Laying the penstock, Tla-o-qui-aht First Nation.
B.C. FIRST NATIONS CLEAN ENERGY TOOLKIT

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for the B.C. First Nations Clean Energy Working Group
November 2015
CHAPTER 1: INTRODUCTION

1.1 Why Clean Energy?
   1.1.1 Rights
   1.1.2 Environmental
   1.1.3 Social
   1.1.4 Capacity Building
   1.1.5 Risks to First Nations in a Clean Energy Project

CHAPTER 2: FIRST NATION FOUNDATIONAL DOCUMENTS

2.1 Introduction
2.2 Land Use Plan
2.3 Community Energy Plan
2.4 Financial Planning
   2.4.1: Financial Policies
   2.4.2: Member’s View of Financials
   2.4.3: Financial Plan, priorities and strategies

CHAPTER 3: COMMUNITY CONSULTATIONS—INTERNAL FIRST NATIONS

3.1 Internal Community Consultations
3.2 Community support for developing clean energy—internal
3.3 Community mandate at the start of project checklist
3.4 Community consultation at pre-feasibility checklist
3.5 Community consultation at Feasibility Stage Checklist
3.6 Community consultation at Operations and Maintenance
CHAPTER 4: CHOOSING THE KIND OF CLEAN ENERGY PROJECT

4 Step One: Choosing the Kind of Clean Energy Project

4.1 What is Geothermal?

4.1.1 Advantages to Geothermal

4.1.2 Technology Needed

4.2 What is Run of the River Hydro?

4.2.1 Advantages to Run Of River

4.2.2 Choosing a viable Run of the River Project

4.3 What is solar?

4.3.1 Why Solar?

4.3.2 Checklist for Solar

4.3.3 Technology Use for Solar

4.4 What is Wind Power?

4.4.1 Advantages to Wind Power

4.4.2 Checklist for Wind power

4.4.3 Steps for Installation of Wind Tower

4.5 Ocean Energy: Wave and Tidal and thermal

4.5.1 Advantage to Ocean Energy

4.6 BioEnergy

4.6.1 Advantages to BioEnergy

4.6.2 BioEnergy Technology

4.6.3 Checklist for BioEnergy

4.7 Step Two: Choosing Type of Clean Energy to Develop and Checklist

CHAPTER 5: PRE-FEASIBILITY

5.1 Overview of General Framework for Clean Energy projects

5.1.1 Meet Technical Aspects of CEP

5.1.2 Meet Commercial Aspects of CEP

5.1.3 Permitting Aspect of CEP

5.1.4 Assess Resource for CEP

5.1.5 Assess Potential Site

5.1.6 Interconnection to Grid

5.1.7 Key Factors to Determine Cost of Interconnection

5.1.8 Are you Connecting to Distribution or Transmission lines?

5.1.9 Impact of project on Rights, Environment, Land and Water

5.1.10 Preliminary Project Design

5.1.11 Preliminary costs

5.1.12 Risks and Risk Planning

5.1.13 Regulation Process

5.1.14 Clean Energy Project timeline

5.1.15 Investigative phase

5.1.16 Application

5.1.17 Construction and Operation Phases

5.1.18 Insurance needs

5.1.19 Financing Clean Energy Projects
This toolkit is designed to assist First Nations in understanding the kinds of clean/renewable energy there are, how to begin looking into doing a clean energy project, pre-feasibility, feasibility, developing, financing, relationship building, opportunities, and where to find resources.
DISCLAIMER

This toolkit is designed as a guide, a step-by-step, how to manual. It is not intended to be legal or technical advice. It is only to provide helpful information on how to develop a clean energy project. Links are provided for government requirements and laws and First Nations should seek legal counsel and technical expertise whenever it is necessary. First Nations should work closely with FrontCounterBC, BC Hydro and other agencies to provide all the necessary information to get the permits, licenses and other authorizations they require for their clean energy projects. Under no circumstances are the First Nations Clean Energy Working Group or the author of this toolkit to be held liable for damages based on the use of this information.

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Intake at Hupacasath China Creek project. (Photo: Judith Sayers)
FOREWORD

This toolkit was made possible by funding from the Ministry of Aboriginal Relations and Reconciliation (MARR) and BC Hydro that was provided to the First Nations Clean Energy Working Group (FNCEWG). Many thanks are owed to MARR and BC Hydro for supporting the FNCEWG in pulling together a tool that will help First Nations develop further projects.

The FNCEWG group was started in 2007 when a group of First Nations including shíshálh, Squamish, Sliammon, and Sts’ailes undertook negotiations with the Province that resulted in revenue sharing for IPPs and created the First Nations Clean Energy Business Fund (FNCEBF). Later this group expanded to include the Lil’wat and Klahoose Nations.

In 2011, a Memorandum of Understanding with Clean Energy BC (CEBC) was also signed to ensure First Nations’ opportunities and involvement in this sector. Over the last several years, this group of First Nations worked to implement the First Nations Clean Energy Business Fund (FNCEBF) and to respond to BC Hydro’s plans for development including the Standing Offer Program (SOP) and the 2013 Integrated Resource Plan (IRP). In some ways, their suggestions were implemented in the IRP including increasing the SOP; however, they believe considerable work remains to be done. It is through this working relationship with BC Hydro and MARR that this financial support has been made possible.

The First Nations Working Group on Clean Energy has expanded to include a large number of First Nations who are involved in the industry, or are developing or wanting to develop Clean Energy Projects. Many of these First Nations requested a toolkit be put together to assist in their endeavours to develop projects.

This toolkit was put together by Kekinusuqs, Judith Sayers, under the direction of the First Nations Clean Energy Working Group. The toolkit was designed to bring information on how to do a clean energy project into one location and utilized existing toolkits and materials to create a compilation. Additional information was added that was not in any of the existing toolkits. Thanks to all those who helped such as CorpFinance International Ltd. and Sigma Engineering who helped with the financial projections sections. Thanks also to Clean Energy BC for hosting workshops at Generate 2014 and 2015 on the toolkit’s development.
1.1 WHY CLEAN ENERGY?

Clean or Renewable Energy has become an important industry for First Nations. It has been an industry First Nations have embraced because projects can be developed with minimal impacts to their rights, environment, and within their values. There are opportunities to compete in an industry that has made it easier for First Nations to get a foothold into. There are several projects where First Nations have led and developed their own projects in B.C. There are also many Independent Power Producers that consider it important to work with First Nations within their territories and have done so or are currently developing projects together.

The kinds of benefits that First Nations find in the clean energy sector are as follows:

**1.1.1 RIGHTS**

1. Building clean energy projects with minimal impact on First Nation rights
2. Choosing locations that do not impact important spiritual, cultural or where there are fisheries or other important resources that are used for exercising rights.
3. Exercising the right to use resources, or use of aboriginal title resources
4. Manage resources at an environmental standard that is important to the First Nation

**1.1.2 ENVIRONMENTAL**

5. Determining what kinds of clean energy is acceptable to First Nation communities and where projects will be located.
6. Managing First Nations territories and resources within their own environmental standards that protect what is important to them.
7. Reduces greenhouse gas emissions (GHG)
8. Mitigates impacts of climate change
9. Fisheries rehabilitation or other environmental innovations that come from the project.
1.1.3 SOCIAL

10. Training and Jobs: This includes training for jobs in construction, development, operations and management.
11. Provides training/capacity building to the First Nation in developing a clean energy project from start to finish, project management, and operations and management.
12. Builds capacity for future clean energy projects and initiatives
13. Creates long term, high quality jobs and skills
14. Revenues from project: Includes dividends from the project and any revenue sharing agreements the First Nation negotiated with the government/company
15. Can become the symbol of the community
16. Reduces health risks to members and general public by reducing GHG emissions
17. Creates regional energy security
18. Community pride from having a project that falls within the values of the First Nations while creating many benefits.
19. Diversifies the economy
20. Recognition of the contributions of First Nations in clean energy have been given awards from Clean Energy BC Merit Awards, Blue Planet awards, Nuu-chah-nulth Development Corporation Awards and BC Aboriginal Business awards to name a few.

1.1.4 CAPACITY BUILDING IN BUSINESS, OPERATIONS AND MANAGEMENT

21. Building capacity in business: First Nations learn how to build a business and make it successful through prudent financial management, policies and plans.
22. Developing project and project management
23. Operations and maintenance of project, members are trained to carry out the various jobs related to the project
24. Board of Directors: members are trained in being on boards, setting policy, overseeing financial and setting budgets.
25. Members are trained in reviewing financial statements and corporate structures differing from First Nation.
26. Each project can bring other benefits to their community depending on the location and priorities of the First Nation.

This list of benefits to First Nations developing clean energy in their territories is not exhaustive. First Nations have had their own unique experiences that could be added to this list.
1.1.5 RISKS TO FIRST NATIONS IN A CLEAN ENERGY PROJECT

Just as there are benefits to First Nations there are risks to First Nations in building Clean Energy Projects. As in any business, there are risks that should be thought of ahead of time and planned for. Possible risks include:

a) **Changes in climate**: as temperatures are warming, more streams are facing drought conditions. Winds are changing and may come in greater force and more often. Take steps to do climate change modeling as part of your feasibility to ensure you are looking to changes in water levels, wind speed or hours of daylight. Also ensure that your project is built to withstand severe weather events.

b) **Financial**: Like any project, unexpected increased costs in construction or equipment or labour can occur. Make sure you have a healthy contingency budget and carefully studied all aspects that may increase in costs due to unseen events. First Nations should ensure that the corporation limits its liability by incorporating companies and not taking on any guarantees that cannot be handled financially by the First Nation. Ensuring your insurance is adequate and comprehensive will also help mitigate risk. You can also make use of service contracts with hardware suppliers to transfer operational risk.

c) **Political/regulatory risk**: Changes in governments with different views on clean energy can be a risk. Ensuring you keep up good relations with all government parties, and letting them know of the benefits to your First Nation and the province in general will hopefully keep them from making policies or laws or decisions that will impact negatively on your project. Regulatory risk is a factor, changes in laws and regulations can occur during the life of your project. Just ensure you work with governments that may want to make changes that will not be beneficial. Mastering the art of lobbying and relationship building are important skills to develop.
CHAPTER 2
FIRST NATIONS FOUNDATIONAL DOCUMENTS BEFORE YOU START A PROJECT

Having an Economic Development Plan, Land Use Plan, Community Energy Policy and Human Resources Database in place before you start a project makes it easier to find an acceptable location and follow set standards and community direction.
2.1 FIRST NATIONS FOUNDATIONAL DOCUMENTS THAT COULD BE DONE PRIOR TO OR IN CONJUNCTION WITH DEVELOPING A CLEAN ENERGY PROJECT:

I. ECONOMIC DEVELOPMENT STRATEGY: Sets out the goals and objectives of the First Nation and how those goals will be achieved. See draft outline for an economic development strategy in 2.2.

II. LAND USE PLAN: sets out where development can and cannot occur within the territory and also set environmental standards that the community will follow. As most projects are within the territory and not on reserve, a Land Use Plan is important. A Comprehensive Community Plan deals with on reserve development and if a First Nation is planning projects on reserve, it would be important to have this in place as well. A Land Use Plan is usually based on a Traditional Use Study where the First Nations has documented all known sites, gathering areas and other uses of the land. See 2.2 below for more detail.

III. COMMUNITY ENERGY PLAN: Sets out energy goals. Undertaking baseline studies that assess First Nations current and future energy needs, identify energy efficiencies and analyze renewable energy option. See 2.4 below for outline for energy plan.

IV. FINANCIAL PLANNING: First Nations develop a document that directs where revenues/dividends from a project will be used. e.g. More economic development, education fund, youth or elder centre, arts, sports, or per capita distributions.

V. COMPREHENSIVE COMMUNITY PLAN: A CCP should be completed if any of your project infrastructure is on reserve.

VI. HUMAN RESOURCE DATABASE:

- Prepare database that includes the skills, education and experience of all your members
- Will help you determine if you have enough workers for your project and if enough lead time, the kind of training you will need to do before studies and assessments, project construction and operations.
- Included in your database should be any companies that are run by your members that can provide goods and services to the project.
- Produce a list of jobs and opportunities that will come available once construction has begun so that members can get the training they need or prepare to bid on contracts to construct project.
2.2 LAND USE PLANNING:

A Land Use Plan (LUP) is a comprehensive plan that deals with the entire territory of the First Nation. This sets out areas where there should be no development at all, and areas with higher environmental standards. LUP are for:

- Assertion of territory
- Protect rights and important areas
- Used as a tool of consultation/Shared Decision Making (SDM)
- Provide certainty to investors and to First Nations
- Identifies areas for protection
- Identifies areas for development
- Sets Standards for development

The Gwich’in Land Use Plan says it is a plan to look after the land and the people now and in the future. Chief Kerry Moose’s guide to Land Use Planning is a useful document to help with this and there are many other First Nations LUP on the web. (See resource section.) There is no required format for a LUP, and there are many differing LUP out there including the Taku River Tlingit.

2.3 DRAFT OUTLINE OF A COMMUNITY ENERGY PLAN (CEP)

Having a Community Energy Plan in place before doing a clean energy project is ideal but putting one together as you are developing your project also works. Why do you need a CEP?

- Create a more environmentally, socially and economically sustainable community.
- Understand both energy supply and demand and improve energy use from a single building to the community as a whole
- Provide leadership in the use of energy
- Promote a cleaner approach to generating electricity
- Provides a plan to decrease use of power in the community setting out methods of how that can be achieved.

The following is a proposed outline for a Community Energy Plan. More can be added and with the help of technical people, all the areas needed for a CEP will be covered. A community’s area of interest can also be expanded upon. This is intended only as a guide. You have to ensure that a CEP provides useful information to your First Nation and sets out a plan that can help you use energy more wisely and to create energy in a way that is acceptable to the members of the Nation.
## DRAFT OUTLINE OF A COMMUNITY ENERGY PLAN (CEP)

<table>
<thead>
<tr>
<th>1. Provide Background</th>
<th>Background on First Nation, what is Community Energy Planning and existing Energy System.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Outline the First Nation’s Energy Objectives</td>
<td>Process to set First Nation objectives through Advisory Committee (composed of people with experience in energy, local governments, AANDC, etc), surveys, community meetings, education initiatives, etc.</td>
</tr>
<tr>
<td>3. Education Initiatives</td>
<td>Community initiatives which support the implementation of sustainable energy through increased awareness of economic and environmental issues around energy.</td>
</tr>
<tr>
<td>4. Determining the Energy Demand of the First Nation—also referred to as Community Energy Mapping</td>
<td>Show how information is gathered—methodology: Energy Demand Assessment, annual and community consumption breakdown, analysis and forecasting of future use. Determine costs of Energy for community-residential/community offices and buildings. Completion of a community energy plan by undertaking a financial, environmental, social and technical assessment of energy options.</td>
</tr>
<tr>
<td>5. Energy Supply</td>
<td>Where does energy come from? Do an economic analysis of proposed clean energy project(s.)</td>
</tr>
<tr>
<td>7. Conclusions</td>
<td>Findings and Recommendations Includes quantifying benefits such as reducing GHG. Next Steps.</td>
</tr>
<tr>
<td>8. Resources Needed</td>
<td>Use of power and fuels bills, meters, First Nation financial statements/budgets and other sources like BC Hydro who can provide this information. Use an engineering firm or community energy organization to help put together the CEP. Check out firms that have done CEPs. Follow the steps in Chapter 4 below to inventory the territory for possible renewable energy projects.</td>
</tr>
</tbody>
</table>
2.4 FINANCIAL PLANNING

Financial planning is a very important function to carry out both for the First Nation and for the proposed clean energy project. If financing is required, the First National financial track record will help prove capacity in handling money.

2.4.1 FINANCIAL POLICIES:

In order to get loans, or grants, having good financial systems in place is essential. Having Financial policies that sets how money is spent and accounted for is very important. Being in good financial standing is also critical.

2.4.2 MEMBER’S VIEW OF FINANCIALS:

The First Nations Financial Transparency Act (FTA) requires that members receive copies of the First Nation’s audit within 120 days of the end of the fiscal year. If the FTA is repealed, Chief and Council should continue to provide financial statements to members. There should also be a policy that members are able to access the audits of any company that is owned by the First Nation. If you would like to ensure member’s support, allowing them to view the financials of the project is important.

2.4.3 FINANCIAL PRIORITIES OR STRATEGIC PLAN:

The Nation should set up early in the economic development process how profits/dividends from businesses will be allocated. Priorities for how the money will be used can be done in many different ways. For instance you could use percentages for priority areas of the community. As an example 25% could be reinvested into existing or new businesses, 15% to capital projects, 10% to Education, 15% to youth programs, 15% to elders programs, 10% to culture and language and 10% to per capita. Community members should set their priorities. There should also be law/policy on how this policy can be changed. e.g. Does it need 30 days notice to change? Greater than 50% of members voting yes to change? Some First Nations set up a fund that revenues/dividends flow into. The fund can be for culture, language, education, habitat restoration or whatever the community sets as priorities.

Aboriginal Financial Officers Association also offers a Priority Setting Tool that you can look at as well in Chaper 19 on Resources on Financial Plans.

WestBank First Nation takes a different approach and their Financial Strategic Plans sets out their goals and priorities.
### 2.7 DRAFT PROPOSED OUTLINE FOR A FIRST NATION ECONOMIC DEVELOPMENT STRATEGY

| 1. Introduction | Describe why there is a need for economic development in the community |
| | Describe why the community wants to get involved in economic development |
| | Lay out the process the community went through to put together strategy |
| | Outline the community consultation |
| 2. Developing a Framework | Mission Statement |
| | Goals to achieve sustainable economic development |
| 3. Community’s Perspectives | Role of Chief and Council in economic development |
| | Role of members in economic development |
| | Community strengths and weaknesses |
| | Employment interests |
| | Training and education |
| | What is important to community in terms of maintaining way of life, continuation of exercise of rights and environmental standards to maintain ecosystems to support rights |
| | Clash of culture and business—how is it resolved? |
| | Community Businesses: What businesses would members like to see or? |
| 4. Socio-Economic Trends | What is current population and projections for increases? |
| | What is the breakdown of age group? Is one age group more dominant? |
| | What is trend in outside labour force? |
| | What is level of skills and education in First Nation? |
| | What are the general trends in BC Labour Force? |
| | What are the trends in surrounding cities, communities? |
| | Who are the key businesses? |
| | Any best practices or lessons learned in businesses surrounding First Nation? |
| | Could undertake a Labour Market Study: Understanding what the overall labour demand for the area the First Nation is in. Could be key and critical to develop businesses or to respond to the needs of existing business |
5. What are the opportunities in different sectors? *(specific to your area)* eg:
» Alternative Energy
» Tourism
» Retail and services
» Manufacturing
» Agriculture
» Forestry and forest products
» Other?
» Specific Business Ventures: What is your First Nation involved in now?
» Opportunities Summary

6. Environmental Scan
Identify:
» Strengths
» Limitations
» Opportunities
» Constraints

7. Who will do Economic Development? Developing the Foundation
» Chief and Council? Economic Development Corporation? Committee? Other?
» Define relationship between Chief and Council and members and economic development corporation/committee-
Accountability
» Define the responsibilities of the body that will carry out the work
» Analysis of businesses or proposed business
» Feasibility Studies
» Business Planning
» Financing

8. Organizational Capacity
» Are physical, human and financial resources available to implement the strategy?
» Understanding what level of education, types of training, certificates, expertise, each employable member has is important to know when you are looking to get involved in a business. Capacity gaps must be noted and training started at the appropriate time in order for train people for jobs in proposed development, or get them into training programs or university.
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>9. Business Climate</strong></td>
<td>» Does your community have a positive business climate that fosters growth and innovation?</td>
</tr>
</tbody>
</table>
| **10. Relationship Building, Partnerships** | » Is your community willing to create partnerships with neighbouring communities, other levels of government and the private sector?  
» Are there overlap/shared territory issues that need to be addressed? |
| **11. Infrastructure** | » Is the existing infrastructure in your community able to support economic development?  
» If not, what is the plan to develop needed infrastructure needed for economic development? |
| **12. Financial Resources** | » Is there access to additional financial resources to undertake new projects?  
» First Nations need to have a good financial record or performing in the black, good financial safeguards, a good track record of accounting for any program dollars, proposal/grant money, budgeting skills, financial reporting to members, and other systems in place. |
| **13. Strategies for Economic Development** | *Moving Forward:*  
» Lay out Strategies  
» Action Plan: Sets out Objectives, Actions, Key Responsibilities and Actions, outcomes and time frame for each strategy. Set out who is responsible for implementation. |
| **12. Appendixes** | Add any Appendixes that may be important to the Strategy |
Assess what capacity you have in your community and what sort of experts you may need to hire to fill in the gaps or to train members further.
3.1 WHAT YOUR COMMUNITY MAY NEED FOR A CLEAN ENERGY PROJECT

Assess what you have in community and what sort of experts you may need to train or hire to fill in the gaps.

- Know the interests of your community in clean energy
- Know what community clean energy goals are
- Identify a community clean energy champion who will remain as champion throughout the entire project
- Knowledge of the community baseline use of energy
- Ability to assess renewable resources
- Expertise in writing applications for study
- Funding for studies—soft costs
- Good communications with members—established processes for consultation
- Provide information to members to ensure informed decision making
- Have business capabilities
- Know how to do risk assessment
- Can attract and obtain financing/funding
- Skills in project management
- Ability to build relationship and consult with neighbouring local governments, First Nations, stakeholders
- Skills to obtain permits and follow up on any conditions set in permits or licenses
- Construction trades training and electrical operations training and electrical utility operations
- Negotiations skills to negotiate Electricity Purchase Agreement (EPA) or Impact Benefit Agreements (IBA’s)
- Business expertise, planning, budgeting and reporting, supervising, project management and succession planning.

3.2 COMMUNITY SUPPORT FOR DEVELOPING CLEAN ENERGY—INTERNAL

Community Engagement is key to be successful in exploring, determining kinds of clean energy, developing and operating the project. The Tsilhqot’in decision at the Supreme Court of Canada ruled that any rights belong collectively to the members meaning that they have a say in how their rights are used. The case also stated that resources must be used so that future members can enjoy their rights so this means that all resources cannot be taken all at once or even over a period of time. The Tsilhqot’in case sets a higher standard for members say over their rights and community consultations must be done thoroughly.

The economic development strategy can be a place where the First Nation gets its mandate to develop clean energy on behalf of the community. If the First Nation does not have an economic development strategy then obtaining a mandate through engagement sessions would be important. The following is a checklist of when engagement should occur through the project. This is only a guide and more sessions of other ways of keeping the community informed can always be added.
3.3 COMMUNITY MANDATE AT THE START OF PROJECT

☐ Does your First Nation have a mandate to look into clean energy options for the territory? i.e. Economic Development Strategy or specific mandate to develop clean energy projects?
☐ Did members participate in a visioning exercise for clean energy?
☐ Did members participate in goals setting for clean energy?
☐ Does First Nation have cultural protocols or policies in place for use of land, water and other resources, and identify any other use of culture in development of project?
☐ Have you provided community members information on the types of clean energy options available within the territory?
☐ Have you provided the results of the inventory of types of clean energy available with recommendations on what to do further prefeasibility work on?
☐ Have members approved project site?
☐ Have members given a mandate to proceed with further studies and preliminary feasibility?
☐ What opportunities are there for members for jobs and training, contracts and procurement?

3.4 COMMUNITY ENGAGEMENT IN PRE-FEASIBILITY STAGE

• Did you share main points from feasibility studies with members and in particular any studies that show impacts to rights and environment?
• Update members periodically on information received and any action undertaken
• Members approve more detailed studies to be done in feasibility stage.

3.5 COMMUNITY ENGAGEMENT DURING FEASIBILITY STAGE

• Will any community funds be contributed to project and if so is members consent needed, or support in principle?
• Did Chief and Council or Economic Development Corporation share the financing structure and commitments with members? You will want to show higher level financials with members showing expected revenues and costs (generally.) You will want to illustrate how profits will grow over time as loans are paid down.
• Were members informed on business structure for project?
• Did members give final consent to project go ahead?

3.6 COMMUNITY CONSULTATION DURING CONSTRUCTION AND OPERATIONS

• Were members included in any celebrations to break ground of project, any ceremonies regarding the taking of the water or to celebrate project completion?
• Members are given regular periodic updates on construction of project and operations when the project is up and running.
• Do members have a forum or person to report any concerns of the project?
• Members are provided yearly with audits of financial statements within 90 days of completion of audit
• A structure on how the company is accountable to the Chief and Council/members is established
Signing MOU between Clean Energy BC and First Nation Working Group (Photo: Clean Energy BC)

Bottom Row left to right: Chief Harvey Paul-Sts’ailes, Eppa-Gerard Peters-In-chuk-ch, Chief Gordon Planes-Tsouke, Chief Roland Wilson-West Soberly, Chief Calvin Creaghan-shishahl, Chief Clint Williams-Sliammon

Standing left to right: Chief Patrick Michell-Kanaka Bar, Chief Ralph Dick-We wai kai, Minister John Rustad-MARR, Paul Kariya-CEO CEBC, David Dorrans-Lil’wat, Jasmine Paul-shishahl, Katie Terhune-FNEMC, Donald McInnes-Chair CEBC, Carleen Thomas-Tseil-Waututh, Judith Sayers
Do an inventory of resources in your territory to decide on the best type of clean energy project.
STEP 1: Do an inventory of resources in your territory to decide on best type. If you already know the type of clean energy you want to produce, an inventory is not necessary.

You need to determine:

» Is there enough of the resource for a project? 
  e.g. continuous wind, steady flow of water, enough material for biomass, wave or tidal power possibilities
» The location of the proposed project does not fall in sensitive areas, or areas of importance to the First Nation
» Can include any existing facilities that can be used to create renewable energy (waste, water, etc.)

Inventory could include the following types of energy:

- Geothermal
- Run of River
- Solar
- Wind
- Ocean, Wave and Tidal
- Bioenergy
4.1 WHAT IS GEOTHERMAL?

Geothermal means earth heat. It is a form of renewable energy utilizing subsurface hot water or steam created by the heat beneath the earth’s surface. Geothermal power is cost effective, reliable, sustainable and environmentally friendly.

4.1.1 ADVANTAGES TO GEOTHERMAL

- Geothermal results in a net environmental improvement relative to existing energy production (e.g. from fossil fuels) Does release GHG trapped in the earth but is much less than fossil fuels.
- Is energy from environmentally and socially responsible development
- Geothermal power plants are “baseload” power sources. They can operate continuously at up to 98% capacity because they have a constant source of “fuel” and require little downtime for maintenance.
- Geothermal plants are not affected by changing weather conditions.
- Initial investment is high, lifetime costs are low because the fuel source is free, it is located at the generation plant site (no transportation costs) and it is renewable.
- Large-scale geothermal operations require economic transmission links.

4.1.2 TECHNOLOGY USED FOR GEOTHERMAL ENERGY

The physical facilities required for a geothermal power plant include production and injection wells, a gathering and injection system, a power generation plant and a transmission line.

- Production wells are constructed by directional drilling from a small number of drill pads depending on the size of the reservoir. This reduces both project costs and potential environmental impacts.
- Wells are drilled using established technology similar to that employed in the oil and gas industry.
- The gathering system consists of pipelines that transport the steam or hot water from the wellheads to the generating plant that uses standard turbine technology. An injection system uses non-productive wells to return process water to the underground reservoir.

Figure 1: How Geothermal works
4.2 WHAT IS RUN OF THE RIVER HYDRO?

Run-of-River hydroelectric (ROR hydro) projects generate electricity by using part of stream flows and natural elevation differences found in mountainous regions. With ROR hydro, water is collected at an intake structure that flows into a buried pipe/penstock. The water flows through the penstock gaining speed through the head and hits the turbine causing it to spin. A generator is directly attached to the turbine and creates electricity. The water from the turbine is discharged unaffected back into the stream. Micro Hydro is less than 1 MW, Small Hydro ranges in size from 500kW to about 47mW.

4.2.1 ADVANTAGES OF RUN OF RIVER HYDRO

- Only a portion of the stream flow is affected, and even then, only a short length of the river experiences reduced flows (the so called “diversion reach” between the intake and the powerhouse).
- Use of water is non-consumptive and the water is returned into the stream at the powerhouse and the natural downstream flow pattern is preserved.
- Minimal environmental impacts on stream.
- Can be used on different size streams/rivers.
4.2.2 RUN OF RIVER CHECKLIST FOR CHOOSING VIABLE PROJECTS

- Are there streams/rivers water sources with sufficient flows 8–10 months of the year in your territory? Based on financial viability. If you have already done an inventory, you will know which streams are viable. If not, you can do a desk top assessment of possible streams.
- Have you reliable water data either by placing instream monitor for a year, existing data or extrapolating water day from nearby streams for prediction (hydrology study)
- Is there enough of a head, or height of vertical drop from site of proposed intake to powerhouse?
- Is the Flow fast enough to produce power?
- What is effect of climate change/global warming on water flows
- Does the stream/river have any spiritual or other cultural values that must not be disturbed. May want to rule out this stream.
- Does stream/water have fisheries values that you do not want disturbed? or is project high enough up the mountain that fish that is used by your members won’t be interfered with? May want to rule out this stream if it will negatively impact on fish species that are used by members.
- Are there species at risk issues? If so, may want to find another stream or are there ways to mitigate the impacts on species?
- How close is the proposed area of project to the grid? (cost effective transmission access)
- Is the terrain too steep to get equipment in or can you use helicopters to get equipment in to build the project?
- the ability to operate with minimal or no negative impacts on aquatic and terrestrial life. (this will be determined through studies but if you know of any value in the stream you want untouched, rule out the stream)
- Do you want a green project? if so, cannot do storage
- Is there enough space/area to build penstocks for the distance you need.
- Is there enough space/area to build powerhouse?
- Will you affect other uses in area including mining claims in area
- Is proposed site accessible by roads or if no roads, is the terrain able to be used to construct roads. If you plan to use forestry roads you will need to work with province and forest companies on permit to use roads.
4.3 SOLAR

Solar photovoltaic (PV) power is the conversion of sunlight into electricity via solar cells within a solar panel or module. The PV cell consists of one or two layers of a semi-conducting material. When light shines on the cell it creates an electric field across the layers, causing electricity to flow. A PV system does not necessarily need bright sunlight. It can also generate electricity on cloudy days with diffuse light conditions. Solar panels come as small as a few watts to larger amounts of power, and solar panels can be combined to produce as much power as you would like and have capacity for. Panels need to face south and inclined at an angle that is equal to the latitude of the location. Panels can be mounted on a roof, or on a fixture on the ground. They can be permanently fixed or installed to track path of sun. If you are off-grid, a battery is required to store electricity generated.

4.3.1 WHY SOLAR?

• The earth upper atmosphere receives in average 1,380 W/m² of the full spectrum of solar radiance. At ground level, after the radiation has traversed the atmosphere, the available energy is still around 1,000 W/m² on a clear day. Solar does not cost money.
• The areas in southern Canada, where 90% of the population lives, receive more solar radiation than Germany, which is the world’s leading nation in the use of PV per capita.
• Solar power generation requires no fuel. It makes no noise and produces no emissions with minimal maintenance.
• Costs of solar panels has been declining making solar more viable.
• Can be small enough to power a hot water heater in a house to enough power to power a building or to be sold on the grid.

4.3.2 CHECKLIST FOR SOLAR POWER

• Are there enough hours of light in a year to make the investment pay off?
• Check out the Solar Maps of British Columbia on how much light is in your territory (2 sources listed in references for maps)
• Is there an unobstructed area (from trees and buildings) where you can put the photovoltaic panels-either setting aside enough land for the panels or on rooftops.
• Have to determine is there are no shadows on panels at different times of the year as they cannot absorb energy when shaded by solid objects.
• Over the life of the panels will site remain unobstructed from shadows?
• Did you use an expert installer that can estimate shadows in winter that can be extended for a long ways?
• Determine if you are using solar only for residential use or enough to power your community or if you are looking to add power to the grid
• Did you estimate payback period? Payback can to 10–20 years or sooner if the community is using a diesel generator.

4.3.3 TECHNOLOGY USE FOR SOLAR

A solar system usually uses PV Panels, an Inverter and Storage Batteries that are optional.
4.4 WHAT IS WIND POWER

Wind turbines convert wind energy to electricity. They can sit on top of high towers to take advantage of higher and more constant wind speeds. There are various sizes of wind turbines that can meet a small or large demand for power. When the wind blows and passes the blades, the rotor of the turbine starts rotating (between 10 and 25 turns per minute). The rotor is attached to a shaft that subsequently turns gears and a generator inside the turbine casing. Cables carry the produced electrical current from there down the tower to a substation and onward to transmission lines that then carry it to local homes and businesses.

The power of modern turbines is over 3 MW on land. Wind turbines are designed for wind speeds of between 14 and 90 km/h. Above that, a braking mechanism automatically stops the turbine for the safety of the equipment and to minimize wear and tear. Modern wind turbines supply their nominal power at around 50 km/h.

4.4.1 ADVANTAGES OF WIND POWER

- Advancements in turbine technology have made wind power more competitive. The cost of wind generated electricity has decreased 90% since 1980.
- Wind Power is a clean, reliable source of electricity with no exhaust emissions like greenhouse gases or air pollutants.
- Wind generated power provides a continuous source of clean, green renewable energy with minimal environmental impact.
- Wind energy complements hydro storage projects, allowing water to be stored when the wind is blowing.
- Wind energy projects provide equity ownership, community benefits through property taxes, local employment and tourism.
- Wind energy reduces our reliance on fossil fuel based electricity.

4.4.2 CHECKLIST FOR WIND POWER

- Are there areas in your territory with consistent wind? You should use Traditional Knowledge as well as looking at maps for viable windy areas. Best areas are coastal or lakeside, on a ridge, flat or gently rolling ground, at least 10 metres above any physical wind barriers located within a 100 metre radius.
- If you don't have data on wind, have you installed an anemometer on a meteorological tower that can track wind speeds and direction. Study should be for a minimum of 1 year.
- Is the area for wind close to the grid—or can the cost of transmission lines be added to the project in a way that makes economic sense.
- Has community approved location for wind turbines going up in the area you chose?
- Is site location for turbine consistent with existing land uses?
- Is site in ecologically sensitive areas or a risk to wildlife?
- Could site impact the water supply or affect flood risk?
- Is proposed site known to be sensitive with respect to soil quality?
- Could public response be an issue for site of project?
- Are there any other barriers that may arise for the use of this site?
- Are there existing roads to the site or can you construct roads to site?
4.4.3 STEPS FOR INSTALLATION

- In order to install a turbine at your site you must obtain the appropriate approval from your Local Planning Authority, or Chief and Council, and all regulatory approvals as set out Chapters 9 and 10. You can then proceed to installation stage.
- Construction of access roads for tower and transmission lines
- Preparation and pouring of tower foundations
- Trenching and electrical connection to the grid through your property electrical service
- Assembly of tower
- Installation of wind turbine on your tower
- Installation of your wind turbine control panel
- Erection of the wind turbine and tower
- Initial power up and operation of wind turbine

4.5 OCEAN: WAVE, TIDAL AND THERMAL

Ocean energy converts energy from motion of larger water bodies to electricity. Types of ocean energy include wave, currents and tide and thermal energy. Patterns of waves and tides are well known and so electricity production can be estimated well in advance.

Wave energy is the term used for the energy generated from the power found in waves. It uses the motion of waves to generate energy through a generator. Differential heating of the ocean surface from the sun creates wind, which creates wave and swells. The energy that is available in a wave depends on its length and height.

Tidal energy is the term used to describe the energy generated from power found in ocean tidal currents and the use of tidal height differences. Tidal streams are currents in the ocean water column, created as the water of the ocean rises and falls with the movement of the tides.

Ocean Thermal energy conversion (OTEC) uses the heat energy stored in the earth’s oceans to generate electricity.

4.5.1 ADVANTAGES TO OCEAN ENERGY

- The West Coast of BC has been identified as having some of the best ocean energy potential in the world.
- Patterns of wave and tides are well known so energy production is highly predictable and is relatively persistent.
- Wave energy is most intense in winter months when BC’s energy needs are highest
- Wave energy devices are designed to capture the energy found near the surface of the water and convert it to power.
- Turbines that are used are smaller in size and are out of sight and environmentally benign.
- Reliability and economic feasibility are still being proven.
4.6 BIOENERGY

Biomass energy generation is the creation of heat and/or power from carbonaceous substances such as solid wood or wood residues, which includes woodchips, sawdust, hog fuel and spent pulping liquor; landfill gas methane, municipal and solid waste, industrial wastes and sewage biogas; agricultural crop residues, aquatic plants, animal wastes, and dedicated energy crops such as tree farms such as poplar, willow and switchgrass or miscanthus grass.

4.6.1 ADVANTAGES TO BIOENERGY

- Biomass energy can be stand-alone heat generation such as from the lumber waste associated with sawmills. Conversely it can be stand alone power generation such as Capital Power’s Williams Lake facility. It can also be cogeneration of both heat and electricity such as the configuration at many BC pulp mills. When configured as cogeneration, energy efficiencies often exceed 80%.
- The technologies utilized to create bioenergy include direct combustion, gasification, fast pyrolysis, fermentation and gas collection.
- Biomass technologies are generally considered to be renewable and carbon neutral. This is due to the short processing cycle involved, combined with the regeneration of carbon though replanting, referred to as “biogenic carbon”.

4.6.2 THE TECHNOLOGY

The most common technology used today is conventional boilers in combination with steam turbines to generate electricity. The conventional boiler vaporizes water to make steam, which is then used to produce electricity through a back-pressure, condensing or extraction bine.

4.6.3 CHECKLIST FOR BIOMASS

- Access to enough volumes of biomass feedstocks: Wood, wood products, wood residues including woodchips, sawdust, hog fuel and spent pulping liquor
- Or access to enough volumes of landfill gas methane, municipal solid waste, industrial wastes and sewage biogas
- Or access to enough volumes of short rotation energy crops such as willow, poplar, switchgrass, miscanthus grass
- Or access to enough volumes of Agricultural wastes such as chaff, straw, husks and shells, food processing and manure
- Do you have access to the forest to supply enough cut wood—how long will supply last?
- Would the gathering of the wood/woodwaste be expensive and time consuming?
4.7 STEP 2: CHOOSING THE TYPE OF CLEAN ENERGY AFTER DOING INVENTORY

Once you have completed your inventory of what resources are available in your territory, you need to decide which kind of clean energy you would like to develop based on what kinds of energy are available and if there is sufficient resources. Also take into account any preferences of your members regarding type of energy if it is feasible. You will then do the preliminary assessment to choose the type. You will then go into the pre-feasibility of the project to see if it is economically viable. In choosing the types of energy you would like to develop, you should consider the following:

- Have you made use of members knowledge of the land/water to add to information to choose the right energy type? Knowing where it is continually windy, or levels of water in creeks, or geothermal may be known by members who use the land all the time. Or known to fisherman who use the oceans and are familiar with tides and waves.
- Have you utilized other available information from maps of BC Hydro or other organizations’ maps that show potential for the kind of energy you are looking at?
- What size of project are you looking for? Will you be creating power for commercial use for the grid, or just for the community—this will help in finding the location, size of resource and type of project.
- Have you prioritized the types of energy you want to develop that are within the values of the First Nation?
- Have you established no go zones for projects so you ensure any possible projects are not on or in close proximity to valuable sites of the First Nation (sacred, cultural or gathering?)
- How close is the grid to possible areas to develop?
- If the grid is far away, as part of project feasibility, you will need to figure out the cost of extending the transmission lines?
- Have you selected an engineer that can assess the sites and their viability?
- Have you visited another First Nation’s/other developer’s energy project?
- Note: If you already have a project in mind and do not have to go through this step but it is always good to know what sort of clean energy resources you have within your territory.
Steps in a Clean Energy Project are basically the same for all types of clean energy project. This section will talk generally about pre-feasibility.
Steps in a clean energy project are basically the same for all types of clean energy project. This section will talk generally about pre-feasibility. Specific sections on each type of energy will be in separate chapters. Permitting is set out in Chapters 9 and 10.

5.1 OVERVIEW OF GENERAL FRAMEWORK FOR CLEAN ENERGY PROJECT:

- Cost effective interconnection access
- Meet all environmental laws/regulation/assessments
- Meet technical aspects including all engineering and scientific studies for the project
- Have First Nation consent and social licence in other communities
- Be commercially viable

5.1.1 MEET TECHNICAL ASPECTS THAT INCLUDE:

- Site identification and concept definition
- Project Feasibility
- Preliminary Design
- Detailed Design
- Final Design
- Construction
- Testing/Commissioning
- Monitoring and Maintenance

5.1.2 MEET COMMERCIAL ASPECTS THAT INCLUDE:

- Concept Evaluation
- Feasibility Evaluation
- Preliminary evaluation
- BC Hydro Bid Submission
- EPA Award with BC Hydro
- Financial Close
- Construction Contract Award
- Construction
- Equipment Procurement
- Operation

5.1.3 MEET PERMITTING ASPECTS THAT INCLUDE:

- Application preparation
- Application submission
- Investigations and monitoring
- Development Plan Preparation/Pre-application Submission (EA0)
- Project Authorization
- Construction and Commissioning Approvals
- Approval to Operate
- Monitoring
Once you have chosen what type of clean energy you want to develop you need to:

**5.1.4 ASSESS RESOURCE: SEE ALSO CHAPTER 4**

Assess the resource: is there enough water for a run of the river project (8 or more months of the year), if there is consistent winds, source of fuel for a biomass project, size of geothermal you will be drawing from.

You will need to check out the availability of information like hydrology, wind, and other resources needed for renewable information, or methods of obtaining that information.

If information is not available, you may need to put up a test tower for wind, or place stream gauges in your preferred water system, and other mechanisms to measure size of geothermal or gather information on tides and currently.

**5.1.5 ASSESS POTENTIAL SITE(S)**

- Is site with an area that is acceptable for First Nation that is not in sacred site, cultural or environmentally sensitive area (Check out LUP)
- If a run of river project, can you locate the intake and tail race with least impact to fish—returning water above anadromous salmonid, critical trout or endangered species or resident fish and their habitats.
- Do you need crown lands for the project site, roads and infrastructure such as transmission lines, or industrial activity? If so, need to work with Crown to get approvals. You need to work with the Crown early in prefeasibility process.
  - Province will assess impacts to clean energy project on crown lands.
  - You can work with BC staff to identify impact and develop mitigation techniques. This includes environmental, social impacts to the land, fish and wildlife and other stakeholders
  - Should address concerns before Developmental Plan.
  - Engage any professionals you need to address impacts and mitigation measures.
- If land is privately owned, approach land owners early to gauge interest in a right of way agreement and begin negotiations.
- If First Nation is under First Nations Land Management Act, then the Land Code will identify the development process.
- If First Nation has a Treaty, then need to use treaty provisions or laws under the treaty.
- If under the Indian Act, you need to follow the laws around designation of lands.
5.1.6 INTERCONNECTIONS: GRID ACCESS

Getting your projected connected to the BC Hydro grid is one of the most important elements to your project. Getting in touch with BC Hydro as early as possible in the project development is essential. You may want to ensure that you can connect to the grid before you commence your feasibility studies so you don’t invest time and money on a project that cannot go ahead. Interconnections are done on a first served basis. Due to the technically complex nature of interconnections, the study process can be a lengthy one. But more importantly, it is important to ensure there is sufficient capacity on the distribution/transmission lines and whether an interconnection is technically or economically feasible.

The interconnection process is composed of:
1. Submitting an interconnection request
2. Interconnection Studies: to help BC Hydro understand the impacts to its system and facilities and provide an estimate of the costs associated with any additional equipment or upgrades that may be required prior to signing an agreement. There are many examples of studies on the BC Hydro website.
3. Interconnection agreement
4. Installation of interconnection equipment

5.1.7 KEY FACTORS TO DETERMINE COST OF INTERCONNECTION

1. Size of Project. Size of project does not mean lower costs, it is all about location and other factors.
2. Capacity, type and age of existing grid infrastructure: There are grid infrastructure that may or may not support interconnection. Also, at times, some existing grid infrastructure may be at peak capacity and there is not room left on the line to connect your project. Either of these cases may require substantial upgrades to transmission or distribution infrastructure and have a very large cost implication. Which is why it is important to meet with BC Hydro as early as you can.
3. Location of existing grid infrastructure: If your proposed project is a distance from existing grid infrastructure, this will have a large economic impact on the project in order for you to install transmission lines to connect with the grid. Customers are required to build their system to the BC Hydro grid. Interconnections can be a challenge to interconnect due to performance issues.


5.1.8 ARE YOU CONNECTING TO DISTRIBUTION OR TRANSMISSION LINE?

There are different processes if you are connecting to a distribution or transmission line. See:

Request for Distribution Interconnection (<35 kV)

BC Hydro Distributed Generation Interconnection Practices (distribution-connected projects only)

Transmission Generator Interconnection (>35 kV)
5.1.9 IMPACT OF PROJECT ON RIGHTS, ENVIRONMENT, LAND AND WATER

Understand possible impacts of project on rights, environment, as these will be studies you may want to undertake. You will also need to undertake any studies as required by laws and the government agencies.

5.1.10 PRELIMINARY PROJECT DESIGN

You will need to do a preliminary project design to determine what the project will look at and to determine preliminary soft costs. In your preliminary and final design ensure that you have the engineer plan for natural disasters or severe weather events.

5.1.11 PRELIMINARY COSTS/SOFT COSTS

- If you are working with a business partner that has approached you to do a clean energy project, you can negotiate an agreement that they pay the costs until an IBA is negotiated or other agreed upon timing.
- If you are developing this project on your own you could pay for soft costs on your own, apply to the BC First Nations Clean Energy Business Fund, apply to the AANDC ecoEnergy program, and other funding sources listed below.

5.1.12 RISKS AND RISK PLANNING

Have you done a preliminary assessment on all risks to project?

- Will there be a public outcry for this project or cooperation?
- Are there any risks to the environment that you have to be aware of and plan for or mitigate?
- Are there any financial risks?

5.1.13 REGULATORY PROCESS

Each type of clean energy has a different regulatory process. This will be specifically addressed in Chapters 9 and 10 on permitting and in other chapters for specific types of energy, wind, solar, bioenergy and run of the river.

5.1.14 PROJECT TIMELINES

Timelines should be set for each phase of the project, for applying for permits. Timelines are an important part of project management.

5.1.15 INVESTIGATIVE PHASE APPLICATION

Once you have determined this is a good project to proceed with and done a preliminary analysis, you can move on to the next stage of application preparation.

5.1.16 APPLICATION PREPARATION

Once you have gathered all your information, you need to commence your application with Front Counter BC. See Chapter 8 for all the stages in investigation and application preparations.
5.1.17 CONSTRUCTION AND OPERATION PHASE

1)  Construction:
   - On site monitoring and management including environmental protection, transport to site, training of members prior to construction so they can be hired, community updates—including photos of work in progress
   - Determine who is on management team
   - Making full use of members who have been trained prior to construction
   - Project management plan is a critical element to organize all of the project activities and identifies who will undertake the work and will be organized through a well-defined schedule. This will ensure appropriate resources are organized to bring the plan to life and maximum value to the community.
   - Project commissioning phase

2)  Operations/management
   - Training of members to operate plant and manage issues
   - Putting in place safety plan
   - Safety training for workers
   - Keeping to operational budget, maintaining assets, debt financing schedule.
   - Keeping to any conditions of agreements entered into with bank or other financial institutions, licenses, etc.
   - Updates to community for ongoing operations

5.1.18 CLEAN ENERGY PROJECT INSURANCE

You will need insurance on your project and you need to start early talking to various insurance agencies to find one that understands clean energy projects as well as has the right coverage for your particular project. The various activities for insurance coverage includes such things as procurement, construction, fabrication, loading/unloading, transportation by land, sea or air, pile driving, installation, burying, hook connection and/or tie in operations, testing and commissioning, existence, initial operations and maintenance, project studies, engineering design, project management, testing trial, cable laying, testing and commissioning.
This list is partial and it is best to talk to the professionals to ensure proper coverage. Insurance is costly so you need to have the best package for your particular project.

- **Construction All Risk**: Physical loss of and/or physical damage during the construction phase of a project. This is to cover all risk of physical loss of damage and 3rd party liabilities.
- **Delay in Start Up**: This includes physical loss of and/or physical damage during the construction phase of a project causing a delay to project handover—covers loss of revenue as a result of the delay.
- **Operating All Risks/physical damage**: Sudden and unforeseen physical loss of physical loss or damage to the plant/assets during the operational phase of a project.
- **Machinery Breakdown**: Sudden and accidental mechanical and electrical breakdown necessitating repair or replacement and would include defects in material, design construction or assembly.
- **Business Interruption**: Sudden and unforeseen physical loss or physical damage to the plant/assets during the operational phase of a project causing an interruption. This loss or damage leads to loss of revenue as a result of interruption in business caused by perils under the operating all Risks policy.
- **General 3rd Party Liability**: Liability imposed by law, and/or Express Contractual Liability for bodily injury or Property Damage.
- other?
5.1.19 FINANCING CLEAN ENERGY PROJECTS

Financing a project can be anywhere from $3-$5 million a MW. This of course will vary with time and price of materials and equipment. Finding financing early for all of the types of financing is important for certainty for your project. There are many resources listed in Chapter 19 of where you can apply for various programs. Also, sometimes when you ask around, there are private investors that would like to finance a clean energy project that is close to construction.

Financing a project can consist of 3 different categories or stages:

1. Development costs, also known as soft costs: Money is needed to do the feasibility of the project, checking out project site, fisheries or wildlife studies, preliminary studies. Check out the financing options in the Resource Chapter 19. There are various places that help with development costs such as the BC Clean Energy Business Fund or AANDC Eco Energy. At times when you are doing developing a project, you may need to apply to the different funding bodies listed in the resources chapter and get funds for different parts of the project. It can be time consuming but a lot of the funding is in the form of a grant and does not need to be paid back.

2. Equity Financing: The First Nation will need to come up with their equity for their project. If the First Nation has its own money, it can use that. There are some organizations around that help with equity financing such as the BC First Nations Equity Fund of the BC Regeneration fund. Check out the list in The Resources part of the toolkit under Funding. Bringing in partners that bring in their own equity is also another source of equity.

3. Long term Financing: Getting long term financing for the project can be challenging if you are a First Nation who has not had the experience of building a project before. But if you can prove capacity, and show the financial viability of the project, you should be able to get funding from many different financial institutions. Finding a partner that has the expertise of having built and operated a project helps with finding long term financing.
If you are going to create energy, you need to find a purchaser of your power. In BC, the main purchaser of power is BC Hydro.
If you are going to create energy, you need to find a purchaser of your power. In BC, the main purchaser of power is BC Hydro. BC Hydro enters into Electricity Power Agreements (EPA) with you to purchase your power. This sets out the terms and conditions of how this is done. There are various programs that BC Hydro will purchase Power under and they are Calls for power, Standing Offer Program, Net Metering and proposed Micro Standing Offer Program.

BC Hydro determines how much power BC will need through the development of an Integrated Resource plan. This sets out energy needs for 20 years and is reviewed every 5 years. Right now, in the current IRP, there are no planned calls for power. Therefore, any power they purchase will be based on the programs noted above.

6.1 ELECTRICITY PURCHASE AGREEMENTS (EPA)

a) What is in an EPA? An EPA is an agreement that sets out the terms and conditions by which BC Hydro will buy power from a producer.

b) What terms are negotiable for an EPA: In the SOP, price is not negotiable. In an open call for power, you would bid your price and that is what would be in the EPA.

6.2 STANDING OFFER PROGRAM (SOP): UP TO 15 MW

One of the main sources for supplying Clean Energy to BC Hydro is through the SOP. The SOP has a target energy volume of 150GWh/year — developers are advised to check the BC Hydro website for information on which years are available for a project to reach commercial operation.

Program rules include the following but see full document:

- Project is under 15 MW but greater than .1MW
- Is a clean energy project but must be proven technology
- Project cannot be part of a cluster of projects
- Price for power is set out in EPA
- Can have an EPA from 20 to 40 years
- Commercial Operation Date (COD) must be within 3 years of signing EPA.
- Must have all material permits and demonstrated site control
Standing Offer Program Documents:

Program Rules for SOP

6.3 OPEN CALLS FOR POWER:

There are no scheduled Calls for Power under the Integrated Resource Plan (IRP) for the next 20 years. This can change if BC Hydro changes its IRP and finds a need for power.

Open calls for power is a competitive process where you have to make a bid and may be chosen through a Request for Proposals or Calls for Tender process. Usually based on price of power that you bid. It can also occur if BC Hydro increases its load or deliveries from resources are lower than expected.

6.4 REMOTE COMMUNITY ELECTRIFICATION OF OFF GRID COMMUNITIES (NON-BC HYDRO CUSTOMERS)

Communities that have more than 10 people, are not connected to the Grid and have been in place 5 years or more are considered remote or off grid according to AANDC, Natural Resources Canada and BC Hydro.

These remote communities that are not on the grid and have to rely on diesel fuel which is costly and emits large amounts of Green House Gases (GHG) and diesel has to be transported long distance with the risk of spills. There are risks of spills with storage as well and the dangers of the diesel seeping into the earth and groundwater. These communities are looking for viable sustainable solutions and solutions that can be within the control of the community.

BC Hydro has a Remote Community Electrification (RCE) program that they are not accepting applications for at this time. This is a policy area that needs to be determined with federal and provincial governments. If a community has a proposal you should still approach BC Hydro and AANDC.

6.5 BC HYDRO NON INTEGRATED AREAS (BC HYDRO CUSTOMERS)

Fourteen remote and off-grid service areas are part of BC Hydro’s Non-Integrated Areas. All fourteen of the BC Hydro Service Areas have (regardless of current or potential renewable resource mix) diesel generation for either prime or back-up generation.

Renewable electricity is currently a significant part of the NIA resource mix with five of the larger communities currently operating with hydro based systems. Further additions are limited due to the existing clean energy projects and are considered on a case by case basis.

To date, in order to facilitate renewable projects in NIA, BC Hydro has been working with NIA First Nations on a bilateral basis in order to move through a methodological decision making process on resource assessment and energy requirements. A significant limitation which requires this bilateral process is the technical allowances for renewables. Intermittency, non-load following and unreliability of renewables (except for hydro) make it much more challenging for diesel based micro-grids compared to the integrated grid which has a huge buffering effect.
First Nations in Non-Integrated Areas can continue to work with BC Hydro on a bilateral basis regarding clean energy concepts that they have, to determine at early stages whether there is a viable solution to carry forward.

6.6 SOP APPLICATION PROCESS TO BC HYDRO

- Have you had a pre-application meeting with BC to determine possibility and timing of an EPA?
- Have you had a meeting with BC Hydro regarding timing of interconnection?
- Have you had a meeting with BC Hydro to ensure you understand their application process and what you need in the application?
- Have you submitted a complete application to BC Hydro?
- Have you provided any additional information BC Hydro asked for?
- Have you done your interconnection study and submitted to BC Hydro?
- Have you provided your statement of Project and made any required changes if they were requested.
- If your statement of Project been accepted, then you are ready to sign your EPA with BC Hydro.

6.7 EPA RENEWAL

When your EPA is a couple of years to running out, you need to commence negotiations with BC Hydro. Chapter 8.4.1 of BC Hydro’s Integrated Resource Plan covers this. BC Hydro will look at

1. seller’s opportunity lost
2. electricity spot market
3. loss of service for the seller’s plant
4. attributes of the energy produced
5. other non-energy benefits

Check with other developers who have gone through EPA renewal for insights and advice.

6.8 NET METERING

If you would like to do a small clean energy project of up to 100 kW in a small electricity generation unit on the BC Hydro’s grid, their net metering program is designed for residential and commercial customers that utilize a clean or renewable resource are eligible to participate in the program (usually it is with wind, run of the river or solar.)

- Have you applied to BC Hydro for their net metering program?
- Has BC Hydro assessed your application and approved it?
- Do you have a smart meter as it is now being used to measure inflow and outflow of electricity.
- When you get your application you can install your small clean energy project
- Once installed, have you had an electrical inspector inspect your project?
- Have you submitted inspection report to BC Hydro and had it accepted?
- Once accepted, you can start producing power.
- Have you received a credit to your account? As a net metering customer, when you generate more electricity than you use, you receive a credit to your account that is applied against your future electricity use.
- Check your account on your anniversary date, if you have an excess generation credit remaining on your account, BC Hydro will pay you at the published rate of 9.99 cents per kWh.


### 6.9 MICRO STANDING OFFER PROGRAM (SOP)

- Program is in development
- Check in with BC Hydro website for updates on program launch
- For projects in the range of 100kW to 1 MW.
- Will be a simple, streamlined process
- Have simplified form of SOP, EPA or contract
- Be used for existing infrastructure such as water or wastewater treatment facilities, waste heat and energy from industrial processes to produce small amount of electricity. It can also support on-farm digestors and solar projects.

*Tla-o-qui-aht First Nation run of river project on Vancouver Island.*
6.10 SALES TO OTHER UTILITIES/INDUSTRIES

- Selling power to the US requires both Canadian and US approvals for both importing and exporting power and for use of transmission services.
- Can sell power to Fortis BC and other utilities that may buy power.
- Can also sell power to industrial power consumers directly.
- You can also sell power to power Marketers such as Powerex (BC Hydro’s marketing agent).
- Selling power to a buyer may be subject to the BC Utilities Commission (BCUC) if you fall into the definition of “public utility” under the Utilities Commission Act.
- You can use BC Hydro’s transmission lines by paying a wheeling fee. There must be capacity on the lines to do so.
In order to do a clean energy project you will need to build many relationships.
In order to do a clean energy project you will need to build relationships with the following groups:

- With all levels of government as needed (local, provincial and federal,) identify who relationships are important with and how it will be done. This includes people who do the permitting and project leads.
- With surrounding communities
- With potential companies that may provide services you will need for things like construction, equipment, expertise, etc.
- With companies you may want to go into partnership with
- Other

7.1 WHAT ARE ELEMENTS FOR A GOOD PARTNER YOU WANT TO DO BUSINESS WITH:

- Recognizes rights and title of First Nation
- Willing to work with First Nations on protecting and minimizing impacts to rights
- Willing to agree to higher environmental standards in project
- Respect of First Nation, its history, struggles and realities, rights, way of life and territory
- Is working with First Nation because it makes good business sense or because they have to.
- Recognition of what First Nation brings to project: Cannot value
- Certainty and easier approvals with governments
- Strength of relationships with Governments—valuable government contacts
- Strength of community relations/local governments relations
- Local investment—First Nations—not all company with no ties to community
- Positive publicity for partnering with First Nations: makes a good news story
- Participate with First Nation in any cultural ceremonies, celebrations they want to have with respect to the project – asking permission to use water or land, prayers and blessings, cleansings, thank you events
- Observe any cultural protocols that may be necessary during project
- Willing to Learn about First Nations culture and protocols from First Nations or have already learned
- Is this a strategic partnership—partner brings revenue, relationships, expertise, etc.

Once you decide you like a company you should do your due diligence.

- Check out what kind of reputation they have in the industry they are working in, in the communities they have other projects, check them out generally
- Check their financial situation—especially if they are bringing money to the project. If a publicly traded company check their financial statements and annual reports.
- Check with government officials who work with them if they follow through on requirements for licensing
- Ask other First Nations where they have done projects or are in partnership with.
- Check out key people in the company
- If they meet your requirements, you may want to do an MOU on how you will begin to work together.
7.2 CONSULTATION WITH FIRST NATIONS, LOCAL GOVERNMENTS AND OTHER ORGANIZATIONS.

- Do you have a First Nation in the project area that claims territory that is in an overlap or shared area? Shared areas are when agreements are in place and overlaps are where there is no agreement on boundaries.
- You will need to consult with First Nations who claim territory in the project area—meet and establish a process for consultation
- Meet with local governments regarding project and determine if there are any concerns
- Address any concerns First Nations and local governments have
- Provide information to the public, organizations, environmental groups so they are aware of your project and address any concerns they may have
- Provide information early, keep people well informed so you have their support and won’t be opposing your project.
- A strong strength of claim document is extremely helpful.
- Utilize the expertise of First Nations who have built a project.

7.3 DIFFERENT KINDS OF AGREEMENTS

When you are building a relationship with a possible partner/proponent, there are various kinds of agreements that may be used. You do not need to use all these agreements depending on how you want to develop the relationship.

a. Relationship Agreement: agree to work together to see if the First Nation wants to be part of the project. Can have exclusivity provisions that the company cannot seek other partners until a decision is made on whether the parties will enter into business together. Can have other types of agreements like a Participation Agreement as mentioned in section 7.1.

b. One of the first agreements you negotiate should be for funding capacity.

c. Confidentiality Agreement: This can be in the relationship agreement or a stand-alone agreement that sets out a process on how confidential material will be handled.

d. Land Use Agreement if using reserve lands

e. Partnership agreement sets out the terms of what each partner will bring to business, their rights and responsibilities.

f. Shareholder Agreement: sets out the rights and responsibilities of shareholders.

g. Impact Benefit Agreements (IBA)

7.3.1 WHAT ARE IBA’S FOR?

- To set terms for how a company can do business in First Nation’s territory
- Can include anything that is important to the First Nation including protecting areas, setting environmental standards, doing business together and any monetary terms.
- There are no set terms on what can and should be in an IBA—just what First Nation thinks is important.
- If First Nation does not want a project to go ahead, an IBA should not be negotiated as this will signal to government that you are ok with project.
- You may decide you do not want the project to proceed because you cannot agree to the terms of an IBA.
7.3.2 PREPARING FOR IBA NEGOTIATIONS

- Establish a structure for negotiations and a negotiating team with specific skills and capacities to support successful negotiations
- Develop a plan for gathering and managing information and ensure FN gets info in a timely fashion
- Develop a budget and consider precursor agreements
- Gather information about the project context, commodity and company
- Establish baseline conditions about the community’s socio economic and cultural environment and know what community wants to protect and gain from it.
- Determine how and when to share information with the company and community and how this information is shared with the community
- Establish community processes
- Assess bargaining position
- Determine objectives and develop a strong negotiating position.
- A lot of technical information and terms on the development will be used—make sure you have the technical expertise you need on your team
- Insist that Schedules, time lines have to be within First Nation decision making processes

7.3.3 NEGOTIATIONS COMMITTEE

- Define roles for negotiations committee
- Create rules for negotiations that can guide team
- Form negotiation agenda/mandates based on community goals, aspirations and priorities
- Agree on negotiations tactics and strategies
- Document all negotiations, conversations and verbal agreements
- Pay attention to what happens between meetings
- Focus on relationship building with company in the community
- Craft legal provisions using right expertise
- Identify options on all substantive provisions that will be needed to meet community goals and protect community interests
- Agree on substantive provisions that obtain the maximum benefits for the community and minimize any costs it must bear
- Ensure there is broadly based community support for a draft agreement—if there isn’t, return to negotiations table
- Ratify agreement by process determined by membership
7.3.4 SUBSTANTIVE ISSUES THAT COULD BE COVERED IN AN IBA

- First Nations issues must be the priority and and they must be addressed.
- Templates are a good guide, but solutions/mechanisms must be crafted with the First Nation objectives and needs being addressed.
- Doesn’t matter what size the development company is, benefits can be negotiated in all areas of financial benefits, employment and training, business, environment and other areas.
- Be strategic in covering the issues—what are the possible limits on outcomes? What does community want to achieve in the area? What are priority issues for community?
- Consider implementation processes.
- What will be communication between the parties.
- First Nation and public access to development area.
- Potential socio economic impacts.
- Impacts During Advanced Exploration/investigation (if applicable).
- Impacts During Construction.
- Impacts During Operations/Reclamation.
- Revenues to First Nation which can include milestone payment, royalties or equity participation which can be granted or purchased.
- Construction: employment targets, hiring preferences, procurement, direct awards.
- Education and Training: Retention, employment policy, career advancement—management opportunities, workplace environment, living arrangements, financial support.
- Union relationships.
- Ensure that training takes place before construction and operations so members will be prepared to take on jobs.
- Agreement could include a provision that will support he company in hiring and remaining First Nation members, either have a company paid community-liaison or an HR Committee, comprised of both company and First Nation personnel. Another possibility is to have aboriginal recruiters as part of the staff—recruiters would be most effective if from the First Nation.
- First Nation to provide cross cultural training to any workers that are not from the First Nations.
- Business Development.
- First Nation Liaison.
- Determining what happens to First Nations rights/benefits if project is sold. Ensure the agreement will be assigned to new owner.
- Conflict resolution.

7.3.5 ENVIRONMENTAL MANAGEMENT ISSUE FOR IBA

- Permits and licenses—how does First Nation give approval.
- Research on environmental issues: First Nation consent on TOR for studies, who does studies, review and approval—determination if more study needed.
- Monitoring and management systems: Role of First Nation.
- Set standards.
- Mitigation measures.
- Toxic material and substances—how handles.
- Culture and heritage: process.
- Harvest and traditional use assessment: how accomplished.
7.3.6 COMPENSATION

☐ May be unavoidable that development interferes with hunting, fishing, trapping, gathering—how will this be addressed? How can it be mitigated? Trust fund for trappers? Annual payments to elders? Supplements to trappers, hunting trips and provision of meat to elders?

☐ Finance new hunting/trapper cabins, communication, transportation, habitat enhancement, equipment repair, alternatives?

7.3.7 POSSIBLE SCHEDULES TO IBA

(could be in body of agreement but if extensive terms use schedules or appendixes.)

☐ Implementation Committee
☐ Company-Community Liaison
☐ Agreement Coordinator
☐ Training and Education Opportunities
☐ Employment opportunities
☐ Business and contracting opportunities
☐ Abandonment and reclamation
☐ Community benefit fund

7.3.8 COMMUNITY PROCESS FOR RATIFICATION OF IBA

☐ Ensure there are clear community processes to work with community in obtaining issues for negotiations

☐ When reports are made to community

☐ When input from community is needed

☐ Specify how community ratifies agreement: meeting? Voting—polls? By leadership?

Who votes? Notice to members regardless of residency
7.3.9 IMPLEMENTATION OF THE IBA

☐ Establish clear goals for implementation of the agreement
☐ Build strong institutional structures for implementation, based on culturally appropriate models.
☐ Develop implementation plans and review them often
☐ Define who is responsible for implementing different parts of agreement
☐ Negotiate resources for implementation of agreement including funds to access expertise or information resources
☐ Anticipate staffing, program and policy needs and start to build capacity for them.
☐ Build in incentives and penalties to motivate action
☐ Develop a system to monitor implementation
☐ Build in an easy to use system for amending parts of the agreement that are most likely to be affecting by changing circumstances.
☐ Anticipate external factors that can influence implementation success and have a plan on how to deal with them
☐ Use agreement to build a strong relationship
☐ Involve the company in local activities in order to build relationship and trust
☐ When something in the IBA does not work, the agreement can be re-opened at any time to make changes. If the IBA is not achieving what is set out to do, then it should be changed.

*Note: the size of the business and the complexity of the development determines how much of the elements of the IBA you will need to work with. Pick and choose what you think works for you.

7.4 REVENUE SHARING WITH BRITISH COLUMBIA

- Clean Energy Revenue Sharing has been determined by Regulations. 37.5% of revenues from new incremental water and land rentals from a project will be revenue shared with First Nations.
- What is not clear and would be negotiable would be how that 37.5% would be shared with First Nations in the area and how the impact of the project on each First Nation would be determined.
When a First Nation is contemplating a Clean Energy Project there are several ways that you can get involved. From being a 100% owner of a project or any other share the First Nation can negotiate. For those First Nations who do not want to take any risks, there are resource royalty sharing agreements.
8.1 WHAT ROLE DOES FIRST NATION PLAN TO HAVE IN CLEAN ENERGY PROJECT?

When a First Nation is contemplating getting involved in a Clean Energy Project there are several ways that you can benefit, from being 100% owner of a project to any other share the First Nation can negotiate. For those First Nations who do not want to take any risks, there is the opportunity to negotiate a resource royalty sharing agreement. Resource royalties are negotiable with companies and you can enhance these rates. Other benefits like jobs and training are covered in the IBA section in Chapter 7.

8.1.1 OWNERS, LEAD PROJECT DEVELOPMENT, BRING IN PARTNERS AS NEEDED

The First Nation can do the project themselves and own 100% of project. This means the First Nation can choose the kind of clean energy project, choose the location of the project and lead the development. If the First Nation needs equity partners, or partners with expertise, partners can be brought in according to the values the First Nations set.

8.1.2 EQUITY OWNERS

If your First Nation is being approached by a clean energy developer to do a project within your territory, you may want to own part of the project. This is all subject to negotiation with the developer. As an equity owner, you will be required to bring equity into the project. How you provide that equity will be up to you to negotiate.

- Some First Nations have negotiated some or all of their equity as part of their consent to the project.
- A First Nation may bring a water license, or land on their reserve to the table and that could be part of the equity share.
- The Equity share may start off as a smaller share the First Nation can currently afford, and then double or triple over a period of time. Increasing the First Nation’s share can be done by the First Nation paying in more equity and or using their dividends along the way to pay for that equity.
- Other First Nations have negotiated up to 100% ownership at the end of the payout of the loan for the entire project or up the end of the EPA term.
- Be innovative in coming to your ownership in the project.
- understand differences between preferred and common shares
- understand projects’ financial model

Negotiations are key and being conscious of what you bring to the table as an economic benefit will be important to how you negotiate your ownership in the project. You may want to obtain the services of an experienced negotiator if you do not have that capacity in house.

8.1.3 RESOURCE ROYALTY SHARING

Some First Nations will not want to take on any risk or benefits in the project. Some First Nations may be able to negotiate royalties on top of their dividends paid for their ownership. Determining a fair share of royalties is a matter of negotiations. Understanding the financial statements to determine how much profit the project will make is important for these negotiations. The project has to be able to make money for the developer and their investors with a reasonable rate of return to be viable for them and ensuring your royalty payment is fair is all part of the balancing.
8.2 FINANCIAL VIABILITY OF THE PROJECT

When you are trying to determine if your project is economically viable you will need to do financial projections. Below are financial projects for a 25 MW project and for a 5 year project. A 25 year model will show you the long term projections of your project, but the model should be for as long as the term of your EPA.

Examples: These examples are for illustration only and calculated at certain time spots. They are to show you an example of the kind of revenues and costs that you will need to look into. It is a guide only.

1. Determine Cost of Project 15 MW

<table>
<thead>
<tr>
<th><strong>GENERIC POWER PROJECT CAPITAL COST ESTIMATE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Installed 15 MW</strong></td>
</tr>
</tbody>
</table>

- Cost per MW Hard and Soft project cost (before Financing) $3,000,000
- Construction Cost $45,000,000
- Financing Contingency Required (10%) $4,500,000
- Financing Fee/Lender’s legals (1%) $450,000
- DSRA—4 months $1,400,000

*Construction Period assumes 24 equal payments*

- Interest During Construction $3,746,400
- Total Capital RQD $55,096,400
- Loan Rate 6.00%
- Debt % 80%
- Debt Amortization 25 years
- Monthly Debt Payment $283,989.50
- Equity % 20%
- Debt Proceeds required $44,077,120
- Equity Proceeds required $11,019,280
2. Generic Power Project Operating Cost Assumptions

<table>
<thead>
<tr>
<th>Cost Description</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations &amp; Maintenance cost estimate per Installed MW</td>
<td>$10,000</td>
</tr>
<tr>
<td>Water Rental Charge Estimate per MWh</td>
<td>2</td>
</tr>
<tr>
<td>Property Tax Estimate per Installed MW</td>
<td>$20,000</td>
</tr>
<tr>
<td>Insurance Estimate Per installed MW</td>
<td>$7,000</td>
</tr>
<tr>
<td>Lender Requirement for maintenance reserve per installed MW</td>
<td>$5,000</td>
</tr>
<tr>
<td>Administrative Cost &amp; Regular Maintenance estimate</td>
<td>$65,000</td>
</tr>
<tr>
<td>2010 Standing Offer Pricing</td>
<td>90.33 (average)</td>
</tr>
<tr>
<td></td>
<td>103.67 (2010)</td>
</tr>
</tbody>
</table>

*Note: There have been different prices for different regions—It is BC Hydro’s intent to have one price across the board and intends to make this change to the SOP program this fall.*

3. Revenues: Based on the power sales revenues you will receive based on the production level of energy and the price you will receive

<table>
<thead>
<tr>
<th>Forecasted Inflow/Revenues</th>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
<th>YEAR 4</th>
<th>YEAR 5 TO 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forecasted Sales Revenue</td>
<td>5,558,179</td>
<td>5,613,761</td>
<td>5,669,898</td>
<td>5,726,597</td>
<td>5,783,863</td>
</tr>
<tr>
<td>Green Credits</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>ecoEnergy Credits</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>
4. Forecasted Outflows/Expenses: You need to figure out what your expenses will be.

<table>
<thead>
<tr>
<th></th>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
<th>YEAR 4</th>
<th>YEAR 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insurance estimate for property value</td>
<td>105,000</td>
<td>107,100</td>
<td>109,242</td>
<td>111,427</td>
<td>113,655</td>
</tr>
<tr>
<td>Water rentals estimate</td>
<td>97,762</td>
<td>99,717</td>
<td>101,711</td>
<td>103,745</td>
<td>105,820</td>
</tr>
<tr>
<td>Property and school tax estimate</td>
<td>300,000</td>
<td>306,000</td>
<td>312,120</td>
<td>318,363</td>
<td>324,730</td>
</tr>
<tr>
<td>Land Lease and Royalty Costs 2%</td>
<td>111,164</td>
<td>112,275</td>
<td>113,398</td>
<td>114,532</td>
<td>115,677</td>
</tr>
<tr>
<td>Operations (wages) and estimates</td>
<td>150,000</td>
<td>153,000</td>
<td>156,060</td>
<td>159,181</td>
<td>162,365</td>
</tr>
<tr>
<td>Major Maintenance reserve required under financing</td>
<td>75,000</td>
<td>76,500</td>
<td>78,030</td>
<td>79,591</td>
<td>81,182</td>
</tr>
<tr>
<td>Professional fees Auditor, lender’s engineer</td>
<td>40,000</td>
<td>40,800</td>
<td>41,616</td>
<td>42,448</td>
<td>43,297</td>
</tr>
<tr>
<td><strong>Total Expenses/ Maintenance Reserve Contribution</strong></td>
<td><strong>878,925</strong></td>
<td><strong>895,392</strong></td>
<td><strong>912,177</strong></td>
<td><strong>929,287</strong></td>
<td><strong>946,727</strong></td>
</tr>
<tr>
<td>Net (one year construction assumed)</td>
<td>1.37</td>
<td>1.38</td>
<td>1.4</td>
<td>1.41</td>
<td>1.43</td>
</tr>
<tr>
<td>Return on Equity 10.67%</td>
<td>1,271,380</td>
<td>1,310,495</td>
<td>1,349</td>
<td>1,349,847</td>
<td>1,429,262</td>
</tr>
<tr>
<td>Leverage 80%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015 Power Price $103.67</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacity Factor 40%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Period Inflation assumption 2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating period PPA Price Escalation 50% 1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NO CASH FLOW TO EQUITY DURING CONSTRUCTION**

Once you have done your projections, you can determine if your project is economically viable with a reasonable Return on Investment.

A second model for a smaller scale Run of River project is shown on the next page.
TYPICAL RIVER HYDRO PROJECTS

PRELIMINARY FINANCIAL ANALYSIS FOR POWER SALES

BASIC PARAMETERS

POWER PRODUCTION DETAILS

- Hydro Power Plant Rated Ca: 5,000 kW
- Max Power Supplied to BCH: 5,000 kW
- Power Plant Load Factor: 40.0%
- Avg Annual Generation: 2,000 kW
- Net Annual Power Sales (Outtages not Included): 17,520 GWh/yr

CAPITAL COST

- Access Roads: 400,000
- Intake structure: 1,600,000
- Penstock: 3,700,000
- Powerhouse Structural: 1,700,000
- Generation Equipment: 2,500,000
- Powerhouse Ancillaries: 100,000
- Transmission Line: 800,000
- Construction — Other: 100,000
- Project Engineering: 763,000
- Project Management: 400,000
- Consultants: 250,000
- General Expenses/Permitting: 800,000
- Financial including Insurance: 800,000
- Contingencies: 1,887,000

Total Capital Cost in 2007 $: $15,000,000
Cost per Installed kW: 3,000

LONG TERM PROJECT VALUE

- Hydro Plant Design Life: 40 Years
- Depreciation Rate: 2.5% per Year
- Annual Book Depreciation: $375,000
### ANNUAL OPERATING COSTS

**Annual Daily Administration, Operation & Maintenance, Overhaul & Equipment Repair**  
1.50%

**First Year Total O & M Cost (incl. admin)**  
$225,000

**O & M Inflation Rate**  
2.5%

**Administration and Insurance**

**Property Value for Insurance Purposes**

- 100% of Capital Cost  
  $15,000,000
- Property Insurance  
  1.60 $/1000
- General Liability  
  $3,000,000
- Liability Insurance  
  6.00 $/1000
- First Year Admin and Insurance  
  $42,000

**Admin & Insurance Inflation Rate**  
2.5%

**Water Rent**

- Water Tax on Energy Produced  
  1.288 $/MWh
- Water Tax on Installed Capacity  
  4.291 $/kW
- First Year Water Rent  
  $44,021

**Water Rent Inflation Rate**  
2.5%

**Property and School Taxes**

**Assessed Property Value**

- 45% of Capital Cost less Equip  
  $3,960,000
- School Tax  
  14.200 $/1000
- Municipal & Property Tax  
  4.490 $/1000
- Miscellaneous Asset Tax  
  0.000 $/1000
- First Year Tax Assessment  
  $74,012

**Tax Inflation Rate**  
2.5%

**5-year school tax refund**  
19,869

### FINANCING DETAILS

**Total Capital Cost**  
$15,000,000

**Equity Input**  
30.0%

**Equity Amount**  
$4,500,000

**Finance Amount**  
$10,500,000

**Amortization Period**  
25 Years

**Reference Interest Rate**  
4.00% Prime Rate

**Interest Rate over Refer.**  
2.50%

**Effective Interest Rate**  
6.50%

**Annual Payment**  
$860,806

### REVENUE DETAILS

**Energy Payment**

- 2010 Energy Price  
  10.225 cents/KWh
- 2016 Energy Price (base)  
  11.858 cents/KWh

**CPI for 2010 and 2016**  
2.50%

**Revenue adjustment**  
1.000

### WHEELING PAYMENTS

**Wheeling Payment Percentage**  
0.0%

**Initial Wheeling Payment Rate**  
0.000 cents/kWh

**Initial Wheeling Payment Amount**  
0

**Property Purchase Payment**  
0

**Internal Rate of Return**  
20.63%

**Debt Service Coverage in Year 1**  
1.97
Installation of Tla-o-qui-aht run of river project.
This section is a general approach to project development. Later chapters will address specifics for Wind, Run of the River, Solar and Ocean Energy. This is meant only as a guide. Working with the government agencies in ensuring all stages are being done correctly is important. At times the steps will overlap—there is no clear formula on the step by step process.
9.1 STAGE 1: EVALUATE PROJECT’S VIABILITY

There are three requirements to meet in a project evaluation

1. Technical: all engineering and scientific studies for project—i.e. site identification, project feasibility, preliminary design, detailed design, final design, construction, testing/commissioning, monitoring and maintenance
2. Commercial: all evaluations to demonstrate the viability for the project to potential investor as well as a bid preparation and commercial contracts for project construction i.e.: concept evaluation, feasibility evaluation, preliminary evaluation, BC Hydro Bid Submission
3. Permitting: will be done through the development of the project

Tips for getting through project review:

☐ Make sure you follow provincial guidelines (provincial fish guidelines, clean energy guidebook and Development Plan Information Requirements)
☐ Do due diligence on finding resource professionals that have experience and credibility. Ensure you developed relationships with them so you fully understand one another.
☐ Ensure any information packages are signed by qualified resource professionals
☐ Makes sure all guidelines are current by speaking with project lead (these can be changed from time to time)
☐ Work closely with project lead and keep them informed of progress or delays or any issues that may arise.
☐ Work with First Nations, stakeholders and other tenure holders. Let them know about project before government sends out letters. Provide information and answer questions and address concerns. Create support for project.
☐ If you have a larger project that needs to go through an Environmental Assessment process make sure project lead is aware so this can be collaboratively.

CHECKLIST FOR STAGE 1

Prepare an investigative phase application—includes:

☐ Prepare a Crown land tenure application (if Crown land involved)
☐ Prepare an Investigative Plan (includes project overview, description, maps, and an investigative schedule for water power, wind power and ocean power)—applications for water, wind and ocean are available at www.frontcounterbc.gov.bc.ca
☐ For water project—may include water license application.
☐ Have you evaluated the project’s viability including the technical, commercial and permitting aspects?
☐ Have you considered potential environmental, social, archaeological and permitting aspects of the project?
☐ Have you asked FrontCounterBC any questions you may have in process?
☐ Have you met with a Clean Energy project lead to discuss the project review process and any permitting questions you may have?

Once you have completed going through the checklist for Stage one, you will know whether your project is viable and whether you should proceed.
9.2 STAGE 2: COMPLETE INVESTIGATIVE APPLICATION TO FRONTCOUNTERBC

CHECKLIST FOR STEP 2

☐ Have you filled out the application checklist to make sure you have met all the criteria before you submit it? (checklist available once you have signed into FrontCounterBC and created an account)
☐ Have you submitted your complete application package to FrontCounterBC?
☐ FrontCounterBC will receive and complete a preliminary status report and will note any issues or conflicts
☐ FrontCounterBC will notify federal and provincial regulatory agencies, third parties and First Nations in the areas that the application has been received.
☐ You will be notified who the project lead is from FLNRO—this person will be in charge of reviewing application process
☐ Any requests for more information from First Nations or government agencies will be forwarded to you through the project lead.
☐ If you decide to make changes to your application after you submitted it, contact your project lead

9.3 STAGE 3: DETERMINE PROJECT’S FEASIBILITY

At this stage is when you gather data required to determine project feasibility, and begin preliminary designs. You will also need a Land Act Investigative License of Occupation so you can be authorized to do your initial investigation on Crown land and to do any feasibility studies.

☐ Have you submitted your Investigative Plan?
☐ Has Land Officer provided authorization for your plan?
☐ Have you commenced and concluded feasibility assessments?
☐ Have you done any baseline studies on critical regulatory and financial issues?
☐ Have you developed preliminary design for basis of cost estimates from contractors to prepare for bid?
☐ Have you done a feasibility evaluation to estimate revenues?
☐ Have you done a Preliminary evaluation to calculate revenues and costs based on the preliminary estimate that includes estimates based on site specific costs?
☐ Have you developed a proposal to supply electricity under contract for a specific prices based on revenue and cost estimates?
☐ Have you reviewed the Clean Energy Development Plan Information Requirements (DPIR)?
☐ Have you met with provincial agencies to discuss any questions you have with DPIR and/or project lead to ensure you have a DPIR that meets all the requirements?
9.4 STAGE 4: ADVANCING THE DPIR

The Development plan must identify, assess and address all impacts and contain all information in sufficient detail for regulatory agencies to assess project. The Development Plan must show how the project will meet legislative requirements and address any concerns raised during the project view. It must be complete with no unanswered questions and be in the format in the guideline.

☐ Has your investigation ensured there are enough Crown Lands and other resources needed for the project? If so, contact project lead and tell them you are moving to draft DPIR.
☐ Has project lead told you when you can submit application for General Areas License of Occupation application for Crown Land?
☐ Working with consultants/professionals to input into DPIR
☐ When finished the draft DPIR, forward it to project lead
☐ DPIR will be reviewed by crown agencies to check for deficiencies and any consultations with First Nations will need to commence
☐ Have you received confirmation from project lead that the DPIR has been endorsed by Review Team? If so you can commence studies
☐ Before commencing studies you will need to meet with BC Hydro, DFO, local governments, stakeholder and the public on the DPIR.
☐ If there were requested changes from the consultations, have you made the changes requested and provided to project lead?
☐ Continue work under DPIR until completed.

9.5 STAGE 5: SUBMITTING DPIR

☐ Has your Development Plan been submitted with all required information? If the project lead has asked for further information have you provided it?
☐ A completeness Review of a Development Plan is 30 days.
☐ After the completeness review, then the technical review will occur. A technical review includes review by technical staff, First Nations and stakeholders based on the environmental and social impacts and reviews any mitigation or compensatory plans.

9.6 STAGE 6: PROCESS DURING THE TECHNICAL REVIEW OF DEVELOPMENT PLAN

☐ Project review team will go through Development Plan
☐ Consultation Coordinator will provide finalized Development Plan to any First Nations and will let project lead who will let you know if there are any issues raised
☐ Address any requests from review team to add further preventative, mitigation or compensatory plan or provide supplementary information and detail.
☐ After addressing concern, submit a report on how concerns raised are addressed.
☐ You may need to have an open house at request of review team
☐ You will get primary project authorizations once the information in the Development Plan is accepted.
9.7 STAGE 7: PROJECT AUTHORIZATIONS

- Once you have gotten through the project review, a decision package is prepared by project lead.
- Decisions will be around things like Crown land tenure, water license for hydro projects. May also include License to Cut, authorization to use existing roads or to construct new ones.
- Other secondary authorizations can occur after this point including during construction and commission phases. Work with project lead on timing so there are no delays.

9.8 STAGE 8: CHECKLIST OF PERMITTING AND REVIEWS

- For Hydro projects, have you appointed an Independent Engineer if it was required? And an independent Environmental Monitor.
- Have you developed and submitted to the province for review work plans for the independent Engineer and Environmental Monitor if it has been required?
- Have you ensured that any condition in an Environmental Assessment Certificate?
- Have you prepared and submitted an Operational Environmental Management plan? The Operational Environmental Management Plan is a long term plan for monitoring following commissioning. Final plan needs to be approved during this step.
- Have you applied for all construction level permits and submitted to the Province for decision?
- Are you living up to all commitments made during the project review?

9.9 STEP 9: OPERATIONS AND MONITORING

- Independent environmental monitor is not required during operation.
- Project is interconnected to the grid for commercial testing and operation.
- An Operation Environmental Management plan must be submitted annually.
- All commitment must be kept up
- 5 years prior to end of license either apply for an extension of license or prepare for decommissioning.
- If decommissioning, must clean up and remediate.
Tsouke crews installing solar panels. (Photo: Tsouke First Nation)
CHAPTER 10
PERMITTING

An overview of Provincial and Federal Permitting for Clean Energy Projects
## 10.1 Overview of Provincial and Federal Permitting for Clean Energy Projects

### Provincial Permitting

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single window of service for authorization and permits for clean energy projects</td>
<td>Front Counter BC Single window service to help people with natural resource authorizations and permits—makes sure applications are complete.</td>
</tr>
<tr>
<td>Single window of service for Natural Resource Sector Major Projects within the clean energy sector</td>
<td>Major projects range in scope, scale and complexity but they have significant capital investment and involve multiple and complex government authorizations.</td>
</tr>
<tr>
<td>Environmental Assessment</td>
<td>Environmental Assessment Process kicks in for:</td>
</tr>
<tr>
<td>If a project is reviewable under CEAA—it will typically require a BC EA. Then a harmonized process will be done.</td>
<td>Power Plants</td>
</tr>
<tr>
<td>If BC EA not required, proponent can ask for it and to harmonize.</td>
<td>1. With capacity &gt; 50 MW that is a hydroelectric power plant, a thermal electric power plant, or another power plant.</td>
</tr>
<tr>
<td></td>
<td>Modification of an existing facility that results in the facility having a capacity that has increased by more than 50 MW of electricity.</td>
</tr>
<tr>
<td></td>
<td>Transmission Lines:</td>
</tr>
<tr>
<td></td>
<td>1. New electric transmission line of &gt;500 kV and &gt;40 km in length on a new right of way.</td>
</tr>
<tr>
<td></td>
<td>2. Modification, extension or replacement of a facility with a voltage of &gt;500 kV or higher and 40+ kms or longer; or addition of a transmission line within the right of way occupied by the existing facility.</td>
</tr>
<tr>
<td>Land Authorizations and Permits (Crown land tenure)</td>
<td>Contact Land Tenures Branch early in the pre-application process to ensure you can get land you need for project.</td>
</tr>
<tr>
<td>Forest, Range, Road Authorizations and Permits/Tenures</td>
<td>Will need approval to cut, damage, destroy and remove Crown Timber whether it is for Roads, constructing project works and installing infrastructure.</td>
</tr>
<tr>
<td></td>
<td>For guidance on this, there is direction for Requirements for Planning, design and construction to Protect Forest Roads and Timber Tenures.</td>
</tr>
<tr>
<td>Topic</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Archaeology Assessment</td>
<td>Permits required under Heritage Conservation act to alter a heritage site or object.</td>
</tr>
<tr>
<td>Water Management and Licensing</td>
<td>Water licenses are needed for power production, water storage and industrial or commercial use. Regional operations issues water licensing and approvals for short term use or change in or about a stream (in stream work.) More about water licensing in Run of River section.</td>
</tr>
<tr>
<td>Road and Highway Permits</td>
<td>You will need permits for temporary or permanent to use, impact, or connect to highways, secondary roads or public rights of way. This includes permits for power lines.</td>
</tr>
</tbody>
</table>
BC Clean Energy Act  
BC Hydro’s Integrated Resource Plan—  
Chapter 8 on Clean Energy |
| Parks and Protected Areas               | If there is any proposed works in Parks, permits must be obtained. |
## FEDERAL PERMITTING

<table>
<thead>
<tr>
<th>Regulation of Air Safety (Transport Canada)</th>
<th>For Wind Power Projects or projects that use lighting or marking of structures such as antennas, towers, cable crossings and building</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulation of Navigable Waters</td>
<td>Clean energy projects may affect transportation systems in the air and on the water—wind tower, equipment for tidal or wave power/weirs/dams, bridge crossings. Transport Canada’s Navigation Protection Program will review projects to determine if approvals are needed.</td>
</tr>
<tr>
<td>Federal Environmental Assessment:</td>
<td>Will apply to project if it falls in definition of the Regulations Designating Physical Activities. The Minister can also designate a project to fall under the Act. CEAA will apply if building a project or transmission line in a wildlife area of a migratory bird sanctuary. Fossil fuel generating project &gt;200 MW. In stream tidal generating project over 50 MW. A new hydroelectric facility &gt;200 MW. Any expansion of projects to &gt; 50 MW for tidal and &gt;200 for fossil fuel or hydroelectric dams. See regulations for more on size of reservoir and diversion. Different types of assessment - screening - comprehensive study - mediation - Review Panel.</td>
</tr>
<tr>
<td>Fisheries Act</td>
<td>Need DFO to authorize any work or undertaking that will result in harm alteration, disruption or destruction (HADD) of fish habitat. DFO also ensures Species at Risk Act (SARA) and CEAA 2012 terms are met. Doing any work in water, within 30 meters of water or that may affect water quality or quantity. If doing wave, tidal or hydrokinetic generation you will need to work with DFO.</td>
</tr>
</tbody>
</table>
10.2 PERMITTING GENERALLY

- Will be different for each kind of Clean Energy
- Must be aware of all the permits required for project
- Refer to guide books and key contacts within the BC Provincial government.
- Important to liaise with Front Counter BC and MFLNRO
- Depending on location (off reserve) for MSOP and net metering you may need local government approvals. As this will differ with every area, you may want to check into this.
- For good project management, having a timeline for permitting is essential. Timelines can be changed if permitting takes longer than anticipated.
- Ask other First Nations for help in permitting.
- CleanEnergyBC also has an operations committee that works on permitting issues.
- Permitting must be done properly so you don’t have to be delayed and redo it or add to what has been done.
- Permitting is more than filling out forms and paying a fee.
- Develop relationships with people who do the permitting. It makes it easier to get your permits when you can ask questions freely.

Chief Patrick Michell of Kanaka Bar First Nation, Kwoiek Creek Run of the River Project. (Photo: Innergex)
Saik’uz First Nation Members and Innergex personnel visiting the Carleton Wind Farm in the Gaspe’ Peninsula, December 2014. (Photo: Saik’uz First Nation)
Common issues with Wind Farms to watch for, manage and plan for.
11.1 COMMON ISSUES TO WATCH FOR WITH WIND FARMS TO MANAGE AND PLAN FOR

1. Mortality of resident and especially migratory birds and bats from striking transmission lines directly. Marbled Murrelets is a major concern if you are on the coast and if you are in the interior Sandhill Cranes and rare bats are examples of species of concern.

2. Where you site the wind farm and transmission lines and access roads—if you are in sensitive ecosystems or ungulate winter ranges or wildlife habitat areas.

3. Sound impacts to nearby residences: See the following websites for assistance: Best Practice for Wind Power Project Acoustic Assessment BC 2012: http://www2.gov.bc.ca/gov/content/industry/natural-resource-use/land-use/crown-land/crown-land-uses/clean-energy/wind-power
   
   Land Procedure—Acoustic Assessments for Wind Power Projects: http://www2.gov.bc.ca/gov/content/industry/natural-resource-use/land-use/crown-land/crown-land-uses/clean-energy/wind-power

4. Clearing of vegetation during the bird nesting season.

5. Habitat loss and fragmentation of wildlife habitat, especially for red/blue and SARA listed wildlife.

6. Disturbance of wildlife from construction activities (e.g., blasting during eagle/heron nesting season leading to nest abandonment).

7. Destruction of red/blue and SARA listed plant species and plant associations.

8. Increased access by public to wilderness areas, potentially resulting in increased hunting/poaching activity, and disturbance to wildlife.

9. Increased access leading to perturbations to sensitive ecosystems (especially bogs) and increased sediment and erosion from off-road use of 4 X 4s, ATVs and dirt bikes.

10. Loss of riparian vegetation and fish habitat from construction of stream crossing for access roads and transmission lines. Work with DFO and projects near water.

11. Potential changes to hydrologic regime when building wind farms and associated roads on sheet bogs.

12. Potential exposure of metal leaching and acid rock drainage.

13. Visual impacts to nearby parks and protected areas. Various construction impacts such as fuel spills.
11.2 STEPS IN DEVELOPMENT

11.2.1 EARLY CONSULTATIONS

1. If there are any First Nations who assert title in the area you wish to site your wind farm, you will need to do Consultations or follow any agreed upon process if you have an agreement with them.

2. If you are in the area of a city or local government, you should consult early and as often as possible so you can identify any objections early on. Keep them informed through planning, development and operations phases. Builds Community support this way.

11.2.2 WIND ASSESSMENT

As mentioned earlier, you need to know how much wind, speed of the wind and other climatic conditions. You use this data to estimate how much energy a wind farm can produce over one year and if it is economically viable.

11.2.3 DESIGNING THE WIND FARM

You must use your wind data and topographical information to design your wind farm. See references for wind farm ranges in Chapter 19-I (ii).

1. Use engineers to model wind flow, turbine performance, sound levels and other parameters to optimize where you put your wind turbines.
2. Engineers also design access roads, turbine foundation and local electrical network and connection to the grid.

11.2.4 ENVIRONMENTAL STUDIES

You may need to do some of all of the following environmental studies depending on what the particular issues are in your territory and what is required under permitting:

1. Environmental assess to identify and mitigate potential impacts on community residents, landscape, plants and wildlife, soil and water, land use or other activities such as aviation and telecommunications.
11.2.5 PERMITTING

You may require permits under the following Acts:

- Is your project near water? May require Fisheries and Oceans Canada approvals.
- Does your project have any impacts to migratory birds and their habitat? You must propose measures to mitigate adverse effects during construction, operation and decommission: Process under the Migratory Bird Convention Act and Regulations
- Navigation Protection Program/Transport Canada—is your project putting towers in navigable waters? Installing measuring devices, bridges along access roads and cable or transmission line crossing? May need to go through Navigation Protection Program and it may trigger a CEAA 2012.
- Air Safety: if your project has lighting or marking of structures such as antennas, towers, cable crossings and building you have to meet standards for air safety. Apply for Aeronautical Obstruction Clearance Form.
- For operations, Licence of Occupation for Intensive Use areas, for roads and for transmission line. Either a Licence of Occupation or ROW and for a Substation need a Crown Grant.
- S.9 Water Act for Notification or Approval for changes in or about a stream—e.g. Roads, bridges or s.8 Short term water use.
- Forest Act, Forest Practices Code Act and Forest and Range Practices Act: Occupant licence to Cut or Free Use Permit for investigative area, Occupant licence to cut for project footprint, 3rd party Road Use Agreement, Works permit, Special Use Permit for road access.
- Wildlife Act: Wildlife Sundry permits e.g. Required to capture and/or collect specimens for scientific and other non-recreational purposes
- Heritage Conservation Act: Inspection/Investigative Site Alteration, Alteration permit
- BC Transportation Act: Access or Utility Permits within Highway ROW
- Miscellaneous Permits: Food Premise Permit, Refuse Permit, Fuel Storage Permit, Effluent Discharge Permit, Air Discharge Permit, Mineral Reserve Permit—to prevent mining claims in or near a project
- If you are in EA, need EA certificate and required federal permits

11.2.6 LAND ACQUISITIONS

If Crown land, need to negotiate a crown land lease with the Province. If reserve land, follow processes in Indian Act/regulations, if First Nations has a Land Code under the First Nations Land Management Act, use that, or if a treaty, the treaty and its laws will apply. If private land, negotiate a lease with landowner.
11.2.7 ECONOMIC AND FINANCIAL ANALYSIS

Developers demonstrate the economic viability of their project to raise the funds necessary to build a wind farm. They work to estimate the cost of turbines and their installation, as well as the costs of access roads, electrical systems, operations and maintenance. This is balanced with an analysis of the potential income received from the energy production of the wind farm over the lifetime of the project.

11.2.8 SELECTING TURBINE

Wind turbine component parts are manufactured and pre-assembled at the factory, then shipped to the wind farm site where the final assembly takes place. You need to choose what size/kind of turbine you want, where you want to purchase it from and order it in enough time to have it installed on your time schedule for COD.

11.2.9 SITE PREPARATION AND CONSTRUCTION

Work crews prepare turbine sites by building access roads, preparing turbine foundations and reassembling turbine components. A crane is used to erect turbine towers and install the nacelles and rotors with their hubs and blades. This phase presents the best opportunities for local business and jobs. Other activities related to logistics, travel, lodging and material supply generate significant additional local revenue.

11.2.10 COMMISSIONING

During the final development phase, the electrical collection network is installed and connected to the grid through the substation. Final testing is completed before the wind farm becomes fully operational.

11.2.11 OPERATIONS AND MAINTENANCE

Activities that are performed on a regular basis throughout the project's life include monitoring and analyzing performance, conducting environmental surveys and performing preventive maintenance and repairs on the turbines and other components of the facility. In addition to the permanent employment created to perform these tasks, a region with several wind farms may develop and deliver new training programs for the specialized workers needed for these jobs.

11.3 RISKS OF PROJECTS

- Long lead times and up front costs (e.g. Planning, permitting and construction costs)
- Critical component failures (gear training/box, bearings, blades etc.)
- Wind resource variability
- Off shore cable laying (if applicable)
Ocean Energy projects have begun to appear as demonstration or pilot initiatives. Ocean energy is any energy that harnesses tides, currents and waves.
12.1 ISSUES OF CONCERN

- Species at Risk e.g. Orcas—mitigate concerns on risk of collision, halibut avoidance and sound levels and other fish species
- Impacts of technology used on environment

12.2 PERMITTING

- DFO: Projects near water; follow DFO’s multi step process to evaluate your project for potentially harmful impacts to fish and fish habitat.
- If impacts cannot be mitigated, need to have authorized Harmful Alteration, Disruption of Destruction of fish habitat (HADD). Have to prove you have a sound plan to create fish habitat elsewhere.
- Navigation Protection Program (NPA) of Transport Canada. Things like subsurface cable, floating or seafloor mounted turbines directly within navigable water. Or other infrastructure on land that could potentially affect navigation.
- There is a list of Scheduled Waters and if your project is within that list you will need NPA approval. Must make application.
- Requirement for an approval under NPA triggers an Environmental Assessment (CEAA 2012)
- BC Land Act: Investigative License of Occupation: if you need to check out Crown Land you may want to use. For tenure: Need General Area License of Occupation of If you need land for work camp: License of Occupation
- Land Act for operations, License of Occupation for Intensive or Extensive Use areas, for roads and for transmission line. either a License of Occupation or ROW.
- Forest Act, Forest Practices Code Act and Forest and Range Practices Act: Occupant License to Cut or Free Use Permit for investigative area, Occupant license to cut for project footprint, 3rd party Road Use Agreement, Works permit, Special Use Permit for road access.
- Wildlife Act: Wildlife Sundry permits e.g. Required for capture and/or collect specimens for scientific and other non recreational purposes
- Heritage Conservation Act: Inspection/Investigative Site Alteration, Alteration permit
- BC Transportation Act: Access or Utility Permits within Highway ROW
- Miscellaneous Permits: Food Premise Permit, Refuse Permit, Fuel Storage Permit, Effluent Discharge Permit, Air Discharge Permit, Mineral Reserve permit—to prevent mining claims in or near a project
- If you are in EA, need EA certificate and required federal permits

12.3 IDENTIFYING KEY RISKS

- Survivability in harsh marine environments (moorings systems, etc.)
- Various designs and concepts—still being tested
- Prototypical/technology risks
- Small scale and long lead times

12.4 TIDAL ENERGY COMMUNITY ENGAGEMENT HANDBOOK

For further guidance on developing a tidal energy project see: Tidal Energy Community Engagement Handbook
CHAPTER 13
RUN OF RIVER PROJECTS
13.1 WATER LICENSING

The most important thing in a run of river/waterpower project is a water license that will be issued under the Water Act until 2016 when the Water Sustainability Act will come into force.

Water Act deals with water licensing, diversion, use and storage of water, also changes (work and activities) in and around stream. All needs approval. Water rights are first in time, first in right. Water for run of river is consumptive and that is taken into consideration in water flows.

13.1.1 STEP 1: WATER ACT LICENSE APPLICATION

Must Apply for Water License

- Water license is tied to land: Do you have land appurtenant to the water—need to be owner of land or substantial interest in the land to be used for the project (Acquiring tenure under Land Title Act such as General Area License of Occupation) Or if reserve land—appropriate authorizations under Indian Act, First Nations Land Management Act or Treaty/law under treaty.
- Need an Investigative License application. This is sufficient for Crown land tenure to apply for a water license.
- In order to get water license have to identify and address impacts on third parties, public safety, protection of environment and other water users including aboriginal rights and title.
- Water licenses are issued for 40 years—not the same as EPA.
- Annual water rental fees are based on reported energy production and installed and under-construction capacities.
- Most ROR projects do not use storage, but if you do, you need a storage purpose Water License.
- If your project has a headpond area or reservoir, you will need a License of Occupation under the Land Act. If there is stored water then you need a permit over Crown Land. The Permit over Crown Land is part of the project water license.
- You need to have appropriate data for Instream Flow Data Collection. There are guidelines you can follow.
- See also Assessment Methods for Aquatic Habitat and Instream Characteristics in support of Application to Dam, Divert or Extract Water from Streams in BC
- Data Collection includes describing and assessing the hydrology, geomorphology, and biology in the waters and how your project will affect it. You will also need to describe other land and water uses in the areas and how they will work with your project.
- Must engage an Independent Engineer (IE) who will review and make recommendations to the Water Act engineer or Regional Water Manager with respect to design and construction of works in water License and in issuing a Leave to Commence Construction and a Leave to Commence Operations.
- Must engage an independent Environmental Monitor (IEM) who will provide information and reports on construction activities that are in the Construction Environmental Management and Protection Plans. IEM has delegated authority from Water Act to stop work. If needed, they will work with IE to address any concerns.
• Must put in place the Operating Parameters and Procedures Report. This is a life of the project plan for describing the facility, operating procedures and monitoring and reporting requirement like instream flow requirements and ramping. This is a document that is continually revised and changed as details of the operations are refined. This report will also outline reporting requirements to the government.

13.1.2 OTHER WATER ACT LICENSES

• A temporary License is needed for Worker’s Camp if you have a camp
• Need Section 9 Approval or notification for Changes in or about a stream. Application is required for changes in and about a stream for such things as stream crossings for road access.
• Section 8 Approval for diverting water during construction for short term use—Application

13.1.3 WORKING WITH FEDERAL AGENCIES

13.1.3 (a) Fisheries and Oceans Canada (DFO)

DFO will be involved in your project if the footprint impacts on fisheries during construction, installation and operation. This could include obstructing fish passage, entrainment of fish at intake causing mortality, cause a HADD, insufficient flows for protection of fish or sudden flow changes causing stranding.

• Use the Self Assessment tool to determine if DFO should review your project
• If you determine you need a DFO review, fill in the application form and submit.
• Must ensure you have sufficient flows to provide for fish and fish habitat within the diversion reach.
• Locate the intake and tail race with least impact to fish—returning water above anadromous salmonid, critical trout or endangered species of resident fish and their habitats.
• Must ensure there is no sudden stoppage or surge in water flows within the diversion’s reach or downstream of the tailrace during start up or emergency shutdown.
• Must ensure there is no fish entrainment. Fish screens or other engineered devices must be part of project.
• DFO’s Project Notification and Review Application form should be completed for all waterpower projects. Do this as early as possible to involve DFO in application process. Application process should include any of DFO’s requirements.

13.1.3 (b) Navigation Protection Program/Transport Canada

• Must use the Navigation Protection Program to review your project to see if it needs approval under the Navigable Protection Act. Determines the potential to affect navigation on waterways through placement of project components or through changes to water flow along diversion reaches that are in navigable waters. This review is required for any works placed on, over, under, through or across navigable waters that is on the list of Scheduled Waters and is done by application.
13.1.4 OTHER PROVINCIAL AUTHORIZATIONS FOR RUN OF RIVER

13.1.4 (a) Land Act

- Are you wanting to use Crown Land for part of your project? Need to apply for such a license. Need an investigative license to do appraisals, inspections, surveys, field studies, analysis, etc. Have to agree to public access to the area without interference. License lasts 5 years and can be for an area up to 5000 ha. $500 a year annual rental.
- If you are using Crown Land for footprint, need a Multi Tenure Instrument called General Area License of Occupation (GALOO) Footprint can include powerhouse, penstock, intake, etc. or temporary construction areas such as laydown and spoil areas. Can be given for the broad area and finalized once construction is complete to the specific area needed.
- If powerhouse is on Crown Land, need a Lease or Crown Grant. Need legal survey. Long term tenure with exclusive rights. Tenures will be for the same terms as the water license. For a crown grant, land priced at the appraised land value based on comparable industrial markets.
- Does your project need to put in transmission lines? Will also need a Statutory ROW.
- Will also need a statutory ROW for penstock or tunnel and headpond if using Crown Lands.
- A license of Occupation or Lease will be needed for intake structure (including headpond) if using Crown Land
- A license of occupation will be needed for roadways and bridges leading to the project site.

13.1.4 (b) Forest Act Authorizations:

Free Use Permit: Need it to cut and remove less than 50 m3 of merchantable timber

Works Permit: If your project needs to carry out works within a Forest Service Road right of way to install penstocks, transmission lines or other project related activities.

Third Party Road Use Agreement: When you need to use a road in a situation where an industrial user already has road permit for a non service road.

License to cut; Remove timber from project footprint

Road Use Permit: To use a road where there is already a primary road user—must enter into maintenance agreement with them. Road Use Permit allows holder to use a Forest Service

13.1.4 (c) Forest Practices Code:

Permit to cross fish stream for crossing structures
13.1.4(d) Transportation Act Authorizations

- Access Permit: Is needed to construct any roads that originate off any roads maintained by Ministry of Transportation
- Utility Permit: Needed if you are constructing or maintain power lines within existing MOT highway right of way.

13.1.5 OTHER PERMITS

If you are doing a large project where you need a camp, you may need A Food Premises Permit, Refuse Permit, Fuel Storage Registration, Effluent Discharge Permit, Air Discharge Permit.

Mineral Reserve Tenure: If you want to prevent any mining claims from being staked in or near your project, you can apply for Mineral Reserve Tenure

13.1.6 IDENTIFY AND PLANNING FOR RISKS

- Flooding (for those extreme weather events—could be covered in design)
- Seasonal/annual resource variability
- Prolonged breakdowns due to offsite monitoring (long response time) and lack of spare parts

Risk Management Consideration: Use of long-term proven technology with low operation risks and maintenance expenses
Environmental and economic benefits when creating biomass/bioenergy can include reducing carbon footprint, improving forest utilization, diversifying forest industry, creating new jobs, increasing rural development and enhancing regional growth and competitiveness.
14.1 SOURCES OF BIOMASS

Do you have access to a steady supply of fibre for operations?

- From existing by products from wood processing facilities
- Private sources
- Waste from existing logging operations
- Access to standing timer
- Pine Beetle Stands
- Roadside accumulations of fibre not usable for lumber

14.2 STEP 1: FUEL SUPPLY IDENTIFIED

- Demonstrate fuel supply by source or agreements with facilities
- Consult with FLNRO on supply sources
- Determine economic viability for biomass proposal before submitting proposal

14.3 STEP 2: APPLICATION, SUBMISSION AND ACKNOWLEDGEMENT

- Submit application to FrontCounterBC
- Applications includes fuel supply sources, locations and amounts. If using standing timber, identify locations, volumes, species and negotiate licence agreements to move Crown timber from forests

14.4 STEP 3: DEVELOPMENT PLAN PREPARATION

- Work with Federal and provincial agencies to refine project plans, mitigate impacts, determine forest tenure and finalize Development Plan
- If a licence, must comply with Provincial Standards for harvesting, road construction, etc.

14.5 STEP 4: COMPLETION AND SUBMISSION OF DEVELOPMENT PLAN

- Development plan outlines sources and required levels of fuel.
- Agreements have been finalized to access fuel supply
- Have a long term licensing agreement
- Mitigation of forest resources must have approval of FNLR0 staff

14.6 STEP 5: LONG TERM FOREST TENURES

- Long term forest tenure agreements are finalized

14.7 STEP 6: IDENTIFY RISKS

- Fuel supply availability/variability
- Resource price variability
- Environmental Liabilities associated with fuel handling and storage.
CHAPTER 15
CAPACITY BUILDING

Planning for Capacity Building for Clean Energy Projects for Chief and Council, members, and board positions.
15.1 CHIEF AND COUNCIL

- If needed, provide negotiations training for chief and council or staff, whoever will be doing negotiations for the First Nation.
- Provide training for Project Management from project feasibility to development of the project. Could hire a project manager and have a member train with the Manager to get experience.
- Have a human resource database in place that sets out the skills, education, and experience of all adult members. This sets out strengths and gaps in knowledge and skills, where you need people trained.
- Ensure you have members trained to operate and maintain the project. Could include the following qualified people:
  
  - **Technical Positions**: Plant Operators, Technologists, Engineers, and environmental Technologists;
  - **Electricity-Related Trades**: Line Workers, Electricians, Welders, Technicians, and Technologists;
  - **Operational Positions**: Building Maintenance and Telecommunications;
  - **Communications and Management Roles**: Related to activities such as community consultations/liaison.
  - **Planning & Regulatory Functions**: Long term—planning for the companies’ operations workforce;
  - **Capital Programs & Construction**: Renewal of major capital programs and generating/transmission infrastructure;

Provide training that can take place in the community, on-line, community colleges, or other institutions of learning. Partnerships with university and other institutions can take place to deliver specific training in the community.

15.2 COMMUNITY MEMBERS

- Community Members: provide basic training on the kinds of clean energy, the specific type of clean energy.
- Apply for funding to do training and develop a training plan for future jobs.
- Community Members: Provide basic training on corporate structures and their role as members/shareholders, reading of financial statements, etc.
- Willing members sent to courses that are already in place to be qualified for a job. Work closely with members to see that they are willing to leave the community to be trained is very important.

15.3 BOARD MEMBERS

- Board members: Assess members in the community. Do you have enough qualified members to be on the board of Directors?
- What sort of training do members need? Set up board training as needed.
- Board members could be a First Nations Development Corporation or be board members on company that operates project.
It is always a good idea to have a public relations/media strategy in place before your project is completed. Key stories could be made out of the approval of the project, progress during construction, completion and celebration of the project.
16.1 NEED FOR A MEDIA STRATEGY

It is always a good idea to have a public relations/media strategy in place before your project is completed. Key stories could be made out of the approval of the project, progress during construction, completion and celebration of the project.

Getting your company/First Nation out into the public eye opens doors to other projects, potential business partners and more clean energy projects. For example, thanking the government for their contributions through the Clean Energy Business Fund helps to put pressure on them to keep putting more money into the fund to develop more projects and increase the opportunity for more projects.

Be prepared with Press Releases, or do short video clips for your website and on You Tube. Getting the governments, businesses and other organizations familiar with your First Nation names brings many benefits.

16.2 CHECKLIST

A communications plan should have an internal strategy for dealing within the First Nations community. It should also have an external strategy for dealing with outside the First Nation community.

☐ Does your First Nation or Development Corporation have a media/communication Strategy?
☐ If not, develop a communication strategy for your clean energy project or add specifics relating to your clean energy project to your existing strategy.
☐ Develop key messages you would like to use to promote project e.g. Benefits to First Nation and surrounding area, keys to effective partnerships (business/financial), feature members in training and then on the job.
☐ Make it into a good news story—best practices.
Clean Energy Projects are legally intensive. Choosing an experienced engineer is vital to the success of your project.
17.1 LEGAL ISSUES

Clean Energy Projects are legally intensive so it is important that you choose a lawyer that:

- knows the clean energy business and understands the terms needed in power purchase agreements, loan agreements, guarantees and warranties, and IBAs.
- Knows EPAs and other BC Hydro instruments
- Consultation requirements for First Nations who assert territory where your project is located.
- Understands corporate structures that allow for the least or no taxation of dividends transferred to the First Nation

17.1.1 CHECKLIST FOR CHOOSING A LAWYER FOR SOME OR ALL OF THE FOLLOWING (THIS LIST IS NOT EXHAUSTIVE.)

- Review of BC Hydro Agreements: Even if there is not much that is negotiable in an Electricity Purchase Agreement (EPA), it is important that you understand all your obligations and liabilities that come with this agreement. Ensure you have that legal advice before you sign. Especially understand any financial penalties if the project cannot go ahead for any reason.
- Review of Turbine/windmills, other equipment contracts especially if you are bringing them in from the US or other country.
- Negotiations of Loan agreement: Review and Negotiating loan agreements for equity or capital review is critical to a successful project
- Right of Way Agreements: Negotiating and getting the best terms possible.
- Review of other Agreements for contractors, local governments, etc.
- Incorporation of Companies: Advice is needed on which is the best structure for taking advantage of tax exemptions. Currently having a General partner and a limited partnership allows for no tax to be paid by First Nation.
- Shareholder agreements, trust agreements
- Non disclosure agreements, MOU’s to work together, IBA’s,

17.2 CHOOSING AN ENGINEER:

Choosing an experienced engineer is vital to the success of your project. The engineer will do the preliminary design and final design and oversee the construction of the project to ensure everything is built correctly. If you are the majority owner in a project, this will be something you will do with agreement of your partners. If you a minority owner, you still will have a say in choosing an engineer.

Do your due diligence when choosing an engineer. Check out their reputation, their working relationship with First Nations and the quality of their projects. You need someone with a proven track record of success. Here is a list of engineering firms that are known to do work in Clean Energy, there could be more so don’t consider this a complete list. Ask around for names as well.

i. Barkley Project Group Ltd, hydro, studies and designs [www.barkley.ca](http://www.barkley.ca)
ii. EBA Engineering, all types of energy and studies [www.eba.ca](http://www.eba.ca)
iii. Hemmera, all types of energy and studies [www.hemmera.com](http://www.hemmera.com)
iv. Innergex, all types of energy, studies, design [http://www.innergex.com](http://www.innergex.com)
v. Kerr Wood Liedel, all energy types studies and designs [www.kwl.bc.ca](http://www.kwl.bc.ca)
vi. Klohn Crippen Berger, hydro, studies, design [www.klohnc.com](http://www.klohnc.com)
ii. Knight Piesold, hydro, wind, studies design [www.knightpiesold.com](http://www.knightpiesold.com)
iii. Levelton Engineering, all energy types, studies, design [www.levelton.com](http://www.levelton.com)
ix. Mcelhanney Enginnering, hydro, studies [www.mcelhanney.com](http://www.mcelhanney.com)
x. PGL Environmental Consultants all types, studies [www.pggroup.com](http://www.pggroup.com)
xi. Powertech labs inc, studies design [www.powertechlabs.com](http://www.powertechlabs.com)
xii. Sigma Engineering, hydro, studies, design [www.synex.com](http://www.synex.com)
CHAPTER 18
TERMS AND ACRONYMS

A guide to the many terms and acronyms for clean energy.
B.C. FIRST NATIONS CLEAN ENERGY TOOLKIT

a. **AANDC**: Aboriginal Affairs and Northern Development Canada  
b. **AIA**: Archaeological Impact Assessment  
c. **BCEAA**: BC Environmental Assessment Act  
d. **CEAA**: Canadian Environmental Assessment Act 2012  
e. **CEBC**: Clean Energy BC  
f. **CEI**: Clean Energy Initiative  
g. **CEP**: Clean Energy Project  
h. **COD**: Commercial Operations Date  
i. **DFO**: Department of Fisheries and Oceans  
j. **DP**: Development Plan  
k. **DPIR**: Development Plan Information Requirements  
l. **EA**: Environmental Assessment  
m. **EPA**: Electricity Purchase Agreement  
n. **FLNRO**: Ministry of Forests, Land and Natural Resources Operations  
o. **FN**: First Nations  
p. **FNCEWG**: First Nations Clean Energy Working Group: First Nations in BC who are working together to pursue greater opportunities in developing clean energy, provide a lobby group to work with the BC Government and BC Hydro and other initiatives that will advance clean energy for First Nations.  
q. **FNEMC**: First Nations Energy and Mining Council  
r. **IRP**: Integrated Resource Plan  
s. **MEM**: Ministry of Energy and Mines  
t. **MoE**: Ministry of Environment  
u. **PPA**: Power Purchase Agreement  
v. **ROW**: Right of Way  
w. **SOP-Standing Offer Program**: BC Hydro’s call for power under 15MW of power and can be applied for any time during the year. Limitation is BC Hydro only produces 45MW a year in total under this program  
x. **WL**: Water License:  
y. **Units of Power:**  

1 kilowatt (kW) = 1000 Watts  
1 Megawatts (MW) = 1000 kilowatts  
1 Gigawatt (GW) = 1000 MW

z. **Units of Energy**  

1 kWh = 1000 watts for 1 hour  
1 MWh = 1000 kWh  
1 GWh = 1000 MWh

1 MWh is approximately 1/10 of the electricity consumed by an average BC household over a 1 year period.

1 kV = 1000 Volts
So many questions to answer!
For more in-depth information, these additional resources can help answer your questions.
A) OTHER TOOLKITS

i) Clean Energy Production in BC: An Interagency Guidebook for Project Development

ii) BC Hydro Self Assessment Toolkit


iv) Green Energy Outlook: Generating Opportunities for Aboriginal Communities by Aboriginal Human Resource Council

v) FNEMC Workbook for Short Course for Generate 2012


vii) Powering our Province: An analysis of the Clean Energy Business and Workforce Opportunities for Communities in BC by Globe Advisors

viii) Coast Opportunities Bulletin #1 First Nations Renewable Energy Roadmap

ix) Tidal Energy Community Engagement Handbook

x) Community Handbook to Mine Water Geothermal Heating and Cooling

B) FUNDING


ii) Guidelines for BC Clean Energy Business Fund
http://www2.gov.bc.ca/gov/DownloadAsset?assetId=0FC2480B438E4F89BAC8FCE4BE3238A&filename=guide_first_nations_clean_energy_business.pdf


iii) First Nations Regeneration Fund: Equity Fund
http://ecotrust.ca/project/first-nations-regeneration-fund/

iv) First Nations Equity Fund: Administered by NEDC, ANTCO and NRT
http://www.nedc.info contact Ron Arcos

v) CorpFinance Inc. www.corpfinance.ca

vi) ecoENERGY for Aboriginal and Northern Communities Program
vii) Natural Resources Canada usually has funding programs. The one listed has already given out all their money but you can check back to see if new programs or more money has been put into the Fund for Renewable Energy and Clean Energy Systems Demonstration projects. [Link](https://www.nrcan.gc.ca/energy/funding/current-funding-programs/cef/4953)

viii) AANDC Community Economic Opportunities Program [Link](https://www.aadnc-aandc.gc.ca/eng/1100100034258/1100100034259)

ix) EcoAction Community Funding Program [Link](http://www.ec.gc.ca/ecoaction/default.asp?lang=En&n=FA475FEB-1)

x) Green Municipal Fund if you have a project with a local government [Link](http://www.fcm.ca/home/programs/green-municipal-fund.htm)

xi) For Research and Development funds try [Link](http://www.cra-arc.gc.ca/txcrdt/sred-rsde/menu-eng.html)

xii) For Bioenergy projects see [Link](http://bcbioenergy.ca/contact/submit-eoi/)

xiii) Western Diversification Programs—check for submission deadlines [Link](http://www.wd.gc.ca/eng/301.asp)

xiv) Coast Opportunity Funds for member nations only [Link](http://www.coastfunds.ca/first-nations-economic-development-funds)

xv) Vancity under their Environmental Sustainability up to $15,000 [Link](https://www.vancity.com/AboutVancity/InvestingInCommunities/Grants/CommunityProjectGrants/ProgramGuidelinesAndCriteria/)

xvi) Aboriginal Capital Corporations

  - All Nations Trust Company (ANTCO): [Link](http://www.antco.bc.ca/)
  - Burns Lake Native Capital Corporation: [Link](http://www.blndc.ca/)
  - CFDC of Central Interior First Nations: [Link](http://www.cfdcofcifn.com/)
  - Nuu-chah-nulth Economic Development Corporation (NEDC): [Link](http://www.nedc.info/)
  - Sto:lo Community Futures: [Link](http://www.stolocf.com/)
  - Tale’awtxw Aboriginal Capital Corporation: [Link](http://www.tacc.ca/)
  - Tribal Resource Investment Corp: [Link](http://www.tricorp.ca/)

xvii) Cape Fund: [Link](http://www.capefund.ca/en.html)

xviii) First Nations Finance Authority [Link](http://fnfa.ca/en/)

xix) First Nations Infrastructure Fund [Link](http://www.aadnc-aandc.gc.ca/eng/1100100010656/1100100010657)

C) FIRST NATIONS WITH CLEAN ENERGY PROJECTS
**D) BC LAWS**

### BIOENERGY

**Gitanyow First Nation**  
Gitanyow is working on a 4.5 MW bioenergy project – under development

### RUN OF RIVER

**Douglas First Nation**  
Involved in the following Projects:
- Douglas Creek
- Tipella Creek
- Fire Creek
- Stokke Creek
- Stave River
- Upper Stave
- Lemont Creek
- Trethawey Creek
- Big Silver River

Partner: Innergex  
Lawyers: Callison and Hanna  
Contact person: Chief Don Harris

Open to First Nations touring projects.

Has revenue sharing agreement with BC.  
Has Participation Agreement with Innergex.  
May be able to share some information—discuss with Chief.

**Ehattesaht**  
Partnership with Synex Energy 80%, Ehattesaht 20%  
After 35 years, Ehattesaht to own majority share.  
4.6 MW of power  
Barr Creek  
Zeballos Hydro Limited Partnership  
2% Ehattesaht  
23 MW
## RUN OF RIVER (continued)

<table>
<thead>
<tr>
<th>First Nation/Partnership</th>
<th>Project Details</th>
</tr>
</thead>
</table>
| Hupacasath First Nation (72.5% owner) and Ucluelet First Nation (10% owner) | China Creek—Upnit Power Ltd.  
6.5 MW  
In operation since 2005  
Attention: Rick Hewson  
Hupacasath 72.5%, Ucluelet 10%, Synex Energy 12.5% and City of Port Alberni 5%  
Lawyer: Jean Yuen, Boughton & Co  
Environmental Consultant: Ecofish  
Engineer: Sigma Engineering |
| Kanaka Bar Indian Band | Kwoiek Creek  
Partnership: Kanaka Indian Barr 50%, Innergex 50%  
50 MW  
In operation since 2014  
Attention: Patrick Michell patrickmichell@hotmail.com |
| Namgis First Nation | Kokish River  
Partnership with Brookfield  
45 MW |
| Shishahl | Willing to share information with other First Nations.  
Shíshálh and NI Holdings projects include three IPP projects on Chickwat and Ramona Creeks in Narrows Inlet, totaling 33 mw.  
Sechelt Creek 16 MW—Regional Power |
| Tahltan Central Council | McLymont Creek 55–70 MW Project and Volcano Creek 15–18 MW project  
Have Impact Benefit Agreements (IBAs) for both projects that includes revenue sharing, ownership and other benefits.  
Partner: AltaGas for the projects.  
Forest Kerr 195 MW Project  
Has IBA for revenue sharing, ownership and other benefits.  
Partner: AltaGas |
RUN OF RIVER (continued)

Sts’ailes

Sts’ailes holds IBA’s on the following creeks/rivers with EPA’s; all are Run of River located in the Harrison Watershed located in Sts’ailes Traditional Territory:

- Sakwi Creek 5.4 MW – WindRiver Power Sts’ailes ownership & royalty — Operating
- Tipella Creek 18 MW — royalty — Operating Partner: Innergex
- Stokke Creek 24 MW – royalty — Operating
- Trethawey Creek 21 MW – Sts’ailes ownership & royalty — Partner: Innergex — Under construction
- Big Silver River 41 MW – Sts’ailes ownership & royalty — Partner: Innergex — Under construction
- Trio Creek 25 MW – Sts’ailes ownership — Partner BT Hydro Corporation — Under construction
- Bremner Creek 25MW – Sts’ailes ownership — Partner BT Hydro Corporation — awaiting environmental assessment certificate

Statlu Creek
Shovel Creek

Contact: Robert Lagasse, CEO Sts’ailes Dev Corp
Has Royalty Sharing agreement with BC

Legal Counsel: Miller Titerle LP
Engineers: various; HiMark Forest Consultants Hemmera; Sasquatch Forest Products LP (archaeology; forestry; fisheries)
Consultant: Headwater Capital

Partners:
- Bremner Trio Hydro Corporation
- Innergex Renewable Energy Inc
- WindRiver Power Corporation

Open to have First Nation tours of facilities and can share information with consent of partners

Negotiated IBA’s have led SDC to negotiate contracts for both existing businesses and new JV’s. Parallel business opportunities in the Energy Sector include. Remote Camp Services; Construction: Site Development (road building/right of way clearing for penstock tx line/power house site); Construction: Concrete Formworks; Timber Marketing of right of way timber; Construction: Fish Habitat Enhancement for offsets, as per DFO Fisheries Act; Accommodation at Sasquatch Crossing EcoLodge and Sts’ailes Lhawathet Lalem
### RUN OF RIVER (continued)

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Ownership Details</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taku River Tlingit First Nations</td>
<td>100% Owners</td>
<td>2MW plant</td>
</tr>
<tr>
<td>Tla-o-qui-aht First Nation</td>
<td>5.5 MW</td>
<td>Canoe Creek Project</td>
</tr>
<tr>
<td></td>
<td>In operation since 2010</td>
<td></td>
</tr>
<tr>
<td>Haa-ak-suk</td>
<td>6 MW</td>
<td>Tla-o-qui-aht First Nation 85% Barkley Group 15%</td>
</tr>
<tr>
<td>Winchie Creek</td>
<td>4.4 MW</td>
<td>100% Ownership by TFN</td>
</tr>
<tr>
<td></td>
<td>In Development</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Attention: Jamie Basset</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Partner: Barclay Management Group</td>
<td></td>
</tr>
<tr>
<td>Under Construction</td>
<td>Gitga’at First Nation will commence construction this year of a 1MW hydro project that will replace diesel generation. Gitga’at owns 100% of the project.</td>
<td></td>
</tr>
<tr>
<td>Under Construction</td>
<td>Tseshahnt, Toqaht, Ditidaht and Uchucklesaht First Nations all have run-of-river projects under development.</td>
<td></td>
</tr>
</tbody>
</table>

### SOLAR

<table>
<thead>
<tr>
<th>First Nation</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>T'souke First Nation</td>
<td>Canoe shed with a 40 kW project—straight grid tie, Administration office—22kW ground mounted PV with an additional 7kW on the roof utilized a grid tie with a back up battery for storing unused solar energy, fisheries building with a 6 kW call to grid net metering project</td>
</tr>
</tbody>
</table>

### GEOTHERMAL

<table>
<thead>
<tr>
<th>First Nation</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skeetchestn First Nation</td>
<td>Heating community School</td>
</tr>
<tr>
<td>Li'l'wat First Nation</td>
<td></td>
</tr>
</tbody>
</table>
WIND

Saik’uz First Nation  Nulki Hills Wind project (no EPA yet), and have the Isle Pierre Wind Project to work with that is now in the EAO process  Partner: Innergex

GDF Suez consulted with the Quatsino First Nation, Kwakiutl First Nation and the Tlatlasikwala First Nation.  First Nations have a resource royalty sharing agreement  99 MW project located at Cape Scott

Tseil-waututh Wind Power  Distributor of Wind turbines

i) BC Clean Energy Act  
http://www.bclaws.ca/civix/document/id/complete/statreg/10022_01  
See in particular s. 2(l) for Objectives for First Nations, s. 20 for First Nations Clean Energy Business Fund

ii) First Nations Clean Energy Business Fund Regulations 
http://www.bclaws.ca/civix/document/id/complete/statreg/377_2010

iii) Heritage Conservation Act  
http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96187_01

iv) Industrial Roads Act  
http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96189_01

v) Land Act, Part 2 for Use of Crown Lands  
http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96245_01

vi) Mineral Tenure Act  
http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96292_01

vii) Transportation Act, Part 5  
http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_04044_01

viii) Water Sustainability Act for Water licences come into force in 2016  
https://www.le.g.bc.ca/Pages/BCLASS-Legacy.aspx#%2Fcontent%2Flegacy%2Fweb%2F40th2nd%2F3rd_read%2Fgov18-3.htm

Water Act in force till 2016. Will then be repealed when WSA comes into effect  
http://www.bclaws.ca/civix/document/id/complete/statreg/96483_01

E) HELPFUL GOVERNMENT OF BC WEBSITES
B.C. FIRST NATIONS CLEAN ENERGY TOOLKIT

i) Front Counter BC  http://www.frontcounterbc.gov.bc.ca

ii) Major Projects Office  www.for.gov.bc.ca/major_projects/

iii) Investigative License for a Clean Energy project  http://www2.gov.bc.ca/gov/content/industry/natural-resource-use/land-use/crown-land/crown-land-uses/clean-energy/waterpower


ENVIRONMENTAL ASSESSMENT

v) BC Environmental Assessment Office:  www.eao.gov.bc.ca

vi) Guideline for selection of Valued Components and Assessment of potential effects  www.eao.gov.bc.ca/VC_Guidelines.html

LEASES ON CROWN LANDS

vii) Land Tenures Branch: looking for crown lease on lands:  http://www2.gov.bc.ca/gov/topic.page?id=27B50D9293BA4BAEBF621EC2B84BD7BD

WATER LICENSES AND WORKS IN AND AROUND WATER


x) How to apply for a Water License:  http://www.env.gov.bc.ca/wsd/water_rights/licence_application/index.html


xii) Assessment Methods for Aquatic Habitat and Instream Characteristics in support of Application to Dam, Divert or Extract Water from Streams in BC  http://www.env.gov.bc.ca/wld/documents/bmp/assessment_methods_instreamflow_in_bc.pdf

xiii) Guidelines for collection and analysis of fish and fish habitat data for the purpose of assessing impacts from small hydropower projects in BC  http://www.env.gov.bc.ca/wld/documents/bmp/guidelinesIFRv5_2.pdf

xiv) Information and reports of Independent Monitor under Water Licence  http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/


**FOR CROWN LAND LICENSES FOR RUN OF RIVER PROJECTS**


xx) How to apply for temporary or permanent use of highways, secondary roads or public rights of way, install power lines: http://www.th.gov.bc.ca/permits.htm

xxi) How to obtain permits to do any work within Parks and Protected Areas http://www.env.gov.bc.ca/bcparks/permits/

xxii) Free Use Permits for Use in investigative Phase—to remove timber <50 m3 https://www.for.gov.bc.ca/hth/timber-tenures/agreements/free-use-permit.htm


xxiv) Access Permit to construct roads off MOT roads http://www.th.gov.bc.ca/permits/1%20Permits.asp

**F) HELPFUL BC HYDRO WEBSITES**


iii) Queue list for interconnection—find out where you are on list https://www.bchydro.com/accounts-billing/moving-electrical-connections/electrical-
connections/transmission-generator-interconnections/queue.html

G) FEDERAL LAWS

i) Canadian Environmental Assessment Act 2012

ii) Regulations Designating Physical Activities (Defines what projects must undergo a Canadian Environmental Assessment)
http://laws-lois.justice.gc.ca/eng/regulations/SOR-2012-147/page-3.html#h-1

iii) Canadian Environmental Assessment Agency
www.ceaa.gc.ca/

iv) Harmonizing Federal and Provincial Environmental Assessments
www.eao.gov.bc.ca/federal_relations.html

v) Migratory Birds Convention Act
http://laws-lois.justice.gc.ca/eng/acts/M-7.01/

vi) Navigation Protection Act
http://laws-lois.justice.gc.ca/eng/acts/N-22/

H) HELPFUL GOVERNMENT OF CANADA WEBSITES

i) How to determine if Fisheries Act permits are needed—projects in or near water

ii) Self Assessment as to whether DFO need to review your Project

iii) Comprehensive Community Planning Guidebook

I) MAPS OF BC FOR LOCATING VARIOUS CLEAN ENERGY RESOURCES

i) Solar:
http://ecomsartsun.com/canadian-solar-maps-province/#jp-carousel-1062

ii) Wind:
Canadian Wind Energy Atlas: https://www.bchydro.com/content/dam/hydro/medialib/
internet/documents/environment/pdf/environment_wind_energy_resource_map_pdf.pdf

iii) Geothermal:
http://www.cangea.ca/bc-geothermal-resource-estimate-maps.html

J) PERMITTING AND PROJECT MANAGEMENT


K) CLEAN ENERGY PROJECT ANALYSIS

i) http://www.retscreen.net/ang/voice_slides_overview_intro.php

L) FIRST NATIONS CLEAN ENERGY BEST PRACTICES

Showcases T’souke First Nation, Kanaka Bar, Hartley Bay and Tla-o-qui-aht in BC and Arviat, Baker Lake, Swan Lake First Nation, Manitoba, Pic River, Ontario

ii) http://www.civicinfo.bc.ca/practices_innovations/community_hot_spot_for_solar_power--tsouke_first_nation--2009.pdf (lists other articles and DVDs about T’souke project)


iv) CANWEA: Features Cape Scott Wind Farm and Bear Mountain Wind Park

M) FINANCIAL PLANS

i) Westbank First Nations Financial Strategic Plan:

http://www.fnfmb.com/core-documents/

http://fngovernance.org/resources_docs/Financial_Templates.pdf

N) LAND USE PLANNING—FIRST NATIONS LUP
i) Chief Kerry Moose guide to LUP: [http://fngovernance.org/resources_docs/Land_Use__Occupancy_Mapping_Guidebook1.pdf](http://fngovernance.org/resources_docs/Land_Use__Occupancy_Mapping_Guidebook1.pdf)


iii) Gwich’in Land Use Plan: [http://fngovernance.org/resources_docs/Gwichin_Land_Use_Plan.pdf](http://fngovernance.org/resources_docs/Gwichin_Land_Use_Plan.pdf)


O) LEGAL ISSUES FOR PROJECTS


P) HERITAGE/CULTURAL ISSUES

i) First Nations Heritage Toolkit for assistance in any issues related to protection or alteration of heritage sites and objects: [http://d3n8a8pro7vhmx.cloudfront.net/ubcic/legacy_url/1623/UBCIC_HeritageBook.pdf?1426351398](http://d3n8a8pro7vhmx.cloudfront.net/ubcic/legacy_url/1623/UBCIC_HeritageBook.pdf?1426351398)

Q) COMMUNICATIONS TOOLKITS


R) JOBS AND EMPLOYMENT IN CLEAN ENERGY INDUSTRY

i) Map showing Clean Energy projects and number of jobs per project and types of clean energy: [http://www.pembina.org/bcjobsmap/](http://www.pembina.org/bcjobsmap/)

S) GROUPS INVOLVED IN CLEAN ENERGY
B.C. FIRST NATIONS CLEAN ENERGY TOOLKIT

i) BC Bioenergy Network:  http://bcbioenergy.ca

ii) BC Sustainable Energy Association (BCSEA):  http://www.bcsea.org/


iv) CanGea: Represents the interests of the geothermal industry in Canada and is working on unlocking the geothermal power within Canada. http://www.cangea.ca


vi) Community Energy Association of BC  http://communityenergy.bc.ca

T) FOUNDATIONAL COMMUNITY DOCUMENTS

i) Comprehensive Community Planning
https://www.aadnc-aandc.gc.ca/eng/1100100021972/1100100022090#tls

U) REMOTE COMMUNITY ELECTRIFICATION PROGRAMS
i) BC Hydro’s program [https://www.bchydro.com/energy-in-bc/our_system/remote_community_electrification.html](https://www.bchydro.com/energy-in-bc/our_system/remote_community_electrification.html)


V) FIRST NATIONS PLANS

i) First Nations Strategic Clean Energy Plan

ii) BC First Nation Energy Action Plan
[http://fnemc.ca/?portfolio=energy-action-plan](http://fnemc.ca/?portfolio=energy-action-plan)

W) STUDIES ON CLEAN ENERGY

i) London Economics Study on the Cost Effectiveness of Clean Energy Projects in light of Site C

ii) Pacific Salmon Foundation Independent Report on the effects of Run of the River Projects on Salmonids