PLEASE NOTE NEXT MEETING WILL BE FRIDAY NOV. 21 AT 9:30 IN THE MORNING IN THE SACO TREATMENT PLANT

SACO ENERGY COMMITTEE
MINUTES OF OCT. 17, 2008 MEETING

Committee members present: Howard Carter (Treatment Plant Director); Mark Mitchell (Saco Code Enforcement); Eric Cote (Saco City Councilor); David Bouffard and Tom Schwartz (both from Woodard and Curran)

1. SACO'S PROMOTION OF THE USE OF CFL'S

Mark has purchased from Lowe's 5,000 100 watt CFL's at a cost to the city of $1.05 apiece. A very good buy. Efficiency Maine contributed another 80 cents per bulb to the purchase, beyond the city's cost of $1.05. Each bulb is packaged, and will be in a small Lowe's bag. Efficiency Maine is delivering to Mark 5,000 brochures that explain the benefits of CFL's. An Efficiency Maine brochure will be placed in each bag. As a rule of thumb, replacing an incandescent light bulb with a CFL saves 40 kWh per year per bulb. A kWh in Maine currently costs nearly 16 cents, and will soon hit 16 cents. Tom suggested that the city also put a letter in the bag from the mayor explaining the reasons for the city's effort to promote the use of CFL's.

Part of the distribution of the CFL's will be on election day on Nov. 4 at each poll. One bulb will be given to each resident. Wards 1 and 2 vote at the Middle School. Wards 3 and 4 vote at the Fairfield School. Ward 5 votes at the Community Center. Wards 6 and 7 vote at Burns School. The Saco Energy Committee will coordinate the manning of a card table at each school, and is looking for volunteers to help with handing out the bags. There will be one volunteer at each school. Anyone interested in working a few hours, please call Eric Cote at 284-7059, leave a message, and you will be called back.

2. SOLAR THERMAL COLLECTORS

Howard is going to try to install a 4 foot by 8 foot solar thermal collector on the Treatment Plant office exterior wall prior to the next meeting. The price is estimated to be between $1600- $1800. The collector will heat a portion of the office. If the promising technology works, and is cost effective, the Committee will recommend more.

3. EXPLANATION OF THE PROCESS OF OBTAINING RENEWABLE ENERGY CERTIFICATES

See attached memo from Jim Rodier.

4. SOLARTUBES

Howard said the 2 solartubes in the Treatment Plant Lab. are working well. Howard will be installing 4 in the soon to be built Cascade Brook Pump Station, and plans to install a number in the proposed treatment plant processing building. The committee agreed to recommend the purchase of 5 more at about $400 a piece to put in the Treatment Plant office. Discussion took place on putting solartubes in single story school buildings with a lighting system that is in sync. with the natural lighting. The natural lighting from the solar tubes has health benefits.

5. TIDAL ENERGY

See attached notes done by Saco Energy Committee member Hilary Skillings on the Sept. 23, 2008 presentation by Ocean Renewable Power Co. at SMMC.

6. NEXT MEETING

The next meeting will be on Friday Nov. 21 at 9:30 in the morning in the Saco Treatment Plant. The agenda at this time is:

1. View solartubes;
2. View solar thermal collector;
4. General discussion.

Howard Carter

From: Jim Rodier [jrodier@freedomenergy.com]
Sent: Friday, October 17, 2008 8:32 AM
To: Howard Carter
Subject: Plan for Saco RECs

Howard, here is an overview of the process pertaining to Renewable Energy Certificates:

1. Obtain Certification as a Class I Renewable pursuant to Chapter 311, Section 3 B. 4. of the Rules of the Maine Public Utilities Commission

2. Obtain an Account on the NEPOOL Generation Information System (www.nepoolgis.com). This is the central registry in New England for auditing and verifying the amount of REC's produced. Each REC is equivalent to 1 megawatthour of electrcity produced. 1Mwh = 1000kwh.

3. Enter into a bilateral contract with a New England utility or competitive energy supplier that needs to acquire Class I certificates inorder to comply with a mandatory Renewable Portfolio Standard. For example, in 2008 one (1) per cent (%) of all electricity sold at retail in Maine must be from Class I sources. .

4. The Class I RECs are now trading at approximately $40 per REC. So if the Saco wind turbine were to produce 80 Mwh per year, the value would be about $3200.

Please let me know if I may be of further assistance. I will volunteer my services as I did with Kittery.

Jim Rodier

jrodier@freedomenergy.com

439-1310

Notes from
Tidal Energy: A Unique Opportunity and Challenge for Maine
SMCC Science Dept. Seminar Series
September 23, 2008

Presentation by:
John Ferland, Director of projects
ORPC Maine (Ocean Renewable Power Co., Maine branch)
2 Portland Fish Pier, Suite 307
Portland, ME 04101
www.oceanrenewablepower.com

Speaker background: Masters in Marine Affairs. Formerly at Maine Ctr. For Enterprise Development (renewable energy efforts). Before that, ran spill response team in Casco Bay.

Company background:

- ORPC founded in 2004 for emission-free electricity
- Locations in Maine are in Portland and Eastport
- Has developed OCGen™ proprietary technology
- Two tidal energy project sites: Eastport (Western Passage and Cobscook Bay) and Alaska (Cook Inlet)
- Hope to be generating power by 2011, 1-5 Megawatts.

Brief Overview of Tidal Energy

Tidal energy comes from reversing current. Amount of water and current flows are predictable. Maine has high tidal range and powerful current. Islands and rivers cause narrows, channel water, more powerful current. Tide in Eastport – 20ft., Portland area 9ft. Bay of Fundy, 50ft. Tidal power has parallels to wind power, but intermittency is predictable.
More power at change of tide, less during slack tide.

Two tidal energy conversion technologies:

Dams (tidal barrages)

- Advantage – proven technology; equipment readily available
- Disadvantage – negative environmental impact on ecosystem; flooding

Tidal In-stream conversion (TISEC) - Devices comprised of rotor blades and generator

- Advantage – potentially most environmentally benign
- Disadvantage – not ready yet
- Two Types of TISEC devices
  - ***Axial Flow Turbines*** – "Windmills under water," axis of turbine parallel to direction of current flow
  - ***Cross Flow Turbines*** – advanced paddle wheels; axis of the turbine perpendicular to current flow

ORPC Project
Site Specifications for Tidal Energy project:

- Substantial tidal current velocity, peaking at 6 knots or greater for both flood and ebb
- Depth and width
- Proximity to electricity grid (Bangor hydro)

1st Step - Preliminary permit from FERC (Federal Energy Regulatory Commission) for 3 years. Gives exclusive rights. Subject to process standards. 9 prelim permits and 4 pending for companies looking to develop projects in Eastport area. Penobscot Indians have one permit for project to design system to power waste treatment plant.
Next step pilot project license.
Third step – operating license

Hope to commercialize TGU (Turbine Generated Unit) by end of 2009
Evolving to full marine composite product
Have been testing units by towing to generate current and test under stress.

TGU (see drawing at http://www.oceanrenewablepower.com/pdf/SR7_Sept2008.pdf)
Self starts under load in current in speeds under 2 knots and generates current continuously. Stopped if drops under 1 knot. Rotates at 40 rpm at peak. Scaled up to 6-knot current, produces 21.6kW (?). Anchored. 40' typical min. clearance between unit and surface. Typically 4 stacked units. Vertical and horizontal configurations are being considered. Measures to account for marine bio-fouling (seaweed?). Need to determine correct spacing in water. Prefers "foil" to blade for term. Shaped like airplane wings.

See video, "OCGen TGU Demonstration Project" on
http://www.oceanrenewablepower.com/orpc_videos.htm

ORPC has been observing project by Verdant, in NY, East River. Companies learn from each other.

***A town? in Massachusetts is working with ORPC to adapt their technology to a river. Different state regulatory environment. (Sorry I missed the name, but John Ferland said okay to contact him if you want to learn more or contact the people on this project. - hs)

Scalability – technology will mature. May see around islands and small rivers.

Opportunities and Advantages for Maine
Business opportunity to develop an "Ocean Energy Cluster"
Marine industry, working waterfront, skilled marine workforce – all advantages to locating here.
Research infrastructure exists in state.
Total potential energy production could be in hundreds of megawatts.

Hoped for power generation(?)

Installed Capacity (2015 est.)	Households	Est. CO2 reduction
100 MW (1 TGU produces 250 KW)	26,000	145,000 tons

Reduce our carbon footprint.

Supply power to New England.
Bolster Maine image and economy.
Job creation in R&D, Manufacturing – composites industry
Exportable expertise

ORPC is working with Maine composite companies (Harbor Technologies in Brunswick; US Windblade in Portland; Custom Composite Technologies and contractors and UMO, MMA, GMRI, Eastport and Port Authority.

Turbines built at Maine Marine Technology Center (The "Boat School). Made of poplar, glue, and gel coat to start.

Challenges to developing tidal power

- Limited info on marine environment, therefore baselines difficult to establish. A lot of monitoring remains to be done.
- Testing to date on TISEC device impact has turned up no negative environmental impacts, however testing has been limited, so they really don't know. Areas of concern include fish and mammals, endangered species, loss of bottom space for lobsters, scallops, dragging (may be okay for those industries, however, because tidal energy requires areas with higher current). Damage to fish and mammals of concern. Testing methodology still to be designed. Project will start with 1, 5 and then 10 turbines, and test for environmental impacts at each stage. Will also do sound testing.
- Regulatory environment – changing to meet needs, but not currently equipped to address new industries? FERC set up for dams – has to change. Process is cumbersome.
- Electricity transmission infrastructure – capacity is not great enough yet

Questions from Audience

About potential damage to marine life from large turbine arrays.

How to compare with damage from other marine uses? Sense that small fish will go through. Bigger will go around. Damage to mammals and endangered species bigger issue. Temperature differential that would kill fish? No pressure differences (what kills fish around dams).

Would be affecting energy level of tide by what taken out? Affect shore?

So far don't think so, but need to consider in spacing issue. Also dead area around turbines?

Proximity to grid – if can't get to grid, potential to produce hydrogen and ship?

Regulatory changes – law in Maine, can't generate and distribute power at the same time. Vinalhaven – wind power acceptable to community if they benefit directly (as opposed to sending power generated elsewhere to sell.)

Notes taken by Hilary Skillings