Project: Hypothetical Run-of-the-River Hydroelectric Project (about 1 megawatt)

Ownership: Community Economic Development Investment Fund (CEDIF) and partner

Background:

In the hypothetical Municipality of Amidon, Nova Scotia, there is a former sawmill and powerhouse on one of the rivers. At this point along the river, the land slopes significantly and there is a drop (head) of about 5 metres within a distance of 100 metres along the river. The river is about 7 metres wide in this area. The sawmill closed in 1935. The former mill works have disappeared, save the remnants of some foundations and evidence of a disused earthen dam, now breached.

Photo credit: Alison Wright / Getty Images

Peggy Millhand, an entrepreneurial member of a local family, is familiar with this site and believes that the former mill site would be well suited for a hydro-electric generator. She has heard about the new COMFIT program and begun looking into the possibility of applying. Her idea for the project is to install a penstock that would divert a portion of the river flow through a hydro turbine before returning the water to the river further downstream. Peggy has talked about the project with her family and met with two other local residents to discuss it. They have also spoken with the municipal sustainability officer and some members of the municipal council, who have expressed their support for looking further into it. Peggy meets with two other interested community members to start a project team, and begin conducting research on the project.

1. How does this project meet the eligibility requirements for the COMFIT? What criteria will they have to check to ensure eligibility?

2. Once they have established that the project will be eligible for the COMFIT, what is their next step? (Consider your answer before looking at one possible answer on the following page.)

Rough resource assessment (1 to 2 months) $3,000 to $10,000 or volunteer time

In the rough resource assessment, you are trying to determine whether the project looks roughly feasible, and to find out whether there are any "show-stoppers", or fundamental issues that would make the project impossible to successfully implement. The idea is to invest a small amount of time and/or money to decide whether it is appropriate to continue. You would typically do the rough resource assessment before beginning a COMFIT application.

Rough resource assessment: Example table of tasks and resources (these may vary)

Task	Resources
Visit the site, observe and photograph: - Where would the penstock and powerhouse go? - Where is the nearest 3-phase distribution line?	Your own observations.
Estimate the river's seasonal or monthly average flow rate.	Department of Natural Resources, historical data, a hydrologist.
Estimate the percentage of the river's flow you could acceptably use for power generation.	Department of Environment, or speak with people who operate existing similar projects.
Estimate the size (capacity) of the generator based on the volume flow rate and head of the river. Make a rough estimate of the annual electricity production.	Refer to other similar projects, as well as turbine manufacturers.
Have a preliminary discussion with the Nova Scotia Power System Operator to get a first glance at interconnection feasibility.	Nova Scotia Power System Operator
Check the property ownership of the surrounding land, considering land access for penstock, powerhouse, power line and access road.	Nova Scotia Registry of Deeds
Ask people who live in the area, including local Mi'kmaq bands, about local conditions and support for the project.	People living near the site, and people, including Mi'kmaq, who may use this river for fishing or other uses.

After the rough resource assessment

Let's assume that in this case all of the outcomes of the rough resource assessment were fairly favourable and nothing was found that would obviously make the project impossible or impractical.

Peggy and her small group believe, based on their initial research, that the project appears to have potential. They have made a formal presentation to a municipal council meeting to explain their idea and gauge the level of support. Municipal council resolves to support the project in principle, including a call for further investigation and a meeting to gauge the public interest.

The project team has now grown to five people, all of whom see this project as an inspiring way for Amidon to increase its energy self-reliance. They realize that to take the next step will require more engagement with the community and some amount of funding.

The project team begins the process of forming a Community Economic Development Investment Fund (CEDIF), and hosts a public meeting to discuss the project and invite more people to join as supportive members and potential future CEDIF shareholders. Sixteen people attend the meeting. There is generally interest and support, with some questions and concerns about the economic viability of the project and about possible impacts of the project on fish in the river. Two people at that meeting express interest in joining the project team to continue working on the project.

3. Who will the project team want to have involved in the project team as it moves forward?

4. What is the next step the project team should take? (Consider your answer before looking at one possible answer on the next page.)

5. Taking the next step is going to be a lot more work and require additional resources. How will the group support and finance the up-front project development work?

Business case (3 to 6 months) $10,000 to $50,000 and/or staff time

The business case involves a more comprehensive and accurate estimate of electricity production, the capital and operating costs, and the return on investment. These are key elements of a business plan. At this point, it would be a good idea to register the project on the COMFIT website, www.nsrenewables.ca to establish its existence and access guidance that may be available.

Task	Resources
Register your project on the COMFIT website. Registering the project is the first step in the application and does not imply a commitment to complete the project (that comes later in the process). DOE will verify your organization and provide you with a login and password.	COMFIT website: www.nsrenewables.ca
Make a more accurate estimate of the capacity of the generator and the annual electricity production (+/- 10%).	Hydrologist, hydroelectric consulting engineer, or operator of a similar project.
Have the Nova Scotia Power System Operator complete an interconnection study.	Nova Scotia Power System Operator – cost between $1000 and $10,000.
Estimate the capital cost of the installation and the annual operating costs.	Synapse report to NS Utility and Review Board on COMFIT rates*, equipment suppliers, consultants, or operators of similar projects.
Determine your ownership, equity and debt financing options. The project must have majority ownership (51%) by eligible groups (any combination of CEDIFs, cooperatives, non-profits or Mi'kmaq band councils who wish to participate). The remaining 49% may be owned by a private for-profit company.	Potential equity partners in your community, and potential lenders (municipal lending fund, banks or credit unions, depending on ownership structure).
Estimate the financial viability of the project under the assumed conditions of ownership and financing.	Business consultants, New Brunswick Community Energy business plan (as a model).

* Synapse consultants have prepared an estimate of the costs and return for COMFIT projects, as part of the process of estimating the appropriate COMFIT rates as part of the Utility and Review Board hearings. They estimate the installed cost of a 1-megawatt hydroelectric generator is about $4.4 million dollars. The cost developed to support discussions regarding an appropriate feed-in-tariff rates for each technology are helpful benchmarks but do not replace site and technology specific costs developed for each project.

COMFIT Application

Let's assume the business case looks favourable. Johnathan G. Dreger, owner of Dreger Wood Products, a local producer of lumber from sustainably harvested wood, has also joined the team. The company is exploring a separate COMFIT application for combined heat and power at their mill, and is interested in being a partner in the hydropower project as well.

The team hosts a second public meeting to announce the partnership to develop the project. At this point, they are well into applying to the COMFIT program.

Three of the most challenging elements of completing a successful COMFIT project will be the following three elements.

Business Plan:

The project team will next have to complete a business plan that is comprehensive, detailed and compelling enough to support financing, including equity and debt, of around $4 million for the project. Simultaneous to this, they will work through the process of completing the COMFIT application.

Approvals and Permits:

There are numerous studies, approvals and permits that will be required for the project. These are described in the COMFIT Guide and briefly on the following page. The provincial government "one-window" process will also help guide the team to the right path.

Financing:

Any project of this magnitude will require sources of financing that may be unconventional, unfamiliar to the project team or challenging to find.

6. Does a COMFIT project fit a traditional business model? (Why or why not?)
   You can refer to the COMFIT training business plan module for ideas on this.

7. Which parts of the business planning process will be the easiest? The most challenging? Why?

8. Which parts of the approval and permitting process will take the most time and resources, or carry the greatest risk of not obtaining approval? (From table on next page.)

COMFIT Application: 12 parts 1 to 3 years $50,000 to $500,000

Depending on the project, the COMFIT application could take more or less time, and the cost of all the work to meet the COMFIT requirements could be lower or higher than the range suggested here. For example, a very small project would not likely require the same level of detailed resource assessment or environmental assessment. The sections of the application are detailed in the COMFIT Guide and the application form.

The project team has already, by this point, found most of what it needs to complete 1 through 7 of the application: Registration, ownership structure, project information, site information, technical information, business case, and community support. Regarding part 8, Aboriginal requirements, you will also have been in contact with any local Mi'kmaq communities early in the process to discuss the project and learn about their perspective on it. Parts 9 through 11 relate to permits and approvals required for the project with respect to requirements such as municipal bylaws, environmental regulations, and the preservation of cultural resources. A one-window COMFIT application process will help guide you through the permitting requirements and put you in contact with the appropriate people in the provincial government.

Task	Resources
Obtaining municipal permits.	The local municipality.
Environmental permits – a hydro-electric installation of approximately 1 MW would require some level of provincial and/or federal environmental impact assessment.	Department of Environment, environmental impact assessment consultants
Special places requirements.	Department of Communities, Culture and Heritage
Other permits.	Through the one-window COMFIT application, you can determine whether other permits are needed.

Some of the most challenging parts of the project development process are not explicitly covered in the COMFIT application, but are nevertheless crucial to the success of the project, such as building a base of equity capital for the project, securing financing, choosing equipment suppliers and contractors, managing the installation project, and planning for ongoing maintenance and operations. The project team must develop (or hire) the ability to finance and manage the renewable electricity generation project. A private partner can bring expertise and experience to this endeavour.