

**Testimony By
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Before

**The Subcommittee on Fisheries, Wildlife and Oceans
&
Subcommittee on Energy and Mineral Resources
Committee on Natural Resources
U.S. House of Representatives**

**Joint Subcommittee Hearing
On
Renewable Energy Opportunities and Issues on the Outer Continental Shelf**

**Room 1324 Longworth House Office Building
Washington, DC
April 24, 2007 -- 2:00 p.m.**

Chairman Costa, Chairwoman Bordallo and Members of the Subcommittees, thank you for your invitation to appear before you today.

I am the CEO of Finavera Renewables. We are an energy company focused solely on development, ownership and operation of renewable energy projects around the world. Although we are developing 1500 megawatts of wind energy in Canada and Ireland, my company is represented here today because we are at the cutting edge of ocean wave energy in the United States through our US subsidiary, Finavera Renewables Ocean Energy.

We have three wave energy projects under development in California, Oregon, and Washington, and we are in discussions about others. These are not just paper projects. We are literally weeks away from issuing contracts that will put US steelworkers to work constructing our prototype wave energy buoy, which we are going to install off the coast of Newport, Oregon this summer.

I am joined today by my colleague Alla Weinstein who leads Finavera's ocean energy team. Alla is a true pioneer in this field. The company that Alla co-founded, AquaEnergy Group Ltd., became part of Finavera in 2006 when, after looking closely at every other engineering concept for wave energy, we determined that the technology Alla and her team developed has by far the highest potential to deliver environmentally sound, market-competitive electricity to the American power grid.

The technology works like this: Our buoy, which we call the AquaBuOY, converts the up-and-down motion of waves into a pressurized water flow, effectively creating the equivalent of a 650-foot waterfall. The pressurized water spins a turbine that generates electricity, just like

a conventional hydropower plant, but with no dam and no reservoir. And unlike other ocean energy technologies, the AquaBuOY does not use petroleum hydraulic fluids, so it's safer for the environment. And, of course, there are no greenhouse gas emissions.

My message to you today is simple: Ocean renewable energy's time has come. This is not pie in the sky. We are already turning ideas into jobs here in the US. Now, we're about to turn blueprints into tons of carefully engineered American-made steel. And that steel, in the form of our buoys floating off the West Coast, will soon demonstrate our ability to convert the virtually limitless supply of Pacific Ocean waves into megawatts of clean electricity.

It is a huge potential resource. The amount of energy available for us to convert into clean electrical power off just the West Coast is equal to about one and one-half times all the hydropower in the US. The East Coast and Gulf offer still more potential.

But while our time may have come, we have to acknowledge that our technology and ambitions are maturing at roughly the same time that most federal, state, tribal and local governments are first becoming aware of us. In many cases, government hasn't begun to figure out how to take advantage of what we offer in terms of helping solve the climate crisis.

That is not true everywhere. The State of Oregon has embraced wave energy. Our tribal and state partners in Washington State, and local federal officials, are working hard with us to license our Makah Bay project. The Government of Canada has adopted tax policies aimed specifically at boosting private investment in wave energy. And within US government, the Federal Energy Regulatory Commission is using its hydropower licensing authorities in a helpful way.

If we had to, we could continue forward with our business under the current laws. But if you believe, as Alla and I do, that ocean energy should be an integral, important part of the United States' response to climate change, then the current system is not good enough.

I have a two-part request of you. I also have two commitments to make, one to Congress and the second to my co-panelists who are stakeholders with Finavera in the management and conservation of the ocean.

Here are my requests:

First, I would ask that Congress assure equitable tax treatment for ocean energy alongside other renewables. No special treatment, just let us compete on a level playing field with our clean energy peers, such as wind power.

Second, I would ask that Congress clarify the current regulatory system. Section 388 of the Energy Policy Act was a step in the right direction, but it left many questions unanswered and created a few new ones.

Here are my commitments:

First, I commit to Congress that Finavera will, if given a rational regulatory environment, deliver very large amounts of clean energy, free of climate changing emissions, in an

environmentally sustainable way, at competitive prices. We want the chance to help you solve the climate challenge.

Second, I commit to my fellow panelists and other ocean stakeholders that my company is devoted to preventing the ocean energy equivalent of what Altamont Pass represents in the history of wind development. We want to get it right the first time.

We are the leaders. Finavera's Makah Bay project is the first--and only--wave energy project to enter the federal licensing process. We understand and embrace our responsibility to engage collaboratively with conservationists, fishermen, scientists, regulators and others--so that we do get it right.

Detailed Description of Finavera's Wave Energy Projects

Finavera is actively pursuing development of a number of wave energy projects, including two in Oregon (one of which is intended to be a demonstration project in 2007, the other ultimately a true commercial project), a pilot 1 MW installation in Washington, and a commercial plant project in California. All projects are proposed for locations within a few miles of shore, mostly within state waters and not on the federal OCS, because, first, transmission cables are very expensive and a limiting factor in project location and, second, so as not become involved the apparent regulatory conflict between FERC and MMS over jurisdiction in the zone between three and twelve miles off shore.

In addition, the company has projects under development in Portugal, South Africa and Canada. While the regulatory and jurisdictional aspects of those projects do not relate to the subject matter of this hearing, it is worth noting that various stakeholders in the European Union have been active, and remain quite supportive, in creating incentives for development of renewable ocean energy technologies. The forms of support have included research grants administered by the European Commission, feed-in tariffs specifically designed for ocean energy in UK and Portugal, and concentrated effort of bringing together the European ocean energy community with a goal to reach commercialization as soon as possible. There is also considerable interest in using the technology to serve isolated, energy-poor coastal regions around the world.

- Oregon Projects -- Coos County and Newport

Finavera has applied for, but not yet received a preliminary permit from FERC for the proposed 100 MW Coos County Offshore Wave Energy Plant in Oregon (FERC Docket P-12752). The company is also pursuing a demonstration project off Newport, Oregon, for which Finavera is in the process of obtaining the required state and US Army Corps of Engineers permits. A FERC permit is not necessary for Newport project because it will not be connected to the power grid.

Finavera will be manufacturing prototype buoys at Oregon Iron Works over the next few months, and intends to install a single test buoy at Newport during the summer of 2007. The demonstration tests will be completed by October 2007. Finavera anticipates that test results will be positive, such that the company will be in a position to develop the projects into full utility

scale. If so, the company will need to seek project licenses from FERC, and various other federal and state approvals.

- Washington Project -- Makah Bay

Finavera has applied to FERC for a project license for its proposed Makah Bay project off the northwest tip of Washington's Olympic Peninsula. This is the first and only application to FERC for a license to construct an offshore wave energy plant. The company recently completed a comprehensive environmental assessment under NEPA that concluded that the proposed project would have no significant adverse effects. The FERC licensing process for the Makah Bay project (FERC Docket P-12751) is expected to be completed by the end of 2007. The Makah Bay project, when built, will be relatively small, four buoys generating a total of 1MW, a scale that is a reflection of the very limited onshore grid capacity at the site.

The Makah Bay project is a true pilot, both in the traditional engineering sense, but also in a different way. There simply was no applicable comprehensive regulatory system in existence at the time of project inception by AquaEnergy (now part of Finavera) in 2001. Nobody in the private sector, academia or government -- federal, state or tribal -- had ever been required to think through what issues, concerns, or questions would need to be addressed in order to properly site an ocean wave energy project.

The project team did the right thing. Rather than try to take advantage of the regulatory uncertainty to evade scrutiny of its plans, the company launched a comprehensive outreach effort to all stakeholders. With the inception of the Makah Bay project in 2001, Finavera pioneered a collaborative approach to wave energy project development by involving commercial and recreational fishermen, environmental groups, park users, government stakeholders, public utilities, and universities in the company's planning. This approach ultimately resulted in a very high level of consensus among stakeholders, and paved the way for the FERC licensing process.

We note with particular gratification that the stakeholder advisory council for the Olympic Coast National Marine Sanctuary, in its comments to FERC regarding our license application, has not expressed opposition to our project, but has quite reasonably called for a sophisticated and continuing monitoring and evaluation program, involving sustained stakeholder communications and collaboration. The Makah Tribe is working closely with Finavera on this project as a true partner. The Department of the Interior and NOAA Fisheries and Marine Sanctuary Programs, as well as various Washington State resource agencies are not opposing our efforts, and have worked well with us to identify appropriate environmental protections and monitoring protocols.

To our knowledge, no party is opposing issuance of a FERC license for the Makah Bay project, which marks a considerable achievement for any energy project, let alone a first-of-a-kind project sited in an environmentally sensitive marine environment within the boundaries of a national marine sanctuary. We see no reason that the Makah Bay project will not be licensed, built and put into operation in a manner that meets our interests as project developers while satisfying the concerns of all stakeholders.

- California Projects -- Humboldt County

Finavera is working aggressively with California utilities to launch wave energy development in that state. The company has applied for a preliminary permit from FERC for a project near Humboldt County, along the north coast (FERC Docket P-12753). Among other things, Finavera is currently negotiating a "bankable" power purchase agreement (PPA) with one utility for a significantly sized wave power project using the company's AquaBuOY technology off the coast of California. The company looks to finance the project through conventional commercial debt. Permitting and associated project development activities are on-going.

Explanation of Finavera's AquaBuOY* Technology

Finavera's offshore power plants consist of patented wave energy converters that are based on proven, survivable buoy technology. Clusters of these small, modular devices called AquaBuOYs are moored several miles offshore where the wave resource is the greatest. The power plants are scalable from hundreds of kilowatts to hundreds of megawatts.

The AquaBuOY is a floating buoy structure that converts the kinetic energy of the vertical motion of oncoming waves into electricity. The AquaBuOY is categorized as a point absorber, defined as having a small dimension in relation to the longer wave length in which it is operating. It utilizes a cylindrical buoy as the displacer and the reactor is a large water mass enclosed by a long vertical tube underneath the buoy. The system is comprised of components that have been proven in other marine industries for decades.

The AquaBuOY consists of four elements:

- Buoy
- Acceleration Tube
- Piston
- Hose Pump

The acceleration tube is a vertical, hollow cylinder rigidly mounted under the body of the buoy. The tube is open in both ends so seawater can pass unimpeded back and forth, forcing the piston to move, and in turn extend or compress the hose pumps. Positioned at the midpoint of the acceleration tube is the piston, a broad, neutrally buoyant disk. When the buoy is at rest, the piston is held at the midpoint by the balanced tension of two hose pumps that are attached to opposite sides of the piston and extend to the top and bottom of the acceleration tube, respectively. When the buoy rides the waves, the acceleration tube moves in relation to the piston, and in turn extends or compresses each hose pump in tandem.

The hose-pump is a steel reinforced rubber hose whose internal volume is reduced when the hose is stretched, thereby acting as a pump. The pressurized sea water is subsequently expelled into a high-pressure accumulator, and in turn fed to a turbine which drives a generator. Generated electricity is brought to shore via a standard submarine cable.

* The unorthodox capitalization in the name AquaBuOY honors the memory of AquaEnergy's chief technologist, Bengt-Olov Sjostrom (B-O), and company co-founder, Yury Avrutin (Y), who died together in December 2001 when their plane crashed while investigating potential wave energy sites along the Oregon Coast.

A cluster of AquaBuOYs would have a low silhouette in the water. Located several miles offshore, the power plant arrays would be visible to allow for safe navigation and no more noticeable than small fishing boats or pilot lights.

Any offshore system must survive the harsh ocean environment. AquaBuOYs are similar to navigational buoys that have been known to survive for many decades. Safely positioned offshore, AquaBuOYs are designed for 100-year storms by riding atop the extreme waves at sea, rather than experiencing catastrophic damage, as during tsunamis, from the breaking waves onshore. AquaBuOYs are moored with advanced anchoring and mooring technology.

Because the AquaBuOY power plant systems are modular, it is easy to scale projects to meet growing power demand. Additionally, the system's modularity provides a more consistent flow of power during maintenance cycles, since individual buoys can be taken off-line, while others remain in operation. The simplicity of the AquaBuOY system makes it an ideal choice for sourcing local suppliers, construction, and maintenance. Most components are readily available from domestic suppliers and the job skills required for fabrication and maintenance are present in most coastal communities.

Observations on Current US Regulatory Approach

- Direct Subsidies are Unnecessary

Finavera believes, based on our success attracting private capital, that the ocean wave energy industry does not need direct subsidies. We do, however, believe it would be in the general public interest, and supportive of our industry, for Congress to provide adequate funding to the Department of Energy, including the National Renewable Energy Laboratories, to support independent assessment of ocean energy potential and advanced R&D work.

- Taxation Should Be Equitable

Ocean energy should be treated under the Tax Code on a par with other important renewable technologies, such as wind power. We do not need favorable treatment, just a level playing field. There are numerous legislative proposals under development today that would amend the Code to promote renewable energy. We urge Congress to ensure that ocean renewable energy is given fair treatment in such legislation.

In the longer term, we would call to Congress's attention the tax policies adopted by the Government of Canada and the State of Oregon designed to promote renewable energy technology such as ours, particularly the flow-through tax credits provided under both schemes. Descriptions of those approaches are provided in an attachment to my testimony.

- Federal Agency Authorities Need Clarification Based on Clear Goals and Principles

The February 20, 2007 Report from Congressional Research Service, *Issues Affecting Tidal, Wave, and In-Stream Generation Projects*, provides an excellent overview of the current regulatory system. We would also draw to your attention the March 7, 2007 CRS report, *Wind*

Energy: Offshore Permitting, which provides a very useful complement to the earlier report, especially in its discussion of Coastal Zone Management Act and state jurisdictional matters.

As can be seen from Finavera's experience with the Makah Bay project, we have found a way to work within the current regulatory system. Moreover, there are federal agency officials at FERC, NOAA, the Interior Department, Corps of Engineers, Coast Guard, and elsewhere who are doing their very best to make the current system work in a way that supports development of ocean renewable energy in a way that meets environmental, safety, navigation, fishery access, and other legitimate public concerns.

That said, the current system is not optimal. There are too many uncertainties about the respective authorities of federal agencies. Equally important, there are many questions about the relative powers of federal, state, and tribal levels of governments.

We understand the general temptation to focus on this situation by asking the question: *Who should be in charge?*

But, in Finavera's view, that is the wrong question at this time. We believe the better question is: *What do we want to achieve?*

Congress should focus on goals and objectives before wrestling with the question of who should carry out the mission.

You will not be surprised that we believe Congress should adopt an affirmative, enthusiastic policy to promote development of ocean renewable energy. We also believe that pursuit of that goal should be governed by the following principles:

1. Ocean renewable energy technologies and projects should be held to the highest standards of environmental performance. Blue energy has to be green.
2. The relative business success of different ocean energy technologies should be decided by private markets, not government. Let us compete to find out which technologies do the best job of meeting power market needs. Investors will embrace the most promising technologies, and utilities will buy from the most reliable and affordable sources. We believe that the quality of Finavera's technology will make us brothers-in-arms with the most demanding and prescient investors. Our competitors must feel the same way about their prospects--there is no need for government to pick winners or losers.
3. The States should be encouraged to provide timely leadership in identifying coastal areas that will be suitable, from a public policy standpoint, for ocean energy. We do not want to find ourselves pursuing federal approvals for projects that are not welcomed by the adjacent States in whose waters we may be located and on whose shores we must interconnect our projects.
4. Federal agencies should collaborate to study on a programmatic level certain environmental and other issues that likely are associated with all forms of offshore renewable energy in most locations. For example, it does not make sense to study on

solely a case-by-case basis the potential impacts of ocean energy projects on marine mammal migration. Another example of a “generic” issue would be the impact of energy projects on sand and sediment deposition.

5. Rents, royalties, and other financial terms pertaining to use of the seabed should be established in a manner that promotes, and does not discourage, ocean renewable energy, especially during the decade or more that will be needed to bring the industry to relative maturity. The many comments submitted to MMS from offshore wind interests during the course of that agency’s rulemaking on Section 388 offer useful perspective on this key financial matter.

6. Projects currently under development should not be interrupted or delayed while Congress works to enact new law. And, once new rules have been established, those projects that have made meaningful progress under the existing regulatory system should not be forced to re-start the regulatory process. We need to keep moving forward to develop ocean energy sources while making the transition to a more straightforward regulatory environment.

Thank you for this opportunity to testify. I would be happy to respond to any questions, and request that my full written statement be included in the record.

Attachment to Testimony of Jason Bak

Examples of Tax and Other Incentives from Oregon and Canada

Oregon's Approach

Oregon has adopted a collection of programs designed to create incentives for private investment in renewable energy sources, including ocean wave energy.

- Business Energy Tax Credit

The Oregon Business Energy Tax Credit (BETC) is valued at **35%** of 'eligible costs' for any particular project. The manufacturing of renewable energy devices qualifies for the BETC. The maximum eligible cost is \$10 million, resulting in a \$3.5 million tax credit. The credit is a dollar for dollar credit against State of Oregon Business taxes owed. In addition, there is a 'pass-through' option that converts the tax credit to a cash payment upon project completion. A pass through partner is identified (with assistance from ODOE) and takes the credit on one's behalf in exchange for a 25.5% cash payment based on eligible costs. Details, contact persons and applications can be found at <http://www.energy.state.or.us/bus/tax/taxcdt.htm>

- Energy Loan Program

The Oregon Energy Loan Program (also known as SELP) promotes energy conservation and renewable energy resource development. The program offers low-interest loans for projects that: save energy; produce energy from renewable resources such as water, geothermal, solar, biomass, biofuels, waste materials or waste heat; use recycled materials to create products; or use alternative fuels. The costs of designing and building an Oregon wave energy equipment manufacturing plant is eligible for a loan from Oregon's Energy Loan Program. Likewise, the costs of planning, designing and building a wave energy facility in Oregon is eligible for an energy loan. It appears that both a manufacturing plant and a wave energy facility would qualify for lower-rate loans resulting from tax-exempt bonds. Projects must be in sited Oregon.

<http://www.energy.state.or.us/loan/selphme.htm>

- Enterprise Zone Exemption (ORS 285C.055)

Through a short-term tax exemption, an Oregon enterprise zone induces eligible businesses of all sizes to make additional investments that will improve employment opportunities, spur economic growth and diversify business activity. Qualifying new plant & equipment in a zone receives a total exemption for at least three and—in some cases—up to five consecutive years from the local assessment of ad valorem property taxes, which can otherwise have a deterring effect on private investors seeking to start or enlarge operations with a substantial capital outlay. Enterprise zone property (except hotel/resorts and utilities) also is exempt for up to two years while it is being constructed or installed.

<http://www.econ.state.or.us/enterthezones/whatare.htm>

Appendix 1--Examples of Tax and Other Incentives from Oregon and Canada

- Construction-in-Process (C-i-P)

For up to two years, all structures and heavy equipment are exempt from taxation. This exemption is available for each year, in which on January 1 the facility has been neither placed in service nor used or occupied for intended, commercial operations.

<http://www.econ.state.or.us/BIexemp.htm>

- Strategic Reserve Fund

The Strategic Reserve Fund (SRF) was established by the Oregon Legislative Assembly to support economic and community development in Oregon. SRF projects must be approved for funding by the Governor. With the SRF, Oregon supports cost effective projects that create, expand and preserve the principal traded-sector industries of Oregon. The fund encourages diversification and preservation of regional economies. Administered by the Oregon Economic and Community Development Department (OECDD), the SRF is used to invest in time-sensitive economic opportunities statewide. Awards from the fund must be directly approved by the Governor of Oregon and are most often in the form of a forgivable loan.

- Research Tax Credit

The credit applies to research activity or investments during the tax year. It equals 5 percent of the increase in research expenses over a base amount for the taxable year. Alternatively, the credit is 5 percent of qualified research expenses that exceed 10 percent of Oregon sales for the year (capped at \$10,000 for each percentage point in excess). The annual maximum credit allowed per taxpayer is \$2 million. This credit is based on the federal R&D credit and available only to corporate taxpayers. <http://www.oregon.gov/DOR/BUS/docs/102-694-9.pdf>

- Strategic Investment Program (SIP)

The Strategic Investment Program (SIP) was authorized by the 1993 Legislature to increase Oregon's ability to attract and retain capital-intensive industry and jobs, particularly in high-technology industry. Under the SIP, traded-sector companies making large investments in new real and personal property are subject to fewer taxes, with the aim of fostering economic growth and improving employment opportunities in the state. Projects approved for the SIP must pay full property taxes on the first \$25 million or \$100 million invested, a threshold that increases 3 percent each year; all value above this threshold is exempt from taxation. An annual Community Service Fee equal to 25 percent of abated taxes, up to \$500,000 or \$2 million, must also be paid. Additional fees can be negotiated, as part of the local approval process with the county and city government. <http://www.econ.state.or.us/BIexemp.htm>

- Workforce Training Funds

The Employer Workforce Training Fund (EWTF) provides a resource for training Oregon's private sector workforce. The emphasis of the funds is to upgrade skills of the workforce in order to increase productivity, keep Oregon businesses viable and competitive, and to offer new skills and opportunities to Oregon's workers. Particular emphasis will be placed on investments that assist labor, businesses and industries with cost effective training projects that retain and

Appendix 1--Examples of Tax and Other Incentives from Oregon and Canada

expand jobs in traded-sector clusters that are economically important to the state's regional economies and the state as a whole.

After the company has been in operation for at least 120 days, it can be eligible for workforce training assistance. Application must be made for such grants and issuance of the grants cannot be guaranteed by the State. However, the State and the local partners shall make best efforts to secure grants for training to meet the company's needs and in accordance with state laws and regulations. <http://www.econ.state.or.us/BIAworkforce.htm>

Canadian Approach

Canada, and in particular British Columbia (where Finavera's head office is located) is a favorable region in which to set up a technology venture, because of generous research and development tax credits. These incentives include federal government incentives (New "flow through of expenses" regime and SRED), and provincial incentives.

- New Federal Government "Flow-Through" and accelerated CCR incentives

In its recently-announced 2007 Budget, the federal government made ocean energy eligible for the Canadian Renewable and Conservation Expense ('Flow Through') and the Accelerated Capital Cost Allowance regime.

The new tax credits will help ocean energy companies raise money for development work. The 'flow through' tax credit—which currently available for mineral and wind resource development—encourages investment in exploration by offering tax incentives to investors.

On April 18, 2007 The Honorable Gary Lunn, P.C., M.P., Canada's Minister of Natural Resources, wrote Finavera the following letter:

Dear Mr. Bak:

Thank you for your letter of March 26, 2007, regarding tax treatment to ocean energy.

On March 19, 2007, our government displayed its commitment to the environment and renewable energy by announcing the extension of the accelerated capital cost allowance and Canadian Renewable and Conservation Expense (CRCE) to ocean energy and other renewables. As active proponents of this amendment, Finavera Renewables helped to successfully illustrate to government the utility of these market driven tax incentives to support Canada technology and domestic industry.

Through the implementation of these important tax incentives, the Government of Canada is investing in technologies that contribute to reductions in greenhouse gas emissions, improved air quality, that promote the diversification of the energy supply and a competitive economy. We will support the ocean energy sector and its Canadian developers and technology leaders such as Finavera.

Appendix 1--Examples of Tax and Other Incentives from Oregon and Canada

Again, thank you for writing on this important matter.

Yours sincerely,

The Honourable Gary Lunn, P.C., M.P.

Following are the details of the incentives promulgated in the 2007 Budget.

Accelerated Capital Cost Allowance for Clean Energy Generation

A 50-per-cent accelerated capital cost allowance (CCA) is provided under Class 43.2 of Schedule II to the Income Tax Regulations for specified energy generation equipment. Eligible equipment must generate either (1) heat for use in an industrial process or (2) electricity, by:

- using a renewable energy source (e.g. wind, solar, small hydro),
- using waste fuel (e.g. landfill gas, manure, wood waste), or
- making efficient use of fossil fuels (e.g. high efficiency cogeneration systems).

Class 43.2 was introduced in 2005 and is currently available for assets acquired on or after February 23, 2005 and before 2012. For assets acquired before February 23, 2005, accelerated CCA is provided under Class 43.1 (30 per cent). The eligibility criteria for these classes are generally the same except that cogeneration systems that use fossil fuels must meet a higher efficiency standard for Class 43.2 than that for Class 43.1. Systems that only meet the lower efficiency standard continue to be eligible for Class 43.1.

Where the majority of the tangible property in a project is eligible for Class 43.1 or Class 43.2, certain project start-up expenses (e.g. feasibility studies, engineering and design work) qualify as Canadian Renewable and Conservation Expenses (CRCE). They may be deducted in full in the year incurred, carried forward indefinitely for use in future years, or transferred to investors using flow-through shares.

The Government continues to review Class 43.2 on an ongoing basis to ensure inclusion of appropriate energy generation technologies that have the potential to contribute to energy efficiency and the use of alternative energy sources.

The Federal Budget 2007 proposes to extend eligibility to an emerging source of renewable energy—wave and tidal energy—and to a broader range of applications involving active solar heating, photovoltaics, stationary fuel cells, production of biogas from organic waste, and pulp and paper waste fuels. The Federal Budget 2007 also proposes to extend eligibility for Class 43.2 to assets acquired before 2020.

By encouraging investment in these technologies, these changes will contribute to a reduction in greenhouse gas emissions, improve air quality and promote the diversification of the energy supply.

Appendix 1--Examples of Tax and Other Incentives from Oregon and Canada

Wave and Tidal Energy Equipment

The 2007 Federal Budget proposes to extend eligibility for Class 43.1 and Class 43.2 *to include equipment that generates electricity using wave or tidal energy, provided they do not do so by means of a barrage or other dam-like structure.* Eligible equipment will include support structures, control, conditioning and battery storage equipment, subsea cables and related transmission equipment, but will not include buildings, distribution equipment or auxiliary electrical generating equipment and any other property not used primarily for the purpose of the wave- or tidal-energy system. The change will apply to eligible assets acquired on or after March 19, 2007.

- Federal Government SRED Program

The Canadian government provides over \$1.5 billion of incentives each year to companies and other taxpayers who do research and development work. This program is known as the **Scientific Research and Experimental Development Program (SRED)**. Current information on the program is available on the **Canada Customs and Revenue Agency (CCRA)** web site at <http://www.rc.gc.ca/sred/>. The CCRA is responsible for administering the SRED program, while the Department of Finance, an executive branch of the federal government, is responsible for the legislation that governs it.

What is SRED?

SRED is designed and administered as a federal tax incentive program to encourage Canadian businesses of all sizes and in all sectors to conduct scientific research and experimental development (SR&ED) in Canada. The aim is to encourage and, indirectly, finance new, improved, or technologically advanced products or processes. SRED is the largest single source of federal government support for industrial research and development. SRED claimants can apply for SRED investment tax credits for expenditures such as wages, materials, machinery, equipment, some overhead, and SRED contracts.

Who qualifies for SRED?

Generally, a Canadian-controlled private corporation (CCPC) can earn an investment tax credit (ITC) of 35% up to the first \$2 million of qualified expenditures for SR&ED carried out in Canada, and 20% on any excess amount. Other Canadian corporations, proprietorships, partnerships, and trusts can earn an ITC of 20% of qualified expenditures for SR&ED carried out in Canada. Generally, a CCPC with a taxable income in the immediately preceding year that does not exceed the business limit may receive a portion of the ITC earned as a refund, after applying these tax credits against taxes payable. The ITC earned by a Canadian corporation that is not a CCPC is non-refundable, but may be used to reduce any taxes payable. The ITC earned by a proprietorship or certain trusts may be partially refunded after applying these tax credits against taxes payable.

What kind of projects qualify for SRED?

To qualify for the SRED program, work must advance the understanding of scientific relations or technologies, address scientific or technological uncertainty, and incorporate a systematic investigation by qualified personnel. Work that qualifies for SRED tax credits includes:

- experimental development to achieve technological advancement to create new materials, devices, products, or processes, or improve existing ones;

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- applied research to advance scientific knowledge with a specific practical application in view;
- basic research to advance scientific knowledge without a specific practical application in view; and
- support work in engineering, design, operations research, mathematical analysis, computer programming, data collection, testing, or psychological research, but only if the work is commensurate with, and directly supports, the eligible experimental development, or applied or basic research.

How the SRED program financially assists companies—examples

Even if a claimant has no revenue, or has revenue but is not yet profitable, it can receive the SRED credits in cash. The federal government will send such a claimant a check.

In British Columbia, that can amount to as much as 68 cents back on every incremental SR&ED dollar spent by the claimant.

Generally, Canadian-controlled private corporations (CCPCs) with less than \$200,000 in taxable income can receive a refundable investment tax credit (ITC) of 35% (68% after the gross up - see below) of qualifying SR&ED expenditures, to a maximum of \$2 million of expenditures. Most other Canadian corporations, proprietorships, partnerships, and trusts can receive an investment tax credit of 20% of qualifying SR&ED expenditures.

So, for every \$1.00 the company spends on research and development *including an overhead allowance*, it may be eligible to receive up to \$.35 back in either *cash* or a tax credit from the federal government. From a corporate finance point of view, this is similar to having a 35% equity infusion into the business. Public companies and non-CCPCs, such as foreign controlled corporations, are limited to a 20% grant.

The federal government also allows claimants to claim overhead on their SR&ED expenditures. For companies that have a dedicated R&D facility this is easy to do, but if the R&D is part of the company's overall operation the calculation of overhead can be cumbersome. Therefore, the government permits claimants to claim an overhead "proxy" which amounts to 65% of their direct cost. *Example:* a company hires an R&D employee and pays her \$100K during the fiscal year. The company can actually claim the 35% SRED grant on its total "deemed" cost of \$165K (i.e. \$100K x 1.65).

- British Columbia (BC) and other provincial SRED incentives

Certain provinces, such as British Columbia, also provide a provincial SRED credit. In the case of BC, the Province provides an additional 10% SRED credit. So, for every incremental SR&ED dollar spent, a total of \$.68 can be recovered by way of SRED credits—taking into account the provincial and federal SRED credits on the "overhead topped-up" direct R&D cost.

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