

**Commentary to NRCan Following the May 3rd and 4th
Renewables Consultation**

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Multiple Objectives

OREG is strongly suggesting that a national alternate energy strategy is an opportunity to create an action plan focusing efforts to address short-, medium-, and long-term approaches to energy supply and a lower carbon-based energy economy. To do this, it must address multiple objectives.

Sustainability

Ocean tidal, wave, salinity and thermal energy is predictable, forecastable and infinitely renewable. During the life-cycle of an ocean energy installation, conventional energy sources will only be required during manufacture and installation. Minor fuel or lubricant use is required during operation, and carbon-based energy will not be used in the production of power, hydrogen, potable water, compressed air, cooling water or other products.

A national environmental and sustainability objective must address more than near-term greenhouse gas emission reductions. Steps need to be taken in order to add new generation supplies that have characteristics such as ocean energy to Canada's future energy mix. These characteristics need to be assessed in full cycle costing and include the economic and social sustainability themes as well.

Increased Penetration of Renewables

A major thrust of current renewable energy policies is the use of incentives that encourage utilities to incorporate renewables.

The WPPI and RPPI programmes are aimed at increasing the penetration of commercial renewable energy technologies. OREG recognizes the role that this type of incentive has played in the expansion of the installation of wind energy technologies, and the potential impact that RPPI will have on micro-hydro, biomass and other renewables. OREG believes that this type of incentive aids in the early commercial penetration stage of new energy resource technologies, but insists that a national policy recognize that these will not be the same tools to be used to stimulate emerging technology development, demonstration or pre-commercial launch of emerging resource industries.

Diversifying the Energy Toolbox

Renewable penetration and renewables diversity are not the same things.

Future energy supplies will need to come from a diverse mix of resources and technologies that optimize on regional opportunities, the minimization of environmental impacts, hedging against climate change, and the security of energy supply and cost. Many of the medium- and long-term supply options will need strategies to help develop them as real production options.

Policy objectives aimed at ensuring diversity of energy supplies will require different tools and time frames than the penetration incentives discussed above.

Exploiting Resource and Other Advantages

Each nation, Canada and its regions are exposed to a differing mix of renewable energy resource opportunities. A renewable energy policy must recognise resources, market access, grid and other infrastructure, and, regional and industrial benefits that create a strategic advantage for Canada. Using ocean energy as an example, the Canadian renewable energy strategy should address for each:

Attribute	OE strength
Resource availability	Very strong (near-unique)
Resource/grid access	Strong
Power quality/reliability	Very Strong
Carbon-free	Very strong
Environmental footprint	Very strong (high power density)
Power export potential	Good
R&D infrastructure	Very good (near unique)
Industry value chain	Very good (existing marine/offshore O&G)
World market industry development opp'ty	Very good (modularity and scalability)
New industrial opp'ty - competitiveness	Good (no proven leaders worldwide)
Regulatory framework	Mixed (complex ocean jurisdictions)
Policy framework	Weak (2005 refocus on OE lags UK by 5yr)

Economic and Industrial Benefits

An alternate energy policy can be a sustainability tool addressing environmental, economic and social goals.

Widespread adoption of some renewable energy technologies will diversify energy resources, but will be supplied by international leading manufacturers, with at best some local benefits such as partial manufacturing or installation. The development, demonstration, and adoption

of others will provide new renewable energy sources and can create economic and business opportunities to supply projects, technology, supplies, and services to a world market (such as the Danish and German wind industries).

Scotland, Denmark and Norway are strategically focusing on ocean energy for energy supply, but, more importantly, as a new industrial activity to exploit their underutilized offshore oil and gas engineering, fabrication, installation and operations experience. Canada has the same infrastructure and experience and needs to take the same approach.

A Canadian alternate energy strategy should reflect that Canadian approaches to some renewable resources could have greater longer-term economic and industrial benefits than others. This may in turn impact on the actions and priority the strategy launches.

Need For a Strategy and Action Plan

While at the May 3 meeting participants concluded that Canada has adopted renewable energy strategies in the past, DG Tom Wallace also noted that a new strategy needs to reflect the complexities in jurisdiction in Canada. To address these points would suggest that a 2005 Canadian Renewable Energy Strategy must become more of an action agenda, and in doing so incorporate the jurisdiction issues into an assignment of responsibilities.

Statement or Document: only a Starting Point

It may be fair to attribute Canadian tactical initiatives like WPPI, RPPI, SDTC, TEAM, etc. to the earlier strategy. But, if so, why the patchy focus across renewable resources and technologies and why a focus on incentivising adoption of commercial technology and commercialization programmes?

A 2005 strategy needs an action plan to keep strategically important options open for Canada, set some balance in priorities, focus on fixing jurisdictional and regulatory confusion and recognize that different approaches are needed to bring important options forward. Emerging renewable energy technologies need funding, incentive, or support programs to bring them into demonstration and pre-commercial stages.

Federal-Provincial Responsibilities Aligned in Planning

If a strategy is pushed to identify action plans to meet strategic objectives, it is inevitable that roles and responsibilities have to be identified. This will be an opportunity to clarify federal/provincial/utility and industry roles and to identify for action, areas that need to be clarified.

Parallel Actions Aimed at Different Time Frames

The May 3rd and 4th workshop did not address time frames, perhaps because all of the actions being reviewed are considered “short-term”. Consideration of the strategic approaches being pursued by other countries suggests that diversity of renewable resource use will need different approaches to address the development of options that will be important in the “medium-“ and “long-term”. Failure to have a short-term action plan to address delivery of medium- and long-term solutions may eliminate them as options.

The Canadian Renewable Energy Strategy will need to encompass parallel approaches to address different time frames and the multiple objectives discussed earlier. Absent of these, the strategy will simply address increasing the penetration of commercial renewables.

Resource Specific Action Plans

Each of the emerging renewables has unique challenges, along with the generic challenges to all non-commercial technologies, and were faced by wind, small hydro, etc. at similar development stages. Resource specific action plans may be characterized as sector development plans, strategic business plans or roadmaps. They begin with a vision for the matured sector as an economic and power contributor, and work back through the steps necessary to build the R,D&D continuum, the resolution of regulatory issues, the building of the sector value chain, and the policy and incentive framework needed to pull promising technologies through to commercial trials.

A Canadian renewables strategy should include or commit to development of these resource-specific action plans for the sectors that show strategic advantage for Canada. The tools they include, even when generic, may have to be tailored to each sector, e.g. production incentives may have to be stepped differently or may apply to differing penetration levels.

Discussion of these plans may provoke concerns of the government “picking winners”. The suggestion however is not about picking winning technologies; rather, it is about stimulating technology development in an effort to bring important renewable energy resources on stream.

Ocean Energy Potential

As a maritime nation with three oceans and numerous large lakes, OREG is convinced that Canada can be a major player in ocean energy project implementation and can take that expertise into a world market.

The Resource

OREG and the federal government are working to provide a preliminary resource estimate within a year. New Brunswick and Nova Scotia are looking at tidal current resources along with New England states. Preliminary estimates for the BC coast were prepared in the feasibility plans for two (subsequently cancelled by a change of mandate) ocean power pilots by BC Hydro. These estimates, only for the best tidal current prospects and for the wave resource on west coast Vancouver Island, are indicating that the Canadian opportunity may be the best in the hemisphere.

Our existing ocean science knowledge tells us that tidal currents are major assets in all three oceans and that wave climates are rich, but potentially limited by sea-ice in some areas.

Strategic Attributes and Opportunities

The resource distribution may provide some strategic opportunity through security of supply and cost of power to coastal communities and industry. As a distributed energy source, ocean energy may reduce stress on grids or postpone some grid upgrades in coastal regions. Because of the predictability of tidal flows and timing, and the forecastability of wave strengths, direction and duration, ocean power has the potential to deliver quality power at high penetration rates. Clearly the energy density represents an opportunity for a minimal footprint, low impact, low carbon renewable power opportunity.

But it is the potential for economic benefits, which makes much of the case for ocean energy. Ocean energy systems will draw on ocean engineering, technology, fabrication and operations expertise, currently in use or underutilized in shipping, oil and gas, fishery, aquaculture and other maritime economic activities. This will be a stimulus to maintain diversity in the coastal economy. Some local benefits could also be realized in Canadian project developments, even if the technologies are from international suppliers (the case for wind power). However, these benefits can be much greater if our strategies make us a player in delivering power projects, technologies, supplies and services, at home and to a worldwide market.

While there are no commercial, “proven” ocean power technologies or companies, and while no country has emerged as the supplier to the sector, a Canadian strategy to develop,

demonstrate and adopt ocean power technologies can be used to secure entry into the emerging world markets.

Development Trajectory

OREG is working to refine this plan during this year. The target of 25 x 25 in 25 is an apparently aggressive 25,000 MW, \$25 billion in sales and 10,000 jobs by 2025. But, this is a whole generation of engineers, technologists, business developers and policy makers away. OREG anticipates five pilot trials by 2007, establishment of multi-user test and demonstration sites with special development power purchase arrangements by 2009, launch of pilot commercial projects with enhanced renewable tariffs by 2011 and ocean energy penetration through renewables RFPs supported by appropriate RPPIs through 2025.

Ocean Energy and the RPPI

This may be the most immediate question for NRCan as they consider a Canadian renewables strategy. Clearly ocean energy should be eligible for support by the programme. However, the envisaged single level RPPI is not a tool designed to ensure that ocean energy gets drawn into the short- and medium-term renewable portfolio. Nor is it expected that ocean energy will be a significant take-up on the programme in the short-term.

OREG believes that a Canadian strategy that addresses multiple objectives will treat the RPPI as a penetration incentive, needed for each resource as technologies approach commercial levels; take-up and phase-out caps and times may need to be addressed sector by sector. OREG also believes that this “accelerator” tool should be a base used across all resources, with other tailored incentives for demonstration and commercialization layered on top.

Integrating an Ocean Energy Development Strategy Into a National Renewables Strategy

There are clearly policy, regulatory, technical, and financial challenges that are common to all renewables as they pass through the developmental, demonstration and commercialization stages. A strategy that addresses all potential resources and time frames should address these with each pioneering sector. Lessons learned should apply to those that follow along the implementation curve.

Emerging Resource Opportunities: Common Issues

Clearly the issues around interconnection (engineering) and integration (policy and economic) are being solved as penetration of wind power accelerates. Canada's unique opportunity to use hydro as the storage and load-leveling device has implications for the penetration of all renewables. OREG's concern as each of these critical limiting points is addressed, is to ensure that no unintended barriers are created for those that follow.

Sector Specific Strategy

There are no commercial or near commercial ocean energy technologies; despite the pioneer involvement of Canada in electricity production from a site-specific tidal barrage since the early 1980's. The new generation of ocean energy resource harvesting technologies is about to go through the 20-year development curve followed by wind, but take less than a decade. Policies, regulations and incentives must be matched to this target.

Roadmap and economic analysis

OREG has begun working with Industry Canada and others to build, profile, and energise the value chain that will support ocean energy development in Canada. OREG believes that a national renewable strategy should include or commit to a road map, strategic business plan or sector development strategy for ocean energy, and other emerging renewable resource opportunities. This tool is more than a technology roadmap because it must identify all opportunities, critical control points and agenda levers – technical, business development, policy and enabling mechanisms. OREG anticipates an early iteration or model for the ocean energy roadmap out of its fall seminar in St John's in October 2005. OREG will also join discussion of an economic assessment of emerging renewables with NEB.

The task of keeping the roadmap alive and monitoring progress demands a strong leadership group. A national strategy to diversify the Canadian energy toolbox and create economic

opportunity will need a strong sector leadership association. The national strategy should be used to ensure partnership of OREG with all levels of government to achieve this.

R, D&D

OREG has proposed a multi-themed programme for discussion. This is based on analyses that have been undertaken by European governments and others. It is a given that the roadmapping will re-emphasise the importance of a strategically focused effort in R, D&D, and of the identified themes. A national strategy must identify this for early action.

Participation in International and Bilateral Ocean Energy Programmes

Canada has used Powertech Labs to participate in EU and IEA multinational ocean energy projects. OREG is proposing that this become an NRCan priority, through OREG as the sector “association”. To take advantage of the experience and the work done by others, OREG suggests that our strategy should include more active participation with contributions of Canadian financial resources in return for greater access. A national strategy should aim at allowing effective participation in appropriate international and bilateral programmes for all important emerging sectors.

Linkage to the Offshore Oil and Gas Industry

The strategy should exploit all potential synergies that could lead to strategic advantage. It should examine carrot and stick options to bring non-renewable and renewable ocean energy opportunities together. Governments could link royalty streams from oil and gas directly to renewables. UK governments have used enhanced renewable energy credits to attract investment into renewable projects. Because both sectors may overlap in regulatory, operational and engineering arenas, there may be strategic mechanisms to enhance convergence.

Network of Excellence and Demonstration Centres

As modern wind energy enters its third decade the Canadian Wind Energy Association is calling for a national wind energy development site. Clearly, a national renewables strategy must lead to multi-user wave and tidal energy development and demonstration sites. OREG has proposed starting work on a feasibility assessment that can lead to the development of representative sites for demonstration of tidal current and wave energy capture through pioneering the regulatory system; in advance of any specific project commercialization proposals.

OREG has launched a networking initiative designed to create an enhanced ocean engineering (and other disciplines) research focus by government research institutions, colleges and universities on all coasts. A national strategy should focus on using granting council, Canada Foundation for Innovation, and other federal and provincial programmes to create research chairs, enhance facilities, and increase industry access.

SEA and Regulatory Development

OREG and the federal Interdepartmental Group on Ocean Energy are proposing a preliminary screening to identify potential benefits and concerns associated with the development of ocean energy. This would build on reviews undertaken in recent years in the EU and US. This work should be done well in advance of ocean energy project proposals. It is anticipated that project proposals will need to address 2-3 dozen regulatory regimes and close to 20 statutes. Early Strategic Environmental Assessments or class screenings should be a part of a national renewables strategy.

Government Procurement

Coastguard, naval, meteorological and maritime security, ocean monitoring and sovereignty needs by government, and support for isolated First Nation and other communities, may create opportunities to use procurement to pull ocean renewable energy technologies forward. There are ocean energy specific examples in current actions by the US Navy and efforts in the earlier generation of OTEC projects.

A national strategy can drive a procurement strategy by placing a premium on use of renewable energy by all government operations.

Assisted Commercial Demonstration

The different stages and scales of development and demonstration will need different levels of support to bridge cost to market price, i.e. there need to be additional levers beyond any basic RPPI. While tax assistance measures seem popular, they are unlikely to benefit growing, non tax-paying companies, or public utilities. The UK has analysed these issues specifically looking at ocean energy and concluded that research network support, direct funding assistance for demonstrations, development of publicly funded demonstration infrastructure, capital assistance for pre-commercial projects, and enhanced tariffs are all needed.

A national strategy will need an array of layered tools that can be tapered off with experience and true commercial competitiveness.

Enhanced Power Purchase Incentives

Once ocean renewable energy is near commercial, an enhanced RPPI will be needed to accelerate the penetration of renewable ocean energy. Permitting, pioneer logistics, and interconnection issues may be high for early adopters. In fact the move of the wind industry into offshore has shown this to be a challenge.

A renewables strategy should commit to developing ocean renewable adoption targets and ensuring flexibility in power purchase incentives, as long as they are a necessary bridge between market and avoidance prices.

Export Market Assistance

A national renewables strategy should address the economic benefits in developing renewable resource sectors and pursuing worldwide market opportunities. These strategically important sectors should be identified for inclusion in Canada's market intelligence, trade, foreign aid, and other policies.