Northwest National Marine Renewable Energy Center

Pacific Marine Energy Center

South Energy Test Site

Business Plan

Created By

PMEC Info Here

Executive Summary

1. Written last
2. 2-pages or fewer
3. Enthusiastic, professional, complete, and concise

General Organization Background

1. What do
2. Mission Statement
3. Goals and Objectives
4. Business Philosophy
5. Customer
6. Industry
7. Strengths and Core Competencies
8. Legal Form of Ownership

Products and Services

1. Product and Services
2. Competitive Advantages and Disadvantages
3. Pricing Structure

Marketing Plan

1. Market Research
    a. Primary
    b. Secondary
2. Economics
    a. Size of Market
    b. Market Share
    c. Demand
    d. Trends
    e. Barriers
    f. Overcoming Barriers
    g. Risk Factors
3. Product
    a. Products and Services
        i. Features
        ii. Benefits
4. Customers
    a. Target Customers
5. Competition
    a. Major Competitors
    b. Competitive Analysis
6. Goals
7. Strategies and Tactics
    a. Promotion
    b. Advertising
    c. Promotional Budget

   d. Pricing
   e. Location
   f. Distribution Channels
8. Budget

Operational Plan

1. Production
   a. How and where produced
   b. Production techniques and costs
   c. Quality control
   d. Customer service
   e. Inventory control
   f. Product development
2. Location
   a. Physical requirements
   b. Access
   c. Construction
   d. Cost
3. Legal Environment
   a. Licensing and bonding requirements
   b. Permits
   c. Health, workplace, or environmental regulations
   d. Special regulations covering industry
   e. Insurance coverage
   f. Trademarks, copyrights, or patents (pending, existing, or purchased)
4. Personnel
   a. Number of employees
   b. Type of labor (skilled, unskilled, professional)
   c. Employee recruiting – how and where
   d. Quality of existing staff
   e. Pay structure
   f. Training methods and requirements
   g. Who does which tasks
   h. Scheduled and procedures
   i. Job descriptions
   j. Contract employees in addition to employees
5. Inventory
   a. What kind of inventory?
6. Suppliers
   a. Key suppliers
   b. Availability
   c. Fluctuation
7. Credit Policies
   a. Selling on credit
   b. Credit terms
8. Managing accounts payable
9. Managing accounts receivable

Management and Organization

1. Day-to-day management, bio, distinctive competencies, plan for business continuation
2. Organizational chart
3. Key employee position descriptions
    a. Include resumes of key employees
4. Professional and Advisory Support
    a. List the following
        i. Board of Directors
        ii. Management advisory board
        iii. Attorney
        iv. Insurance agent
        v. Banker
        vi. Consultant or consultants
        vii. Mentors and key advisors

Startup Expenses and Capitalization

1. Research
2. Projections
3. Sources

Financial Plan

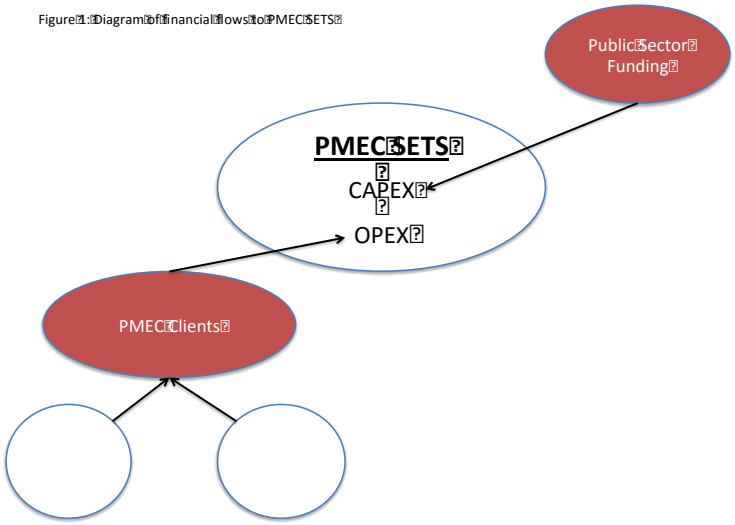
1. 12-month Profit and Loss Projection
2. Four-Year Profit Projection
3. Projected Cash Flow
4. Opening Day Balance Sheet
5. Break-Even Analysis

Summary

The purpose of this report is to determine a financial model in which revenue generation from power sales will help to offset user fees at PMEC-SETS. Costs for PMEC-SETS are split into two categories, Capital Expenditures (CAPEX) and Operational Expenditures (OPEX). It is assumed for the purposes of this report that CAPEX for PMEC-SETS (which includes all preliminary work, procurement of materials as well as construction costs) will be provided for by grants and public/private investment.

Once established, PMEC-SETS will charge user fees to companies who are testing technologies in order to offset OPEX costs. OPEX fees include all staffing, maintenance or replacement of equipment, additional fees that will be reserved to provide for decommissioning fees, as well as a contingency fund to cover emergency situations. It is also assumed that PMEC-SETS will serve as a research facility of Oregon State University, therefore the university will support any costs associated with onshore buildings such as offices and housing facilities. The financial model for PMEC-SETS is shown below in Figure 1.

Figure 1: Diagram of financial flows for PMEC-SETS



Capital Expenditures

It is assumed under this scenario that the development of the Pacific Marine Energy Center will be funded primarily by grants from the US Department of Energy (USDOE). There will also be significant public/private investment to allow for the construction of the facility in addition to federal grant moneys. CAPEX costs will cover planning, permitting of the site, procurement of materials, and construction of PMEC-SETS and are currently estimated at $XXXXX. Facility CAPEX costs will provide all essential infrastructure necessary for the developer to transmit electricity from their wave energy converter (WEC) to the local power grid.

Under this scenario, the developer is responsible for all CAPEX of their device(s) for testing. PMEC-SETS will provide a berth that is connected to the local grid infrastructure, it is then the responsibility of the developers to raise the capital necessary to build and deploy their own device.

Operational Expenditures

Operational and Maintenance estimates were created in a separate task (Task 4: Estimated Annual Facility Operations and Maintenance Cost). The Fixed OPEX costs for the facility are estimated at over $2.2 million annually. Fixed costs consist of personnel, ocean area maintenance, and terrestrial area maintenance. Office space and housing facilities, which are traditionally a fixed cost at test centers of this type, will be zero assuming the test center remains a university run facility. Variable costs are estimated at an additional $110,000 per year per berth. Variable costs consist of added environmental monitoring of deployed WEC's and additional TryAXIS buoys to record site-specific metocean data. In addition to the listed fixed and variable costs, PMEC will add on a contingency budget of 15% (of total cost) to provide for major repairs, long-term maintenance, decommissioning costs as well as emergency situations that may arise. The sale of material and reclaimed infrastructure will significantly offset decommissioning costs. With these estimates in place, it is currently assumed that annual user fees will be approximately $765,000 per berth to offset the OPEX costs of PMEC-SETS.

Under this scenario, the developer is responsible for all OPEX of their device(s) while testing. This includes all costs associated with deployment, routine O&M, device performance monitoring, emergency response (although PMEC-SETS will have a contingency for emergencies), and retrieval of the device.

User Fees

Developers testing at PMEC-SETS will pay a predetermined user fee to Oregon State University for the leasing of a berth. User fees will be based upon the anticipated annual O&M costs of the facility as well as any additional services required from the PMEC staff. See below for how user fees are calculated. Based upon the estimated O&M figures from Task 4 of this report, the user fee will be approximately $765,000/year. All revenues generated by WEC devices will be returned to the developers. This will reduce risk and uncertainty since revenues from power sales will vary based on performance of the WECs on site. PMEC-SETS will be the established partly with the local utility and will receive any payments from the utility. All berths at PMEC-SETS will have their own subsea cable, allowing for individual monitoring of energy output. This will allow for the developer to be reimbursed for the energy they have supplied.

$$\text{User Fees} = \left(\frac{\text{Fixed Costs}}{4} + \text{Variable Costs/berth} \right) \times \text{Contingency Fund}$$

Revenues

To understand potential revenues for wave energy converters testing at PMEC-SETS, financial models were created for a set of wave energy technologies at the PMEC-SETS site using the Exceedence Ltd. Software. Exceedence Finance software provides an easy 'like for like' comparison across devices, projects and locations with the bottom line being financial viability. The scenarios shown below do not include any CAPEX or OPEX costs, they only show anticipated revenues for each of the devices listed over the course of an average resource year at the PMEC-SETS site. Please note that Exceedence Ltd. Software is capable of including all costs associated with a project and projecting potential financial outcomes. More information on the software can be found at http://exceedance.net/. It is a powerful tool that should be used by companies planning to test at PMEC-SETS, however for the purposes of this report, only a simple annual projection with no associated costs was completed.

By utilizing publically available power matrices from four different technologies, wave resource data from the PMEC-SETS site, and several assumptions that are listed below, financial revenues were generated for each device on an annual basis. The data is general and is associated with technologies that are not currently scheduled to test at PMEC-SETS.

		Wavestar	OWC	Wavebob	Pelamis
	MW of device	1	0.378	1	0.75
	number of devices	1	3	1	1
	Total MW	1	1.134	1	**0.75**
FIT $/MWh	$88	$315,000	$285,006	$165,264	$156,210
	$60	$214,773	$194,322	$112,680	$106,507
	$42	$150,341	$136,026	$78,876	$74,555
	$24	$85,909	$77,729	$45,072	$42,603
	Total MWH per device	3580	**1080**	1878	1775
	Total MWH for 1MW farm (approx)	3580	**3239**	1878	1775
	FIT To attain $765,000 in revenue	$213	$708 (1 device) or $236 (3 devices)	$407	$427

The chart above shows estimated annual revenues per device. It was assumed that each device would be available 100% of the time during the year. As this is a test center, it is anticipated that the devices will likely spend some portion of time offline for various reasons, which would reduce the revenues shown above. Since it is unknown what rate the facility will receive per MWh produced, sensitivity analyses were completed for varying power rates of $88/MWh, $60/MWh, $42/MWh, and $24/MWh. An additional calculation was produced to show what rate the facility would need to attain in order for the power generated to offset the $765,000 user fees completely. The figures in the chart show that revenues (at least from the available devices) will not cover user fees without a very high and unlikely rate for the electricity generated or if there were multiple devices being tested in an array.

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Conclusions and Risks

- PMEC-SETS is an important and strategic initiative to advancing the wave energy sector in the United States. The benefits of the facility to the industry are great, however there is also significant benefit to the local economies that will service this industry. That said, there are a number of conclusions and risks that should be noted.
- PMEC-SETS must secure CAPEX cost to build the facility. User fees alone will not offset the large cost of building the infrastructure necessary for a test center of this level. Public and private support in necessary to get this project moving forward and realize its economic benefits to the community.

- Occupancy needs to be maximized. Without full occupancy there will not be enough revenue to offset OPEX costs. All efforts shall be taken to minimize OPEX costs in the early years of operation until all berths can be fully occupied.
- PMEC-SETS should make efforts to reduce O&M costs until full occupancy achieved. If PMEC-SETS begins operations without full occupancy, there is a significant risk that the user fees will fall short of covering OPEX. By limiting full time staff and subcontracting work as needed, it will help to reduce OPEX in the early years of the facility.

Appendices

1. Brochures and advertising materials
2. Industry studies
3. Blueprints and plans
4. Maps and photos of location
5. News articles
6. Detailed lists of equipment owned or to be purchased
7. Copies of leases and contracts
8. Letters of support from industry partners, stakeholders, and future customers
9. Market research studies and other materials to support assumptions in plan

Refining the Plan