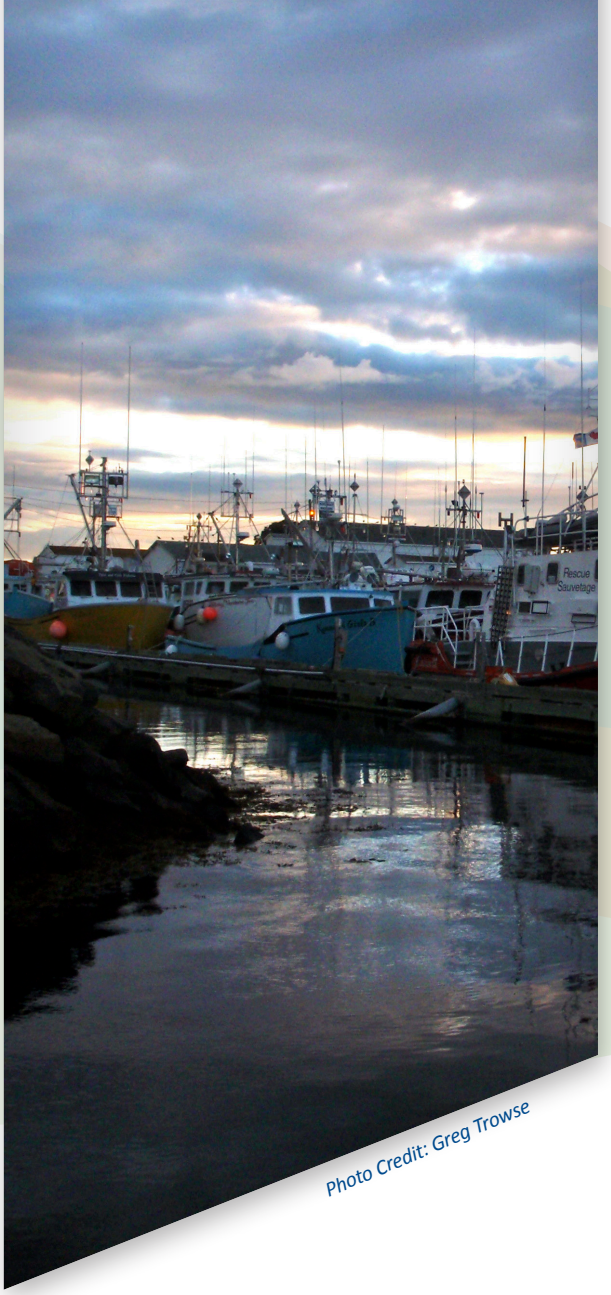

Photo Credit: Greg Trowse

8 OPPORTUNITIES AND STRATEGIES FOR COMMUNITIES

A tidal energy project can create demand for labour in multiple economic sectors and can draw on individuals and businesses from across the province.

8 - OPPORTUNITIES AND STRATEGIES FOR COMMUNITIES

WHAT DOES THIS MODULE COVER?

Tidal energy represents a unique opportunity for communities across Nova Scotia. Tidal energy development will create jobs, support research, and provide cleaner energy. Understanding the opportunities and challenges of tidal energy can support community buy-in and help communities make informed choices. This module will provide information on:

- community benefits and the types of opportunities and challenges associated with tidal energy development,
- strategies for development that harness local assets and support capacity building, and
- tidal development ownership types and their pros and cons.

The purpose of this module is to outline some of the social, economic, and other benefits that can come from the development of both small (COMFIT eligible) and large scale (FIT eligible) tidal energy development. Each community, tidal energy site, and project is unique and the challenges and potential benefits will be different in each context. The tidal energy industry is still in its infancy and there are few projects in the water. Therefore, examples and parallels from other renewable energy industries (onshore and offshore wind and other marine renewables) are used to illustrate what benefits could come from tidal energy development in Nova Scotia.

IS THIS MODULE FOR YOU?

This module is for anyone who is interested in the potential benefits of tidal energy development. It is also for anyone interested in how to strategically plan for these types of benefits and how to do so with respect to local assets and capacities.

This module includes:

- a list of tools and organizations that can assist communities in researching, planning, and understanding tidal energy projects;
- a review of ownership types and their pros and cons; and
- a community Q and A checklist to assist communities in exploring tidal energy development.

MODULE ORGANIZATION

This module is broken into two main sections. Section 1 of this module discusses, in general terms, the potential benefits to communities and local businesses from small and commercial scale tidal energy development.
Section 2 discusses community development strategies for harnessing benefits associated with tidal energy development. This discussion highlights the shift toward community/stakeholder engagement and harnessing the collective assets of the stakeholders to engage and support development projects.

8.0 - SECTION 1: SOCIAL AND ECONOMIC IMPACTS FROM SUSTAINABLE TIDAL ENERGY DEVELOPMENT

Author: Alan Howell

A tidal energy project requires a wide range of inputs. While each project may be different in size, technology, and site characteristics, each will likely include much of the following stages, infrastructure, vessels, and labour (For a more detailed account of development stages, infrastructure, vessels, and labour needs, see *Module 9: Opportunities and Strategies for Businesses*).

Table 8-1: Development Stages, Infrastructure, and Labour Needs for a Tidal Energy Project

STAGES OF DEVELOPMENT	INFRASTRUCTURE AND VESSELS	LABOUR NEEDS
The primary stages of a tidal energy convertor project include: • Research and development • Site screening and project feasibility • Planning • Project design and development • Project fabrication • Construction, installation, and commissioning • Operations and maintenance • Decommissioning	Infrastructure and vessels can include: • Wet and dry ports with lay down areas • Assembly and maintenance yards • Cranes and heavy lifting equipment • Barges and specialized vessels, such as dynamic posi - tioning vessels • Underwater Remote Operated Vehicles (ROV's)	Labour needs will include many of the following: • Project managers • Engineers (naval, electrical, mechanical) • Biologists, environmental impact assessment professionals, and various other specialists in marine and life sciences • Vessel operators • Marine construction workers • Safety personnel • Core trades – welders, electricians, metal fabricators, tool and die, etc. • Stakeholder engagement facilitators • Financing and business development experts

A tidal energy project can create demand for labour in multiple economic sectors and can draw on individuals and businesses from across the province. The intent of current provincial legislation and policy, in particular the COMFIT program, is to support tidal and other renewable energy developments from which benefits remain in communities across Nova Scotia. See *Module 4: The Regulatory Regime for Tidal Energy* for more information on current tidal energy legislation and policy.

Tidal energy is still a developing technology. There remain many unknowns about the environmental and economic impacts, therefore, tidal energy should be pursued in a thoughtful and incremental manner. This toolkit and this module are a step along the path to a better understanding of the positive and negative impacts of tidal energy development from a community perspective.

8.1 - COMMUNITY BENEFITS

In this toolkit, community benefits are defined as any changes in the status quo that result in the positive enhancement or capacity for enhancement of the economic, social, or environmental state of a community, area, or region.

Often in economic analyses, the impact or effect of a project is measured in terms of how many jobs are created directly (e.g. direct spending on a project) and indirectly (e.g. a need for added labour due to demand for services and products to support a project).

Benefits are different from economic impacts or effects in a few fundamental ways; however, direct impacts can be considered a benefit.

- Benefits are typically understood as being direct, i.e. the benefit is received by an identifiable person, community, or organization. The one exception would be environmental benefits, such as reductions in GHG emissions, which will support healthier biota, air, water, and soil locally, regionally, and internationally. Environmental benefits in a marine context tend to be more dispersed than social or economic benefits, and as such, are not discussed in depth in this module.

- Benefits are usually negotiated with a project developer or form a part of a development agreement (a legally binding agreement between a developer and an administrative authority). Businesses that support tidal energy (e.g. fabricators, maintenance facilities) may be willing to discuss community benefits.

- Benefits can be in the form of cash, assets (such as buildings, art work, or land), or experiences (education, research, or knowledge and skill building activities).

- Benefits are largely defined by the legislation and development culture of an area. For example, in the United Kingdom, the provision of community benefits (payments, assets, and/or experiences) is well developed and has a place in development legislation. In Nova Scotia, community benefits are allowed to be part of development agreements; however, it is uncommon and often only in situations where a developer is asking for exceptions to regulations and standards.

Table 8-2 outlines a selection of community benefits that have been identified as outcomes of renewable energy projects. The identified benefits focus on the social and economic benefits associated with projects.

FOUNDATIONAL CONCEPT: WHAT IS A COMMUNITY?

Communities are typically defined in two main ways: a) a geographical community defined by jurisdictional boundaries, such as a municipality, or b) a community of interest, such as fishers, trail users, or conservation advocates (Walker & Devine-Wright, 2008).

In the case of tidal energy development, there are many intersecting interests and stakeholders (for more detail on stakeholders, see Module 6 on Community Engagement). In general, anyone who lives in a geographical community should be considered a stakeholder. Communities of interest, on the other hand, may not be local and it may be difficult to identify members. Examples of communities of interest are:

- Commercial, subsistence, and sport fishers
- First Nations members and communities
- Tourism and boating
- Marine transport
- Environment and conservation advocates
- Business and business development.

Table 8-2: Categories of Community Benefits

CATEGORIES OF COMMUNITY BENEFITS[1]
1) Conventional economic benefits • The use of local labour, goods, and services • Land rents and royalties • Local business taxes
2) Flows of financial benefits • Profit share (for employees of the energy company) or equity investment (for investors in an energy company) • Community fund contributions – annual or lump sum • Sponsorship of local events • Direct income from sale of power (i.e. a price paid per kWh)
3) Contributions in kind • Landscape or ecological enhancements • Facility upgrades or construction • Infrastructure upgrading or construction • Sharing data on natural and human environments
4) Provision of local services • Educational visits or educational programs • Tourism services
5) Capacity building • Increased experience in development for local administration and elected officials • Knowledge gathered from public consultation/collaboration process

8.1.1 - WHAT WE KNOW ABOUT COMMUNITY BASED ENERGY

Communities need to weigh the pros and cons of tidal energy development to be sure investing in tidal energy is the best course of action for them. There is limited understanding of the short- and long-term impacts associated with tidal energy projects. While a great deal of research is being conducted on the impact of TECs on ecosystems, mammals, and the tides themselves, few economic and social impact studies exist. However, there are insights that can be drawn from other renewable sources such as onshore and offshore wind.

- For areas with limited industrial activity or those that have seen a downturn in traditional industries, such as fishing, forestry, or mining, renewable energy provides an opportunity to capitalize on skills and resources present (marine navigation and safety, marine equipment repair and fabrication, and use of vessels and port facilities in the case of tidal energy) (Joseph & Gunton, 2008; Boettcher, Nielsen & Petrick, 2008).

- Community-based energy can provide a reliable source of revenue based on level of production (especially in the case of tidal energy). The initial capital outlay may be high, but over time, with a secure price for energy, costs can be recovered (TREC, 2012; Joseph & Gunton, 2008).

[1]Adapted from (Munday, Bristow and Cowell, 2011).

There is limited understanding of the short and long-term impacts associated with tidal energy projects.

- Energy projects that are supported by the community tend to be the most successful in delivering benefits (Munday, Bristow and Cowell, 2011; Brun & Jolley, 2011; Walker & Devine-Wright, 2008).
- Community-based renewable energy projects can raise awareness about other energy related issues, in particular efficiency and conservation. Renewable energy projects can create momentum for additional energy programs and support a culture of conservation and energy efficiency.

FOUNDATIONAL CONCEPT: DIRECT, INDIRECT, AND INDUCED ECONOMIC IMPACTS

Direct economic impacts of renewable energy initiatives come from on-site or immediate effects created by an investment or change in final demand for affected sectors. For example, the direct effects of a tidal project can be increases in the:

- sales of tidal turbines,
- income of local turbine manufacturers, and
- jobs of workers who assemble the tidal turbines at the manufacturing plant.

Indirect economic impacts result from changing demands for those sectors that help produce the technologies. For example, an increase in production of turbines can expand:

- sales of steel to supply the turbine manufacturers,
- income of supplier companies, and
- jobs of workers in companies that supply materials to the turbine assemblers.

Induced economic impacts occur when the income generated from the direct and indirect effects is re-spent in the local economy.

For example, induced benefits could include increases in:

- sales of groceries in the towns where turbine assembly workers live,
- income of local businesses in the towns where turbine assembly workers live and spend their money, and
- jobs for workers at the local grocery store because employees of turbine assemblers used their increased wages to buy groceries.

Source: United States Environmental Protection Agency, Quantifying Economic Benefits, para. 1, http://epa.gov/statelocalclimate/state/activities/quantifying-econ.html

8.2 - WHAT ARE THE POSSIBLE BENEFITS TO THE COMMUNITY?

The following section provides examples of benefits and when they could occur in the project development cycle. The benefits highlighted in this section are drawn from examples in Nova Scotia and other jurisdic-

tions. Benefits described here represent potential rather than guaranteed outcomes. A TEC project will have unique impacts and yield different benefits, depending on whether the project is a small community-based or a large industrial-scale project. (For a more in-depth investigation of economic impact by sector, see *Module 11: Assessing the Potential Economic Impacts of a Five Megawatt Tidal Energy Development in the Digby Area of the Bay of Fundy)*. The benefits that accrue through a particular project or to a particular community are largely determined by a variety of internal and external factors.

Internal factors include:

- Local availability of skills and workers;
- Demography;
- Geography;
- Resource intensity;
- Land availability, in particular, industrial land;
- Local commercial and industrial land taxation rates;
- Economic mix, in particular, the level and type of activity related to coastal and marine industries;
- Availability of manufacturing facilities;
- Port infrastructure and availability of marine vessels;
- Political and administrative capacity;
- User conflicts such as subsistence and commercial fishing, shipping, or ferry services.

External factors include:

- Political stability and legislation around marine renewable energy;
- The established market price for renewable energy;
- Stability of energy project developers;
- Any new policy or legislation dealing with the pricing of negative externalities from energy production (e.g. a carbon tax).

8.2.1 - DISCUSSION OF SOCIAL BENEFITS

Knowledge of the social benefits of tidal energy is relatively limited at this point, compared to the economic and environmental benefits. This is due in large part to the small number of projects at this time. Social benefits largely stem from the possible increase in energy security and the long term stability of the price of energy. There is also the effect of reduced emissions and particulates from fossil fuel based energy, which has downstream benefits for health and wellbeing.

VIGNETTE: FEED IN TARIFF IN ONTARIO

Community-based energy production is growing in Canada. Currently, Prince Edward Island, Ontario, and Nova Scotia have Feed-in-Tariff programs for renewable energy. Ontario established a feed-in tariff program in 2009 to support the development of large and community-based renewable energy and to offset the use of coal fired power plants in the province. Similar to the COMFIT program in Nova Scotia, the FIT program in Ontario offered premium prices for specific types of renewable energy, with solar receiving the highest price for production. After two years, the FIT program in Ontario saw positive results.

- The government approved more than 2,500 small and large FIT projects that will produce enough electricity to power 1.2 million homes.
- The program attracted more than $27 billion in private sector investment.
- The program attracted more than 30 clean energy companies.
- The program created more than 20,000 jobs.

Source: Feed-In Tariff Program Two-Year Review – Government of Ontario http://www.energy.gov.on.ca/en/fit-and-microfit-program/2-year-fit-review/

Table 8-3: Potential Social Benefits of TEC Project Activities

POTENTIAL SOCIAL BENEFITS OF TEC PROJECT ACTIVITIES		
	OPPORTUNITIES	**CHALLENGES**
Involvement of local officials and citizens in the planning process	The development of a renewable energy project provides the opportunity for local officials and citizens to gain valuable experience in project planning and stakeholder engagement. Being involved in a project can lead to the development of skills like facilitating community meetings or negotiating contracts. It also provides an opportunity to collect information about citizen attitudes on other issues in the community.	Time restrictions due to work, seasonal labour, and having multiple responsibilities may limit involvement.

POTENTIAL SOCIAL BENEFITS OF TEC PROJECT ACTIVITIES		
	OPPORTUNITIES	**CHALLENGES**
Local facility or amenity improvements	Many smaller communities have limited capital to develop new amenities or improve existing ones such as recreation facilities. These types of amenities can serve as gathering places and add to the quality of life in a community. The cost of these amenities can be negotiated with the developer or through revenue from the community-owned project.	The first tidal energy developments will be expensive and project developers may not have funds to improve local facilities. Policy changes may reduce the tariff price for tidal energy.
Development of trails and access roads for the development	Depending on the project, access roads and similar infrastructure may need to be built. This can present an opportunity to increase access to natural areas or expand an existing trail network. However, if this is a goal, it should be articulated and incorporated into the project planning process at the outset.	Access roads may not be required for many projects, may be unsuitable for recreational use, or may not be in areas slated for residential, commercial, institutional, recreational, or industrial development.
Employment opportunities for new entrants or displaced workers	Projects will support a variety of jobs – the amount, type, length, and location of those jobs is defined by the project specifics. Increased employment opportunities can stem outmigration and support a more stable community.	Employment opportunities are largely contingent on the project and the local labour market.
Increased community capacity and broader discussion of socio-economic issues	Developing community capacity refers to the ability for communities to organize and move towards attaining desired goals such as increasing economic diversity or conservation of habitat. Training and workshops can provide skills and increase the human resource capacity of communities as a whole (Pembina Institute and Ecology Action Centre, 2011). Any stakeholder engagement activity has the potential to spur further discussion and strengthen connections within a community. However, some issues can be divisive, so a careful and well planned community engagement strategy with well-trained facilitators is essential.	Time restrictions due to work, seasonal labour, and having multiple responsibilities (work/home/volunteering) may limit citizen involvement.

8.2.2 - DISCUSSION OF ECONOMIC BENEFITS

Table 8-4 describes a variety of potential economic benefits from the development of tidal energy. As an industry still in development, tidal energy is not currently ready to support a robust supply chain. The ability of a community to garner economic benefits will depend on whether it has the necessary infrastructure, workforce, contractors, and experience for managing a tidal energy development project or power plant (Dalton & Ó Gallachóir, 2010). Many rural areas may not have the mix or scale of economic activity to provide 100% local content for a project. Generic services such as surveying or tradespeople (e.g. electricians), could meet some short and long term demand locally, such as project monitoring and minor maintenance. The benefit of not having all needed skills in one place means adjoining communities could fill in gaps. Consequently, tidal energy project spending becomes regional, rather than just local, thus spreading the economic benefits widely.

Table 8-4: Potential Economic Benefits of TEC Development

POTENTIAL ECONOMIC BENEFITS OF TEC DEVELOPMENT		
	OPPORTUNITIES	**CHALLENGES**
Direct employment; use of local content and contractors	The hiring of local residents or purchasing of locally produced goods for a tidal energy project is a significant opportunity. The inputs for a project will require highly technical to low-skilled labour. This provides opportunity for a broad range of employment opportunities.	The amount of labour and inputs sourced locally will depend upon the industrial and labour market characteristics of the area and the project itself. In some cases, a project will only require a limited amount of local goods or services. There are currently no local content rules for tidal energy development in Nova Scotia.
Land rental or lease fees	The rental or lease of land or office space may be required during the project planning, construction, operations, and decommissioning phases of a TEC project.	Rentals and/or leases may be contingent on the context and type of project.
Indirect employment opportunities	An influx of workers into a community will create demand for services indirectly related to the project such as lodgings, food, and other services.	This impact will likely only be significant during the construction and decommissioning phases of a project as this is when the most labour is required on site.

POTENTIAL ECONOMIC BENEFITS OF TEC DEVELOPMENT		
	OPPORTUNITIES	**CHALLENGES**
Potential for offseason employment for seasonal workers, including skills to assist in transitioning from traditional to newer marine industries	TEC site evaluations, data collection, deployment, safety, and monitoring activities can support additional employment for fishers, hunters, and other seasonal workers or income through the rental of vessels or other marine and coastal equipment and sites. Additionally, involvement in these activities can support the development of a broader skills base in rural and coastal communities; for example, data collection and monitoring.	The size and scale of a project will define the needs for additional staff. Smaller scale projects will likely have fewer requirements for activities like monitoring. Those hired to assist with project activities may only be required to be on hand in case of emergency and, consequently, will have limited opportunity to develop new skills.
Development of education and training programs	As the tidal energy industry grows, it will require a variety of skills and competencies at all levels. This can support the expansion of current programs or the creation of new ones in universities and community colleges to support the demand of the industry.	It is difficult to ensure that training is available ahead of labour demand, at a level that meets the industry's skills needs, and that supplies enough graduates. Industry and developers will need to work closely with training institutions.
Additional revenue or payment to the community	Community-owned projects can provide-- given limited downtime of TEC devices-- a consistent stream of revenue from the sale of energy.	High project costs, debt payments, and unforeseen technology failures or damages may a) increase the time before a project generates profit or b) limit the amount of energy sold.
Tourism opportunities	The tidal barrage interpretive centre in Annapolis Royal, Nova Scotia is a tourist attraction. Wind energy projects elsewhere have also been shown to draw tourists to an area.	TEC projects are, for the most part, entirely underwater and out of view. Consequently, they provide little in the way of an attraction. The building of an interpretation centre around TEC projects may not be affordable for some projects.
Long term stability of energy prices	Investment in renewable energies is costly. However, because the fuel for renewable energy such as tidal is free, it may be less costly than relying on fossil fuels over the long term.	Stability is contingent on continued political will to provide renewable energy projects access to markets.

POTENTIAL ECONOMIC BENEFITS OF TEC DEVELOPMENT		
	OPPORTUNITIES	**CHALLENGES**
Research and Development opportunities	The processes and technology needed for all stages of TEC projects still require extensive research. There is a need for research facilities and marine areas to test out new processes and technologies. This presents an opportunity for communities to capture some of the research and development funds associated with the industry either directly through employment opportunities or through providing services to researchers such as office space, accommodations, and food.	Companies and university researchers may opt to not take research out into communities and instead, do all, or most, of the work in-house. The most expensive research occurs around device testing and the Fundy Ocean Research Centre for Energy is expected to be the only large-scale testing site for TEC devices in Nova Scotia. A site for small scale testing is yet to be established; however, the area of Brier Island has been proposed. This limits the opportunity for TEC technology testing; however, other types of research opportunities may be available.

8.2.3 - DISCUSSION OF ENVIRONMENTAL BENEFITS

The environmental benefits of tidal energy development are not often discussed at the project level because the focus in the environmental literature has been on mitigating negative impacts. Projects are often presented in terms of how they will mitigate negative outcomes, if any, rather than in terms of their environmental benefits. The near and far field effects of TEC on the marine and coastal environment are largely unknown; therefore, benefits must be weighed against any negative impacts on the natural environment caused by TEC development.

There are some well accepted environmental benefits of renewable energy. The reduction of emissions from fossil fuel combustion supports cleaner air, water, and soil. Renewables also support reduced use of fresh water used in electricity production. [1]

[1] Water is used in conventional and renewable energy production systems. Per kWh, 0.2 – 0.6 gallons of water are used depending on the technology employed. Between 3.5 – 61 gallons are used to create one litre of ethanol (Synder & Kaiser, 2009). Oil sands extraction uses between 2 to 4 barrels of fresh water for one barrel of bitumen (Pembina Institute, Oils Sands Watch, Water Impacts, para. 2).

Table 8-5: Potential Environmental Benefits of TEC Development

POTENTIAL ENVIRONMENTAL BENEFITS OF TEC DEVELOPMENT		
	OPPORTUNITIES	**CHALLENGES**
Detailed information on local biotic and abiotic marine and coastal systems	All projects will require some documentation of the physical and ecological systems in the project area. The larger the project and the expected impact, the more detailed the information. This information, if made available to the public, can provide invaluable information for communities to support conservation, education, tourism, and research opportunities.	The level of information collected is contingent on the project and the ability of the team collecting it. Access to summary information versus raw data may vary.
Hiding and resting space for marine life	Establishing fishing exclusion zones around converters may help increase the amount of shelter for marine life. Such zones could possibly increase habitat for certain benthic species.	Creating exclusion zones may be more applicable to offshore wind, but tidal arrays may offer this opportunity.
Increased stewardship of coastal and marine areas	The attention drawn to coastal and marine areas by tidal energy may encourage greater appreciation and interest in these environments and associated biota.	Attention may create backlash to development.
Potential for coastal defence	Taking some energy or slowing the velocity of water as it reaches shore may provide erosion protection to some coastal areas.	This is speculative and is very contingent on the site and project.

8.2.4 - RESOURCES FOR UNDERSTANDING AND ESTIMATING ECONOMIC AND SOCIAL IMPACTS OF TIDAL ENERGY DEVELOPMENT

The following is a selection of tools and information to better understand the economic and social impacts of tidal energy.

Nova Scotia Department of Energy - ***COMFIT Tool Kit***
The COMFIT Tool Kit consists of materials designed for eligible entities to educate individuals, groups, and communities about the Nova Scotia Community Feed-In Tariff (COMFIT) Program. It also contains a high level discussion of what community benefits could come from renewable energy development.
http://nsrenewables.ca/comfit-tool-kit

Department of Natural Resources – ***RETScreen International***
RETScreen is Excel-based clean energy project analysis software tools, that helps decision makers quickly and inexpensively determine the technical and financial viability of potential renewable energy, energy efficiency, and cogeneration projects. The Department of Natural Resources also provides a suite of training materials to help new users learn how to use RETScreen effectively and has recently developed a policy development toolkit to compliment the RETScreen application.
http://www.retscreen.net/ang/home.php

TREC Renewable Energy Co-operative – ***Community Power Toolkit***
TREC is creating a series of free tools that address various aspects of project development. Each tool contains key information about topics like Member Management in a Renewable Energy Co-op and Community-Corporate Partnerships. The toolkit is based on Ontario legislation, but much of the key information is transferable to Nova Scotia.
http://www.trec.on.ca/services-resources/toolkit

United States Environmental Protection Agency – ***Quantifying Economic Benefits***
This page provides links to a variety of free and fee-for-service models that estimate the cost, return on investment, job creation potential, and overall economic impact of renewable energy projects and investments.
http://epa.gov/statelocalclimate/state/activities/quantifying-econ.html#a04

Fundy Energy Research Network - ***Scoping Study on Socio-Economic Impacts of Tidal Energy Development in Nova Scotia: A Research Synthesis & Priorities for Future Action***
The scoping study highlights many of the socio-economic issues related to tidal energy development and discusses best practices, case studies, and tools that have been developed to facilitate positive socio-economic benefits and community development. The report provides an overview of research and best practices developed in Canada and abroad in relation to tidal energy developments and other renewable energy technologies.
http://fern.acadiau.ca/custom/fern/document_archive/repository/documents/139.pdf

Chris Joseph & Dr. Thomas Gunton. Overview of the Socio-economic Impacts of Renewable Ocean Energy Development on the BC Coast. (2008) Prepared for the Department of Fisheries and Oceans.
Details available at: http://waves-vagues.dfo-mpo.gc.ca/waves-vagues/search-recherche/display-afficher/332868

The Department of Fisheries and Oceans has commissioned this report to:

- review the socio-economic impacts of renewable ocean energy development and the mitigation measures that can be used to address these impacts;
- identify key knowledge gaps;
- describe the scale of ROE resources of the BC coast;
- describe the extent of planned ROE development on the BC coast;
- scope potential socio-economic impacts of ROE development on the coastal communities and First Nations of the BC coast;
- identify ROE industry best practices; and
- describe the institutional structure and approvals process for ROE on the BC coast.

8.3 - SECTION 2: STRATEGIES FOR COMMUNITIES AND BUSINESSES TO GARNER SOCIO-ECONOMIC BENEFITS

Author: Dr. John Colton

Nova Scotia and other Atlantic provinces have a pool of knowledge, infrastructure, and services related to ocean and marine technology and industry. Collectively, this combination of knowledge, infrastructure, and services have been used to develop a state-of-the-art commercial fishery, ship building enterprises, oil and gas development, and barge hauling services. Local, regional, provincial, and federal governments have invested significant resources into exploring how the skills associated with these types of industries can be used in other industrial sectors. This is important, as communities are looking for strategies to become more resilient to weather the changes brought about by economic uncertainty and the booms and busts associated with certain industries.

Exploring a community's infrastructure, skills and knowledge of its citizens, and its services and amenities and understanding how these can collectively contribute to and support tidal energy development may provide for greater community resiliency.

This section provides strategies and information for communities, along with their local governments, to take up the potential opportunities provided by tidal energy. It also profiles various ownership models, each of which provides different benefits to the community.

8.3.1 - COMMUNITY STRATEGIES

Strategies for community development have evolved from a traditional top-down approach to a grass-roots approach. Inherent in this shift has been the role of the citizen and the focus of development. Rather than development driven primarily by economic considerations, development is focussed on supporting people and building communities (that can still include economic development). Citizens and other stakeholders in this new model of development become active agents in shaping their communities through harnessing local assets found in community capital.

Traditional economic development models have focussed on job creation and creating greater economic diversity to stimulate economic growth in regions. Increasingly, this development approach is being replaced by a more holistic approach that focuses on socio-economic growth. This approach to development moves beyond job creation by broadening its focus to community development. With this approach, the community is examined through another lens: that of community capital. Researchers have identified a variety of types of community capital: natural capital, physical capital, economic capital, human capital, social capital, and cultural capital. Examples of these capitals are noted in Table 8-6.

Exploring a community's infrastructure, skills and knowledge of its citizens, and its services and amenities and understanding how these can collectively contribute to and support tidal energy development may provide for greater community resiliency.

FOUNDATIONAL CONCEPT: RESILIENCY

Resiliency is "the capacity for humans to change their behaviours, economic relationships, and social institutions such that economic vitality is maintained and social stresses are minimized" (Quigley et al., 1996:35).

Table 8-6: Types of Capital

Natural capital	Physical capital	Economic capital
• Land • Soil • Groundwater • Surface water • Air • Minerals and Non-renewable Resources	• Infrastructure • Land • Transportation • Housing and Living Conditions • Public Facilities	• Labour • Job Creation • Financial Resources • Economic Structure • Economic Diversity
Human capital	**Social capital**	**Cultural capital**
• Education • Health and Well-being	• Citizenship • Safety • Social Networks	• Cultural Heritage • Identity and Diversity • Community Pride

Source: Based on Centre for Sustainable Community Development (2012) http://www.ccscan-ca.cscd.sfu.ca/stocks/

8.3.2 - SOCIAL CAPITAL

Social capital has received the most attention, as it is the social networks, relationships among stakeholders (i.e. trust, norms, shared values), and the level of citizenship that support the other types of community capital. Unlike the other forms of community capital, social capital cannot be observed on its own, but only in the interactions between individuals and among groups. As such, social capital does not simply exist, as a building or lake does, but requires action to establish and maintain it. The social networks that comprise social capital allow for groups to access resources and support, and to problem-solve. Activities within a community that help create feelings of tolerance, altruism, trust, and security can help to build social capital within a community. Conversely, situations that promote intolerance, greed, distrust, and fear will degrade social relations that promote community capital (Callaghan & Colton, 2008).

TOOL: COMMUNITY CAPITAL SCAN

The Community Capital Scan (CCS) is an Internet-based instrument developed by the Center for Sustainable Community Development of Simon Fraser University (Vancouver, Canada) and Telos, the Brabant Center for Sustainable Development of Tilburg University (Netherlands). The CCS offers the opportunity to gain advance insight into how projects or programmes are expected to contribute to the sustainable development of a community. This insight is obtained by asking all the relevant stakeholders involved in a project or programme to give their opinion of it by means of a structured questionnaire. The questions relate to the six capitals of sustainable community development: natural capital, physical capital, economic capital, social capital, human capital, and cultural capital. To facilitate interpretation, the outcomes are presented graphically. In addition, the scan offers an opportunity to make a wide range of suggestions for improvements to the project. There is also the option to fill in the CCS scan individually.

See: Community Capital Scan http://www.ccscan-ca.cscd.sfu.ca/ccs/

Tidal energy projects can support community capital by considering how the project can support and enhance other types of capital in the community, in addition to economic capital. Questions that can be considered include:

- In what ways can the community engagement process be leveraged to create ongoing community dialogue around other important community development issues?
- How can tidal energy development be approached in a way that enhances pride in community?
- How can tidal energy development support community health and wellness?
- How can tidal energy development enhance community capacity?
- How can tidal energy development be leveaged into other socioeconomic development opportunities?
- How can tidal energy development support/contribute to other community infrastructure?

Being thoughtful and deliberate is essential in contributing to community capital in the development approach. In planning a tidal energy project, these and other questions should be raised. There should be deliberate attempts to enhance community capital, as opposed to it being an unplanned by-product of a development process.

A critical component of working to increase community capital is by building community capacity. **Asset-Based Community Development (ABCD)** is a model for strengthening community capacity by focussing on the powers of local organizations and associations, the supportive functions of local government and non-government institutions, and the skills and knowledge of local residents and other stakeholders. ABCD has become a popular approach to development as it has reshaped how development occurs. Rather than approaching development based on the end goals of the community (e.g., jobs), it focuses on community/individual assets within a community (what currently exists) and how these might be used and simultaneously strengthened through an asset-based approach to development.

There are six important categories of assets within any community:

1. Assets of individuals,
2. Assets of associations,
3. Assets of institutions,
4. Economic linkages and business assets,
5. Natural resource assets,
6. Previous processes and plans for community and economic development.

For more information see: The Asset-Based Community Development Institute http://www.abcdinstitute.org/.

Tidal energy developers can benefit from using an ABCD approach by better understanding other assets in the community other than tidal assets (i.e., natural assets). For example, local people involved in commercial fisheries will have local knowledge of tides, fish, and marine mammals. They may have boats that may be able to service aspects of the tidal energy development activities.

VIGNETTE: TEAM TIDAL DIGBY

The Municipality of the District of Digby, in partnership with the Town of Digby and the Annapolis-Digby Economic Development Agency, have developed an economic development team called Team Tidal Digby. Team Tidal Digby is focussed on bringing tidal energy-related development to the Port of Digby and the local area. Team Tidal Digby is working to make the Town of Digby the port of choice for tidal energy developers in the Bay of Fundy. Recent promotional activities have had a high impact in terms of media coverage and in raising awareness of the Port of Digby's infrastructure and related amenities. Attendance at key tidal energy stakeholder symposiums, road shows to promote the Port of Digby, and well developed promotional material, including a brochure, have positioned the Town of Digby and the Port of Digby as a place to do business.

Underlying this strategy is an understanding of the needs of the tidal energy industry. Also, there is recognition the Port of Digby is well positioned geographically to deliver services to the tidal energy industry. Key capabilities at the Port of Digby that Team Tidal Digby promotes are fabrication, maintenance, repair and overhaul, testing, and deployment.

8.3.3 - COMMUNITY ASSET-MAPPING

Asset mapping has grown in popularity and is now seen as a critical tool in community and regional economic development. Used as a tool, it can provide the foundation for community development and strategic planning.

Asset mapping can involve:

- an inventory of community assets,
- a ranking of the most valued assets,
- an understanding of the connections among and between these assets,
- an understanding of why these assets are valued, and
- an understanding of the community's vision for the future.

Asset mapping is intended to promote connections and/or relationships among people, between people and organizations, and between organizations. Collectively, this knowledge can support development by building on the strengths inherent in the community. Asset mapping also identifies gaps and where they exist; planners, developers, and community leaders can coordinate initiatives to fill these gaps.

Methods used for asset mapping vary, but generally include participatory approaches that engage citizens and other local stakeholders. The Asset Mapping Handbook (http://www.rwmc.uoguelph.ca/cms/documents/11/Asset_Mapping1.pdf) provides examples of the methods that can be used in asset mapping.

8.4 - NICHE COMMUNITY-BUSINESS OPPORTUNITIES

Further, socio-economic benefits can be garnered by developing niche business opportunities that complement tidal energy development. Niche businesses often correspond directly to local community assets and community capital. Community-based business and entrepreneurial activities could include:

- Tourism: Tourists are increasingly interested in learning through experiential activities during their travel. Interpretive centres that provide hands-on learning, meaningful engagement opportunities with local people, and a chance to purchase a unique item/gift from the community or interpretive centre are important. Tourism development may complement a tidal energy development project as it presents an opportunity to teach people about the ecology (including human ecology) of the marine environment, the nature of the tidal cycle, the process of energy extraction from the tides, and the types of research undertaken that provides significant insight into the types of impacts of this type of energy extraction. The Tourism Industry Association of Nova Scotia's (TIANS) Best Practices (http://www.tians.org/programs/best-practice-resources) provides information on tourist markets, marketing, and product development.

- Greenhouses: For communities producing energy for locally-distributed grids (e.g. COMFITS), investing in greenhouses for growing fruits and vegetables presents both an opportunity and fills a need for locally produced goods. This opportunity might be especially important for remote communities. Specialty products, such as some herbs, can be grown and made available off-season to local and regional restaurants and specialty stores. Iceland has been using its geothermal energy resources since 1924 to heat greenhouses to grow various vegetables (See: Iceland National Energy Authority - http://www.nea.is/geothermal/direct-utilization/greenhouses/).

- Business/Start-Ups: Rural and remote communities may develop financial tax-based incentives to encourage and support the development of local businesses aligned with community assets and capital. Locally produced energy and agreements between power developers and local governments might provide opportunities for lower energy costs to support business development.

VIGNETTE: ANNAPOLIS TIDAL STATION

The Annapolis Tidal Station came online in 1984. This tidal energy generating station is based on a barrage model. In this model, the tidal Annapolis River is dammed and water is funneled through a tidal generating plant. The tidal station doubles as an interpretive centre and is a noted tourism attraction in the region. Visitation numbers suggest that people are interested in learning about innovative renewable energy opportunities like tidal energy.

8.5 - OWNERSHIP MODELS

The level, type, and disbursement of benefits from a renewable energy project are largely contingent on the project's ownership model. Table 8-7 presents three types of ownership models: local, shared/partnership, and developer ownership. Each ownership model is unique and will have its own benefits, costs, strategies, and governance models.

Tidal energy development may provide rural, island, and other remote communities with energy that may allow for development of local small-scale industries such as greenhouses, tourism-related activities/facilities, or small-scale manufacturing. Any ownership model can produce these types of opportunities. Choosing the model will depend on resources available, the mix of stakeholders, and the willingness to take on the risks associated with ownership.

Photo Credit: Leigh Melanson

Table 8-7: Pros and Cons of Different Ownership Models

MODEL	PROS	CONS	STRATEGIES FOR DEVELOPMENT	GOVERNANCE
Local Ownership	Lower energy costs and reliable supply either directly or indirectly Use of local business/services Local income generation Greater local/community acceptance of renewable energy project Greater local control of siting and overall project management Opportunities for empowerment Encourages socially responsible investing	Risk is solely with the community Experience may be limited Competition for funding can be high Community may be responsible for decommissioning costs Community members may experience "burnout"	**CEDIFs:** A Community Economic Development Investment Fund (CEDIF) can be created to support local ownership. The CEDIF committee must have at least six elected directors. Their role is to manage the CEDIF fund, which is created by a pool of capital raised through the selling of shares to members in a defined community. **Municipal Investment:** Municipalities may be able to invest directly in a renewable energy project like tidal energy. However, limits to direct municipal investment will be limited and based on legislated bylaws. **Bylaws/MPS:** It is necessary to develop the appropriate bylaws within a Municipal Planning Strategy (MPS) that support tidal energy development. Integrated Community Sustainability Plans (ICSP) may also provide an opportunity to develop strategies that enable tidal energy development.	The measures outlined below will support governance in locally owned energy projects. **Terms of Reference (TOR):** This document should outline a communication strategy, identify how benefits/costs will be shared, address how conflicts of interest might be managed, and outline other key management issues. The TOR must also include information regarding the election of officers/members of management committee. **Project 0 & M:** Key factors in Operations and Maintenance include administration, conduct of operations, equipment status, operator knowledge and performance, conduct of maintenance, and preventative maintenance. **Community updates:** How the community will be kept informed of the project, its status, and rates of return is another consideration. On-going community updates will be important and be accomplished through municipal website, flyer in the mail or with a local bill such as water, and public meetings. **Distribution of funds:** Terms of reference for the distribution of funds at the outset of the project is important and must be transparent. Rules and procedures for a periodic review and modification of distribution of funds to deal with arising community needs will be necessary.

MODEL	PROS	CONS	STRATEGIES FOR DEVELOPMENT	GOVERNANCE
Shared / Partnerships Ownership	Use of local business/services Financial strength and credit capacity Technical expertise Local recognition and acceptance Project development and technical experience Community sweat and financial equity	Investment risk to all partners Values may not be consistent among partners Reputation of partners is at risk if project fails Equitable decision-making among partners is challenging	The COMFIT program provides partnership opportunities if the community has a major share of ownership (> 50%). Other considerations include the need to: • Develop partnerships based on shared values • Determine the contribution of each partner • Determine majority and minority rights • Determine financing arrangements • Determine operational decision-making • Determine exit mechanism	Governance will require the development of a coordinating body. Coordinating structures could include: • Steering Committee • Task Force • Ad Hoc Committee • Standing Committee The coordinating body will be responsible for determining how: • decisions are made and by whom; • leaders are chosen; • members are chosen; • information is shared; • conflict is managed; • risk is managed; • day to day activities are carried out by the organization; and • staff are managed.
Developer Ownership	Use of local business/services Local share-holding opportunities Sharing of data on marine environment and other areas Developer sponsored community initiatives	Lack of local control over local marine resources Decommission risks Foreign ownership and/or rights to natural resources	Nova Scotia's Tidal Array Feed-in-Tariff (FIT) (http://nsrenewables.ca/tidal-array-feed-tariff) program for Independent Power Producers provides opportunities for developer ownership. The FIT applies to tidal devices in units greater than 0.5MW or set up in arrays. There are no limits on ownership.	Developer-owned projects will likely require: • Development agreements between project partners • MOUs (Memorandum of Understanding) between regional/provincial government and, in some cases, local government

8.6 - MOVING TOWARD ACHIEVING SOCIO-ECONOMIC BENEFITS

In order to better realize the socio-economic benefits related to tidal energy development, it is useful to incorporate the following elements into the planning of tidal energy projects.

BEING PROACTIVE - Local and regional governments must be proactive in order to maximize benefits and minimize costs associated with tidal energy development. Being proactive will involve becoming knowledgeable about renewable energy development. Participating in local, regional, and/or provincial renewable energy-related forums will provide this type of knowledge.

EDUCATION - Developing community buy-in across the stakeholder spectrum is essential in achieving socio-economic benefits. Opportunities for education should be developed and can include public open houses, newsletters, and school-based education initiatives.

PARTNERSHIPS/NETWORKING - Developing strategic partnerships and strong networks with government, local community organizations, and energy producers can support local and regional economic development.

VISIONING - Local/regional government and regional economic development authorities (RDAs) should establish a vision for their energy future supported by strategic planning. Many municipalities have already addressed this with Integrated Community Sustainability Plans (ICSP's).

8.7 - CHECKLIST FOR COMMUNITIES

The following is a checklist that will help a community consider whether it has skills, expertise, or services that could supply tidal energy projects. Ultimately, the checklist serves to help identify what type of strategy could be developed to participate in the tidal energy supply chain.

Checklist for Communities

1 Is there a task force, committee, or other network actively looking at tidal energy opportunities in your community?

2 Do you have a complete and up-to-date labour force profile (wages and benefits, supply and occupational categories, skills, latest employment data, employment forecasts)?

3 Do you have a complete and up-to-date list of education institutions (local or area) or others who are able to supply training relevant to tidal energy development?

4 Are necessary business support programs in place to assist new tidal energy companies to establish and to assist existing businesses to take full advantage of supply chain opportunities presented?

5 Are economic development and local officials joining networks and attending seminars and workshops to learn about current and future tidal energy development in your region?

6 What expertise could be brought into the community or attracted by nearby tidal energy development?

7 Does the Economic Development Coordinator/local RDA have a working knowledge of renewable energy and know where to get further information?

8 Does the community have an up-to-date community development strategy, an Integrated Community Sustainability Plan (ICSP), a strategic plan, or something similar?

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