuclear. The nuclear industry could certainly provide the industry, but it is intrinsically not a very safe kind of industry. We know that Ontario has avoided accidents up to this point, but we also remember Three Mile Island and Chernobyl, and we know that people are human. Of course, to jump a little bit to another field, but still analogous, the Walkerton report has recently come out and we have seen an example of human fallibility.

I see by the newspapers that some people are trying to involve Ontario in nuclear fusion. This is an alternative to nuclear fission, and some people say that this is a safer industry. However, it is up to now really an unproven technology. It's the sort of thing that Ontario could conceivably enter into an investigation of, in combination with other financial resources, because nuclear fusion is not only an untested technology, but it is also very expensive and we, the Ontario taxpayers, are expected to provide the financial resources.

The energy question has caused a great deal of confusion with the public. Certain individuals, such as the Danish economist Bjorn Lomborg and, earlier, Julian Simon, have added to the general public confusion by writing books that try to make the energy problem almost trivial. We know that this is not true and that these people's message, although it is very seductive, is really false and will lead us into a bad route. This issue has been taken up recently by the magazine *Scientific American*. Those of you who have been reading this magazine are aware of the objections that have been given by knowledgeable scientists to these individuals.

If we want to be practical, the most effective cost route would not be to attempt to increase the supply of power, but to reduce the demand. This would mean more building insulation and the conversion to fluorescent lighting—although, who wants that? But maybe we have to have it. We could also reduce the demand for motor fuel by providing more adequate public transportation, but this would be expensive, and who would want that? We would be looking for a future with more restrictions, more regulations and more expenses. These are all the consequences of unrestricted growth.

We have been very uncritical of the notion of unrestricted growth as the solution to all of our economic and political problems. Anyone who questions the doctrine of unrestricted growth is somehow labelled as an enemy of the people and is ostracized. But our Mother Earth has its limits, and is trying to tell us that if we want to survive into the future, we must be prepared to think a little more carefully and a little more deeply.

That's all of my presentation. I'm sorry if I haven't been able to speak too clearly.

The Chair: No, it's been just excellent. No problem at all. Thanks very much for the presentation. We are actually well over the 10 minutes so, again, thank you for coming forward. It was much appreciated.

The directions have been handed out for the visit. Everyone have copies of those.

I have just one short question that I was going to ask of committee members. I'm not sure if you presented or not, but certainly you two have had some very interesting visits over the last while. I wondered if maybe, when we reconvene—is it the 18th?—after we travel, we might have you present for 20 minutes or a half-hour or whatever, each one?

Mr Gilchrist: Absolutely.

The Chair: I'm just asking now so you can prepare. I think it's been asked that a written report be given, but I think it would be interesting to hear from you in a presentation. Are you comfortable with that?

Mr Gilchrist: Yes, totally.

The Chair: And you?

Mrs Bountrogianni: I'm very comfortable with that. I just finished the summary of that trip, so it's going to be available for the committee.

The Chair: OK, great. So maybe I'll have the clerk schedule in 20 minutes or a half-hour for each sometime during that week.

Mr Hastings: I have a report ready. I could have presented it yesterday in Toronto.

Mr O'Toole: Do it from memory.

The Chair: I think it would be interesting to have a discussion on it.

The other thing I've been discussing with our researcher, Mr Richmond, is looking a little further at some other policies that we didn't get in that report, looking at Denmark, Germany, Spain, Holland, and particularly how they got wind into place.

Mr O'Toole: Holland and Denmark are amazing.

The Chair: Yes.

Mr Gilchrist: Might we reflect on that? Three of us have an engagement that we're somewhat challenged to get to on time.

The Chair: By all means.

Mr Gilchrist: But we'll do that this afternoon.

The Chair: OK. The committee is now recessed until 3 o'clock.

The committee adjourned at 1217.

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