

Half-Moon Cove Tidal Power Facility Eastport and Perry, Maine



Tidewalker Associates

Dr. Normand Laberge, PE

The tides of Passamaquoddy Bay and Cobscook Bay average eighteen feet and range from twelve to nearly twenty-six feet during neap and spring tide conditions. Historically power was been generated from the rise and fall of the tides in this region with small tidal mills that used the power to grind grain, polish stone and saw lumber.

Today there are several countries world-wide that harness the power of the tides with modern electrical generation techniques employing various turbine models. The Annapolis Royal Project in Nova Scotia is the closest facility to our area. In Maine, a large international tidal power project (Quoddy Tidal Power) was proposed during the 1930's and work was begun. Although that project was never completed, today's present day site at Half-Moon Cove was formed by the causeways built during Quoddy's early phase.

In the 1980's the Passamaquoddy Tribe proposed harnessing the tides at this site and under the direction of Dr. Normand Laberge, considerable groundwork was done for design and cost analysis. With the decrease in the price of oil and other changes in the political climate, the interest in alternative energy faded and the project was put on the back burner.

Today, Dr. Laberge of Tidewalker Associates has obtained a preliminary permit for the site and is filing for a license application for a modified plan to generate power with minimal impact to the environment. The Passamaquoddy Tribe and the city of Eastport have given their support to this effort. It is safe to say that with the increased interest in energy independence and carbon neutral power production, Half Moon Cove's 7MW (megawatt) tidal power facility will be a welcomed addition to the nation's energy mix.

Half-Moon Cove Tidal Power Project Perry and Eastport ,Maine

Additional Filling Gates



Powerhouse and Barrage

Half-Moon Cove basin is 900 acres and the barrage is 1200 feet across

Half-Moon Cove Project Site



Looking from Eastport across to Perry during current measurement study (mid to high-tide)

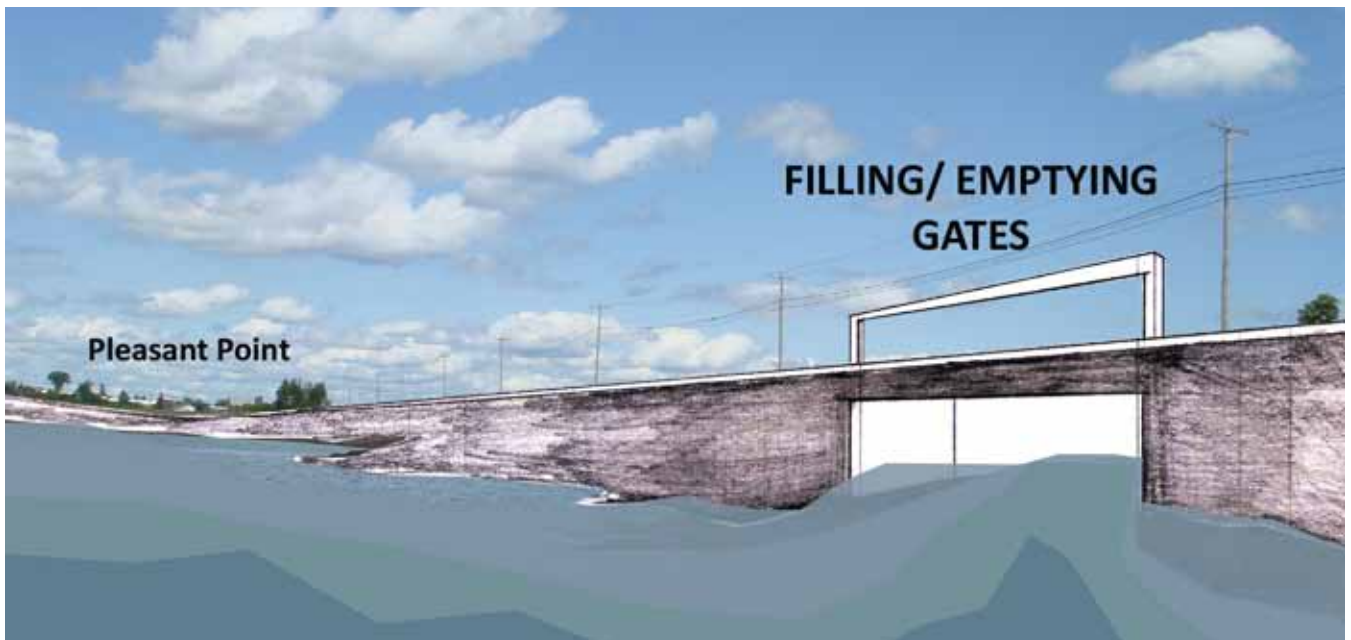
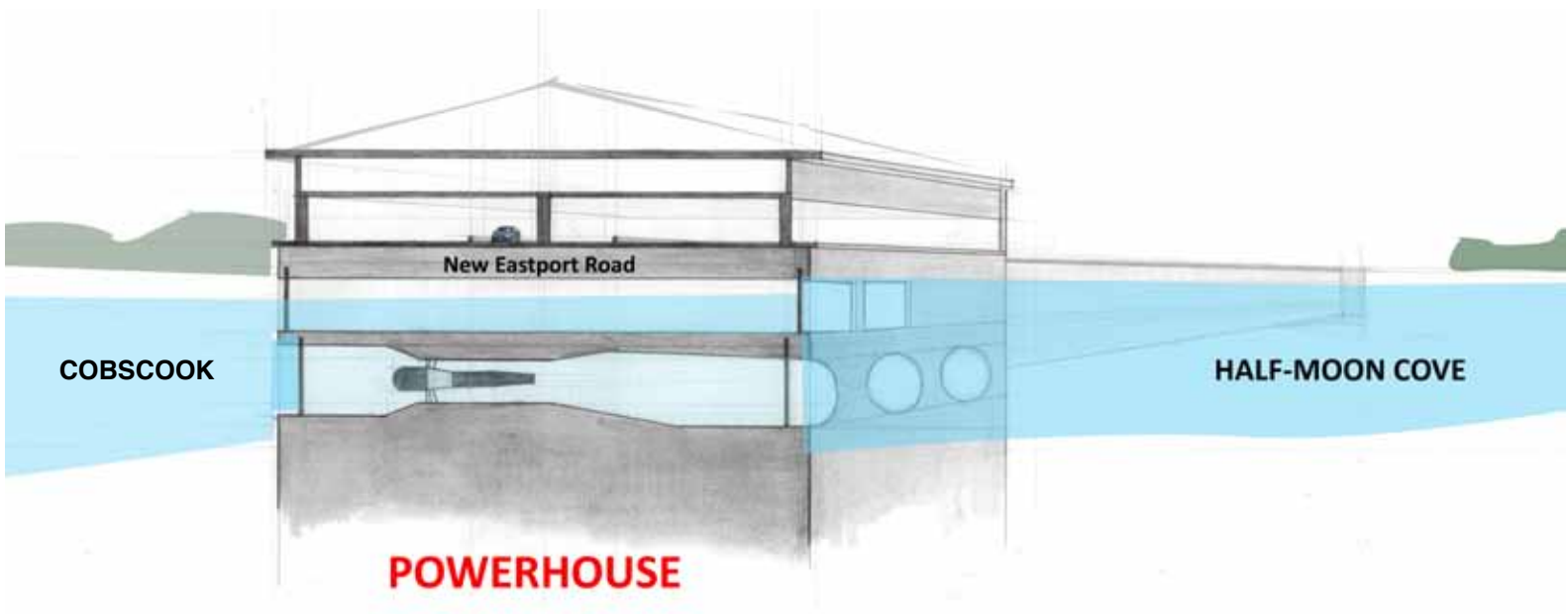


Looking from Perry side to Eastport (mid to low tide)

Tidewalker Associates has been maximizing the design of existing technologies while considering all environmental consequences. By building on existing models of similar tidal power production and comparing its potential to the latest technologies in tidal power/ hydro kinetic research and development, a new ecologically sensitive and sustainable design has been created. Tidewalker is confident that its newest design and operation mode meets the highest standards of engineering and environmental requirements and will successfully meet the region's need for electricity into the next several decades. It is with great pride that Tidewalker presents this design, offering the opportunity to generate electricity at a competitive price, well below most alternative energy schemes.

Half-Moon Cove Tidal Power Project in 2011

- employs a proven technology for zero emissions, renewable energy production that is successfully producing power in several countries world-wide.
- with production costs under 14 cents / kw-hr, out performs all other tidal power schemes (hydro-kinetic) by a factor of more than 2.5.
- with predictable tide cycles charted decades into the future, the technology can guarantee reliable production unlike wind, solar and conventional hydro.
- will maintain natural tidal range in the basin and will re-establish traditional mixing of waters impacted during construction of causeways in the 1930's thus minimizing environmental impacts and enhancing water quality
- has gained wide community support, identified for its potential as an economic engine, providing dependable energy, jobs, support for spin-off industry and partnership for improved transportation routes
- Tidewalker possesses a preliminary permit from the Federal Energy Regulatory Commission (FERC) and has filed an initial license application

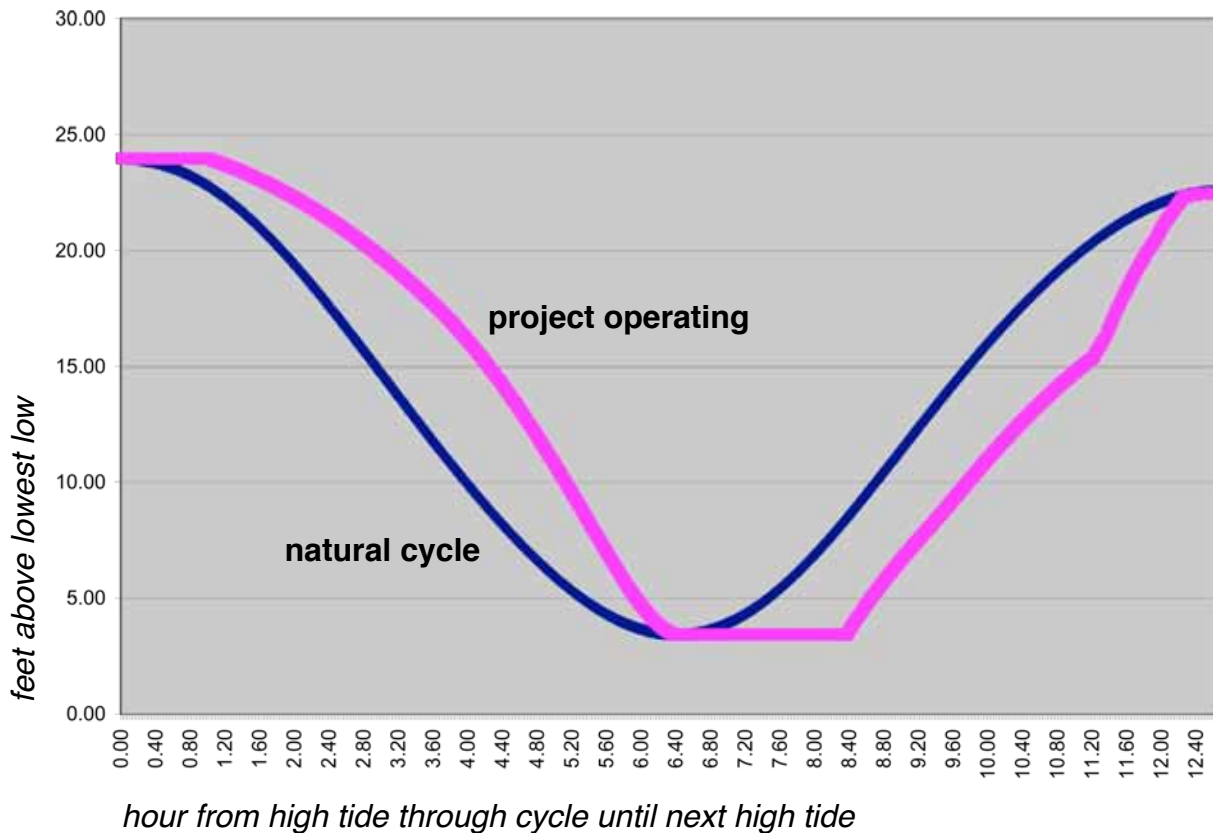


Project Specifications: Engineering & Economics

Interest Rate	7.00%
Principal	\$ 42,000,000.00
Debt Index	1.00
Equity Index	0.00
Term [Years]	20
Capacity [mw]	7
Annual Payment	\$ 3,964,502.88
Rate of Return	10.03%
Total Paid	\$ 79,290,057.62
Annual Cost Escalation	2%
Price at which Sold to Utility (\$/kWhr)	0.150
Annual Production (kWhr)	32,000,000.00

HALF MOON COVE

Water Level in basin during power production compared to natural tide cycle 20 ft tides (average)

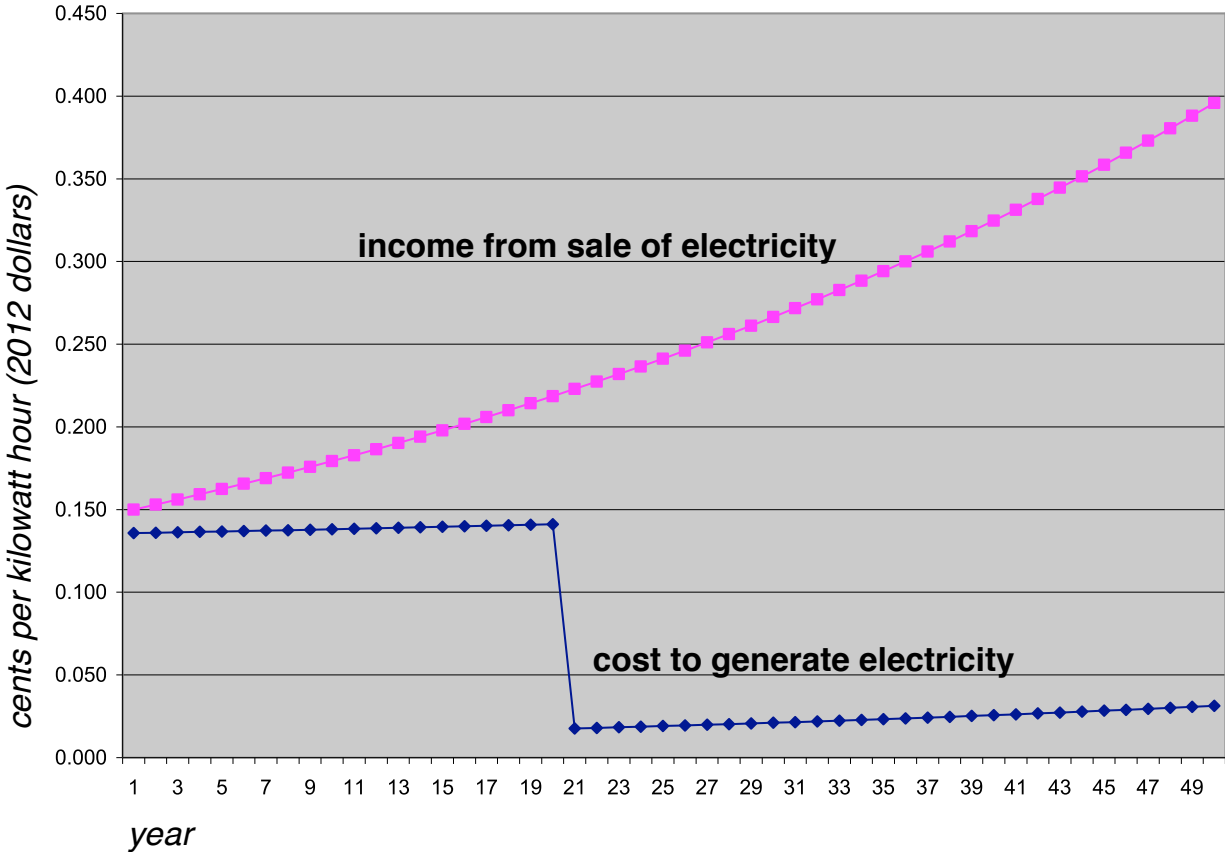


In earlier designs and modes of operation parts of the tidal range were lost during power production. After consultation with agencies and local fishermen alterations to design and operating mode were made to keep the water levels consistent with existing conditions.

HALF MOON COVE

Revenue Projection

costs vrs. income



fixed debt paid off in twenty years

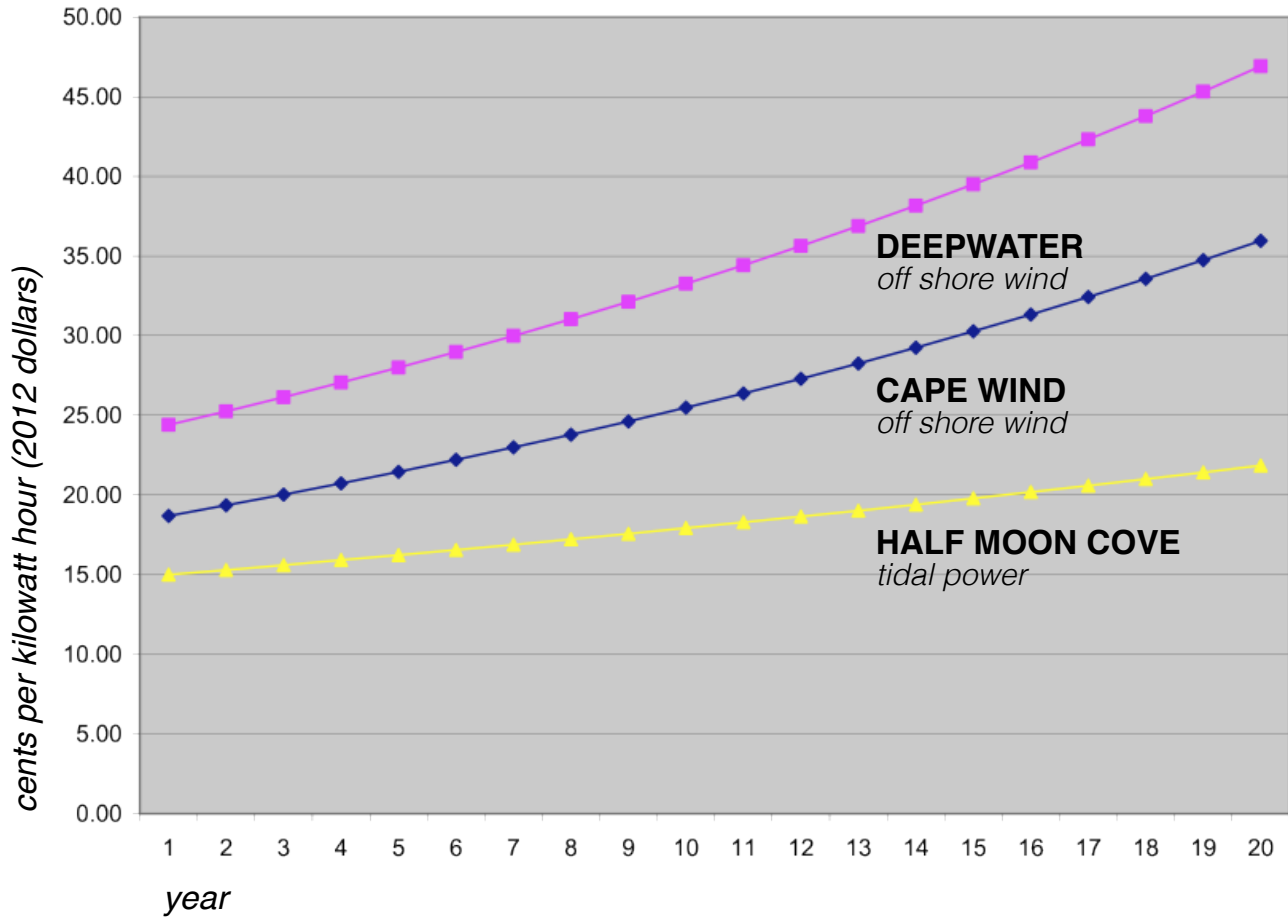
2% per year escalation of costs
 {operation and maintenance & interm replacement costs (sinking fund)}

2% per year increase in revenue

Long-Term Economic Prospects

Year	1	20	21
Initial Investment \$42,000,000			
Interest	\$ 2,940,000.00	\$ 259,360.00	LOAN PAID
Principal	\$ 1,024,502.88	\$ 3,705,142.88	LOAN PAID
Operation and Maintenance	\$ 300,000.00	\$ 437,043.35	\$ 445,784.22
Interim Replacement	\$ 180,000.00	\$ 262,226.01	\$ 267,470.53
Cost of Production	\$ 4,444,502.88	\$ 4,663,772.24	\$ 713,254.75
Cost of Producing Electricity [\$ / kw-hr]	0.139	0.146	0.022
Alternative Energy Credit [For 10 years]	\$ 240,000.00	\$ -	\$ -
Revenue From Sale of Electricity	\$ 4,800,000.00	\$ 6,992,693.63	\$ 7,132,547.50
Difference in Electricity Revenue - Annual Cost	\$ 355,497.12	\$ 2,328,921.38	\$ 6,419,292.75
Rate of Return / Direct Method	8.00%	49.94%	900.00%
Benefit-Cost Ratio	1.08	1.50	10.00

projected PPA's for **Half-Moon Cove** and existing PPA's for **off-shore wind** projects
 PPA (Power Purchase Agreements)



In 2010 the Public Utility Commissions in Massachusetts (Cape Wind) and Rhode Island (Deepwater) approved power and purchase agreements for the offshore projects at the rates charted starting in 2012. Based on the conservative projections for Half-Moon Cove, Tidewalker Associates expects to sell power starting at 15 cents a kilowatt hour with a 2% escalation rate over the first twenty years.

note: tidal power generated at this project site is predicatable in amount and in time.

Project references/milestones

Background Information:

- Half-Moon Cove Tidal Project: Feasibility Report, November 1980, Chas. T. Main, Inc., Boston, Massachusetts
- Half-Moon Cove Tidal Energy Project: Due Diligence Report, Devine Tarbell & Associates, Inc., Portland, Maine (January 2008)
- Halcyon Marine Hydroelectric, Half-Moon Cove Assessment (24.July.2008)

Letters of Support:

- Washington County Development Authority
- Passamaquoddy Tribal Council
- Eastport Port Authority
- Washington County Commissioners
- Sunrise County Economic Council
- Private Communication (Dr. Alexander Gorlov, Cianbro Corp., Free Flow Energy, Parvus Energy)

Tidewalker Technical Documents:

- Tidewalker Business Plan
- Cost-Benefit Analysis
- Economic Projection
- Development Status / Assessment

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