A guide to advancing low-carbon energy innovation in Ontario rural and remote communities

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PARTNERS

Pollution Probe

QUEST

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QUEST Canada

QUEST Canada is a registered Canadian charity that supports communities on their pathway to net zero. Since 2007, we've been facilitating connections, empowering community champions and advising decision-makers to implement energy use and emissions reduction solutions that best meet community needs and maximize local opportunities. We develop tools and resources, convene stakeholders and rights holders, and advise decision-makers – all with the goal of encouraging, assisting, and enabling communities to contribute to Canada's net-zero goals. Visit us at questcanada.org.

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Glossary

Proponent: A private company, a utility, a government, a municipality or any other actor that wants to promote low-carbon energy.

Facilitator: A trusted individual or group, from within or outside the community, that helps build the connection between the community and the proponent. In some communities, the facilitator may also be the energy champion.

Energy champion: An individual or group, generally from within the community, that takes a leading role in articulating and promoting the future energy vision for the community, including clean energy innovation. The champion could be a councillor, band employee, or an engaged community member.

1 Background and context

The low-carbon energy innovation community framework provides guidelines to help communities and their stakeholders, including municipalities, utilities, industries, and governments, to understand how to promote innovative low-carbon energy projects at the community level.

The framework uses a "choose your own adventure" approach, acknowledging that each community and each potential project has unique conditions and circumstances. It is also designed to adjust to diverse users, including industry stakeholders, utilities, community energy champions, municipalities, and government entities. As a result, some stages of the framework will be relevant to specific stakeholders, while others may not be.

Communities are a critical part of the low-carbon energy transition across Canada. Apart from being energy consumers, energy projects are developed within communities. Deploying low-carbon energy often requires innovation in technology, deployment and business models in order to ensure that communities can benefit. Yet, the frameworks for deploying low-carbon energy have mainly focused on urban areas. Success in rural and remote communities relies on robust social acceptance, and hence, engagement is an essential component. Engaging communities early, ensuring they understand, and enabling them to participate in and benefit from the project would help promote low-carbon energy at the community level.

The project has developed a framework to enable Ontario's rural and remote communities to better understand, participate in, and benefit from the energy transition.

The framework (see **Figure 1**) consists of three stages:

1. **The early stage** focuses on gathering community information and identifying a facilitator to bridge communication between the community and the proponent.

2. **The co-creation stage of the project** focuses on engaging with the community, building trust, and developing low-carbon innovation projects collaboratively.

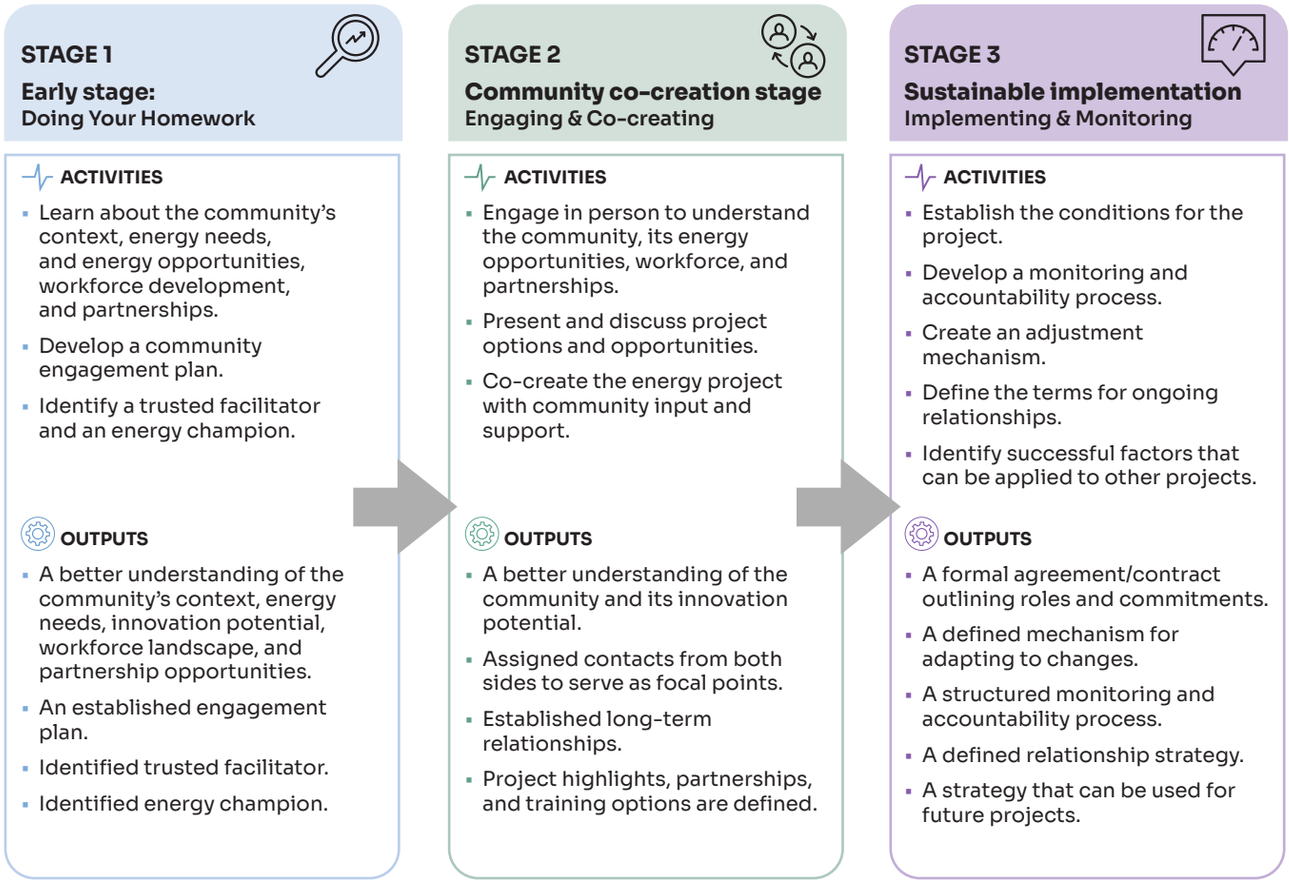
3. **The implementation stage** ensures successful project implementation and effective ongoing operation and relationships.

In addition to the framework, there are two additional files available on the website. Case studies demonstrating how low-carbon energy innovation initiatives are successfully deployed within local communities are provided in Annex A. Annex B is a workbook to help interested parties implement the framework.

Figure 1: Framework overview

Community Energy Development Process

A comprehensive three-stage pathway from initial research to sustainable implementation ensuring community alignment and long-term success.



2 Framework modules

The framework consists of an integrated approach that includes a series of modules. Each module outlines its purpose, rationale, suggested methods, key steps for the proponent to follow, and necessary tools, such as worksheets. Stakeholders and communities can independently evaluate and implement the relevant modules based on their needs and interests. Table 1 below outlines the framework modules along with their intended target audiences.

Table 1: Target audience for framework modules

Module		Community	Private sector/ Utility	Municipality/ Provincial government
Stage 1				
Module 1.1	Learn about the community and its energy needs and challenges	✘	✔	✔
Module 1.2	Learn about community energy innovation opportunities and challenges	✔	✔	✔
Module 1.3	Develop a community engagement plan	✘	✔	✔
Module 1.4	Identify a trusted facilitator	✘	✔	✔
Module 1.5	Identify an energy champion	✔	✔	✔
Stage 2				
Module 2.1	Community engagement	✔	✔	✔
Module 2.2	Community benefits	✔	✔	✔
Module 2.3	Community engagements for a collaborative project	✘	✔	✔
Stage 3				
Module 3.1	Regulatory considerations	✔	✔	✘
Module 3.2	Establish the project activities and steps	✔	✔	✔
Module 3.3	Project monitoring	✔	✔	✔
Module 3.4	Future opportunities	✔	✔	✔

✘ **Indicates that the specified module does not apply to the target audience mentioned in the first row.**

✔ **Indicates that the specified module applies to the target audience mentioned in the first row.**

3 The low-carbon energy community framework

1. Early stage: Doing your homework

Stage 1 Overview:
This stage involves preparation before engaging with the community and project decision-making. It focuses on understanding community needs, identifying innovation opportunities, and selecting a trusted facilitator and energy champion to ensure effective collaboration between the proponent and the community.

Module 1.1 Learn about the community and its energy needs and challenges

Rationale: Each community is unique and affected by various factors, including location, socio-economic conditions, cultural values, governance, resources, funding, infrastructure, and policies. It's essential to involve local communities early, maintain transparent communication, and provide project information. Rural communities are diverse, with varying opinions and support for energy development. Tailored approaches are essential, as duplicating strategies without considering local contexts could hinder innovation.

Methods: Research public sources, local news and community forums. Attend relevant events and engage with residents and stakeholders familiar with the community.

Points to consider:

- Each community is unique, with its own characteristics and priorities.
- Each community will have different energy innovations needs or interests depending on their location, resources and local priorities.
- Rural and remote communities remain highly vulnerable to extreme weather events, such as ice storms, which can lead to extended power outages lasting several days.
- Communities with local generation (e.g., large hydro projects for the provincial system) do not directly benefit from this power, as it goes into the grid.
- The growing demand for electricity from industries such as mining, along with the transition from natural gas to electric power (e.g., for heat pumps or EVs), highlights the need for additional generation capacity.
- Funding can be limited in communities.
- High upfront capital costs for low-carbon technologies (e.g., heat pumps) could hinder their implementation despite long-term cost savings.
- Municipal governments in rural and remote areas may lack the capacity, workforce, knowledge, and leadership to lead a low-carbon innovation project, and the resources to intervene directly.
- The municipal government may be responsible for a large area with a minimal staff that needs to deal with all municipal issues.
- The community's energy utilities may not have strong and trusted relationships with the community.

We need to expand the definition of energy. One community stated that a fishing derby could be considered energy as it reduced the need to transport food into the community.

Key steps:

1.1.1 Learn about the community context

- Gather information about the community's history, culture, society, people, structure, energy landscape, economic conditions, political landscape, demographic trends, sociographic trends, and past efforts.

1.1.2 Learn about the energy needs, net-zero actions and challenges

- Gather information regarding current energy use in the community, economic conditions, community plans or land use plans.
- Identify the community's main challenges and opportunities in energy development and reducing emissions.
- Understand projected energy needs to address short and long-term needs.
- Identify key stakeholders and entities in the energy sector and create connections.

Tools: **Module 1.1 Annex B_Workbook**

Module 1.2 Learn about community energy opportunities and challenges

Rationale: Understanding the opportunities, identifying potential partnerships, and workforce potential in a community will help align the projects with community needs while advancing low-carbon energy innovation and development. Our interviews showed that offering training programs and encouraging partnerships between proponents and communities encourage community participation in the project.

One community we talked to had a one-phase power connection. That severely limits the amount of new generations or the demand that can be installed, and it can either limit innovation or be a catalyst. It is important to know the specific conditions of the communities being engaged.

Methods: Research public policies and funding programs, actively engage with the community and its stakeholders, and participate in relevant community events.

Points to consider:

- Proponents need to understand the specific conditions of the community that will affect potential projects, as these factors can either limit or drive development.
- Municipalities may not have the capacity and expertise to apply for grants or participate in regional energy planning.
- Limited capacity to explore or implement models such as energy-as-a-service.
- A general lack of time, resources, and technical support to lead climate and energy projects.
- Rural areas often lack dedicated climate action teams or regular planning forums to support low-carbon development.
- Energy needs are often managed at the individual level, and there has been a limited push to promote collective or community-based solutions.
- Small municipalities have limited new construction activity, resulting in fewer opportunities to integrate innovative technologies into buildings. As a result, there is a pressing need to invest in retrofitting existing buildings, but a lack of accessible funding hinders progress.
- Local communities and municipalities lack access to detailed energy data, which could support effective planning.
- No visual energy mapping tools are available to identify opportunities and prioritize actions, as sometimes exist at the federal level.

Key steps:

1.2.1 Define low-carbon energy innovation using the definition (**Text box 1**) established in a parallel project, the Low-Carbon Energy Innovation (LCEI) initiative.[1]

Text box 1: Low-carbon energy innovation – a definition

> Low-carbon energy innovation strategies refer to policies, regulatory frameworks and factors that enable research, development, deployment, new practices, new business models, and new products or services that reduce GHG emissions in the energy sector, aligning with Canada's net-zero targets.

1 The LCEI initiative helps to assess low-carbon energy innovation using a National Low Carbon Innovation Assessment that identifies strengths and gaps and highlights successful pathways forward in each jurisdiction across Canada. For more information see https://www.pollutionprobe.org/low-carbon-energy-innovation-project/

1.2.2 Learn about opportunities and challenges

- Evaluate the community's access to the information and resources necessary to understand and deploy low-carbon energy.
- Identify opportunities that could support energy or net-zero goals or improve residents' quality of life.
- Identify energy needs for the community.
- Identify success stories[2] and effective past strategies that highlight the collaboration between communities and proponents to promote innovation.
- Consider the community's motivation for participating in energy projects.
- Assess innovation challenges and opportunities within the community.
- Evaluate the supportive innovation needs of the community from industries, municipalities, governments, and utilities (e.g., government or utility funding).
- Prioritize the needs of the community.

1.2.3 Learn about funding options for innovation projects

- Evaluate the community's available resources.
- Identify funding options (e.g., federal funding).
- Assist the community in preparing and submitting funding applications.

1.2.4 Learn about workforce skills opportunities

- Evaluate the workforce skills needed.
- Identify training opportunities that would enable community members to be part of the workforce in developing innovative initiatives.
- Identify the challenges and opportunities for developing and maintaining a skilled workforce.

1.2.5 Learn about potential community and proponent partnership opportunities

- Identify and develop strategies to build effective community and proponent partnerships for projects.
- Identify and develop the community benefits of partnerships in projects.
- Identify how to co-create energy projects.

Tools: **Module 1.2 Annex B_Workbook**

Module 1.3 Develop a community engagement plan

Rationale: Strong community engagement is essential to the success of energy projects. It involves working closely with community stakeholders and building long-term relationships to ensure the project's success and a positive reputation.[3]

Methods: Review best practices for different engagement strategies, research public websites, local news, and community forums, and engage with community stakeholders.

Points to consider:

- There is sometimes limited engagement from electricity providers in supporting community energy initiatives.

Key steps:

1.3.1 Prepare a community engagement plan

- Identify strategies to engage the community and to encourage community members to participate.
- Prepare a community engagement plan.
- Incorporate strategies in the engagement plan to address community challenges.
- Prepare preliminary ideas for discussion to guide initial engagements.

2 Success stories are defined as significant collaborations between communities and proponents that result in the successful implementation and operation of an innovative project within its planned initial time frame.

3 Canadian Renewable Energy Association. Wind Energy Development. Best Practices for Indigenous & Public Engagement. October 2017. https://renewablesassociation.ca/wp-content/uploads/2020/06/Wind-energy-development-best-practices_June-2020.pdf

1.3.2 Develop an engagement plan tailored to local community leadership

- Involve community leaders and champions in identifying energy needs and shaping tailored solutions.
- Identify strategies to encourage community leadership to participate.
- Prepare preliminary ideas for discussion to guide initial engagements.

Tools: Module 1.3 Annex B_Workbook

Module 1.4 Identify a trusted facilitator

Rationale: Promoting energy innovation in the community relies on building trust between the proponent, be that a private company, a utility or even the municipality, and the community. Through multiple interviews with the communities, we've learned that they prefer to work with familiar, trusted individuals. Identifying a facilitator can help connect the community with the proponent, encouraging open communication and cultural sensitivity for successful innovation collaboration.

Methods: Search online, engage with stakeholders, and post requests in local community forums for suitable facilitators.

Points to consider:

- Communities may prefer to collaborate with individuals they know and trust.

Key steps:

1.4.1 Identify a trusted facilitator

- Use the list of individuals and entities from section 1.1.2 to identify the facilitator.
- Establish the relationship between the proponent and the facilitator and formalize it in a contract.

Tools: Module 1.4 Annex B_Workbook

Module 1.5 Identify an energy champion

Rationale: Supporting low-carbon energy development and innovation in the community requires a trusted leader committed to the project's articulation, often called an energy champion. This champion can be a third party, like a councillor, or municipal leader, or a paid role, such as a community facilitator or an engaged community member. The champion's role is to plan, implement, and evaluate energy initiatives while building trust, reducing resistance, improving communication between the community and the proponent, and ensuring cultural sensitivity.

Methods: Engage with stakeholders and community members.

Key steps:

1.5.1 Identify an energy champion

- Look for a community energy champion to help plan, implement, and evaluate energy-related priorities.

Tools: Module 1.5 Annex B_Workbook

2. Community co-creation innovation stage

Stage 2 Overview:
This stage focuses on establishing the energy project and identifying opportunities while engaging with the community. It highlights the importance of building trust and collaboratively developing projects.

Module 2.1 Community engagement

Rationale: This module emphasizes community engagement to collaboratively develop a mutually beneficial project. Ideally, this should be done in person to better understand the local context, vision, energy needs, opportunities, and innovation challenges, helping the community and the proponent align initiatives with their shared goals. This approach encourages a long-term relationship between the proponent and the community.

Methods:

- Use workshops, meetings, and consultations to collect feedback and ensure everyone's expectations are aligned.
- Attract community members to participate in the engagements.
- Invite stakeholders (e.g., regulators, private companies) to participate.
- Follow the engagement plan that was established in the early stage.
- Appoint a dedicated contact person to address community needs and respond to questions.
- Establish clear communication channels with community contacts.

> **"Must drink 500 cups of tea together before we speak."**
>
> —WORKSHOP PARTICIPANT

Points to consider:

- Current planning processes overlook newer technologies, such as heat pumps.
- There is not much encouragement by municipalities or local governments to adopt the right technologies.
- Early-stage community involvement is essential to maintaining successful operations.[4]
- Work with communities from the start, as without their involvement, projects are less likely to succeed.
- Engage the community in person, if possible, to encourage stronger connections.
- Be present where the community already meets, such as at local fairs or events.
- Respect the community's pace, be patient, and acknowledge that communities may operate on their own timelines.
- Be humble, authentic, and honest in your interactions with community members.[5]
- Address all questions and concerns and allow for clear and open dialogue on the project and the process.[6]
- Build long-term relationships between the community and the proponent.
- It is important to get information from people in a timely manner so they can make proactive decisions. This encourages understanding of the potential of new technologies and avoids distrust of information.
- Most municipalities are not building new buildings; instead, they are retrofitting existing ones, and there is a need to ensure that the new retrofits are low-carbon.
- There is an absence of partnerships, co-ownership models, or collaborative planning efforts by third-party organizations.

Key steps:

2.1.1 Learn more about the community context, energy needs and opportunities

- Repeat sections 1.1, 'Learn about the community' and 1.2, 'Learn about community energy innovation opportunities' through engagements to gather new information.

2.1.2 Strengthen community capacity for energy decision-making

- Provide tools for communities to express their energy needs and priorities.
- Develop educational materials tailored to local contexts.

2.1.3 Engage communities from the start of the process

- Involve communities from the start in energy and climate policy development.

2.1.4 Build long-term partnership

- Build long-term partnerships based on mutual respect, shared decision-making, and accountability.

4 IRENA. Renewable energy for remote communities: a guidebook for off-grid projects. 2023. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2023/Nov/IRENA_Remote_Communities_2023.pdf

5 NREL. Community Energy Planning: Best Practices and Lessons Learned in NREL's Work with Communities. 2022. https://docs.nrel.gov/docs/fy22osti/82937.pdf

6 Canadian Renewable Energy Association. Wind Energy Development. Best Practices for Indigenous & Public Engagement. October 2017. https://renewablesassociation.ca/wp-content/uploads/2020/06/Wind-energy-development-best-practices_June-2020.pdf

2.1.5 Provide clear guidance

- Develop simple, consistent policies so communities know what to follow to meet climate goals.

2.1.6 Highlight successful projects

- Share successful stories from similar-sized communities, especially those highlighting funding approaches, local benefits, and resilience outcomes.
- Demonstrate projects that have improved reliability during extreme events (e.g., ice storms) using low-carbon solutions such as batteries, solar PV, and wind.

2.1.7 Raise awareness and knowledge

- Educate the community on new technologies, such as heat pumps.
- Focus on community education on environmental alternatives.
- Put effort into community awareness.

2.1.8 Offer tailored energy pathways

- Support models such as "energy-as-a-service" to reduce upfront costs and financial risk.
- Develop "community energy packages" that bundle technologies with service and installation options.
- Support procurement flexibility (e.g., leasing, ownership, service contracts) to meet local preferences and capacities.
- Encourage local co-ownership and cooperative models to increase benefit sharing.
- Design solutions that match each community's structure and abilities.

2.1.9 Connect energy to other local goals

- Link low-carbon energy efforts to community goals such as economic development, preparing for extreme weather, and creating new income sources.
- Shift the conversation from just decarbonization to energy reliability and resilience.

2.1.10 Make data easy to use

- Develop regional energy data systems and interactive maps to support local decision-making, such as identifying rooftop solar potential.

2.1.11 Share the project options with the community

- Present innovation project options, including for partnerships (e.g., co-ownership).
- Present training and capacity building opportunities (e.g., PV technician programs).

2.1.12 Integrate clean technologies into planning

- Guide the community on integrating new technologies into their planning processes.

2.1.13 Keep the conversation going

- Encourage informal and accessible communication channels to promote collaboration on low-carbon solutions.

Tools: **Module 2.1 Annex B_Workbook**

Module 2.2 Community benefits

Rationale: When community members understand how a project benefits them, such as through job creation, economic growth, improved services, or environmental improvements, they are more likely to engage and support the project. Outlining these benefits helps build trust, gain support, and ensure long-term success.

Methods: Connect with the community, communicate openly, and work together to highlight the project's benefits.

Points to consider:

- Benefits may vary across communities and stakeholders, with different interpretations of their meaning.

Key steps:

2.2.1 Support local capacity

- Provide communities with support for grant writing, partnership development, and regional energy planning.

2.2.2 Make projects more affordable

- Offer financial tools that bundle benefits and spread upfront costs over time to make low-carbon projects, such as net-zero buildings, more accessible to rural and remote communities.

2.2.3 Communicate the project's benefits to the community (e.g., co-ownership, training opportunities).

Tools: Module 2.2 Annex B_Workbook

Module 2.3 Community engagement for a collaborative project

Rationale: Co-creating the energy project with the community ensures that their insights and needs are integrated and aligned with the project. This enables a shared vision, leading to a greater potential for long-term success.

Methods: Engage with the community, share information, and collaborate to define the project.

Key steps:

2.3.1 Co-create the project

- Present and communicate the project.
- Address the community concerns.
- Establish community support.
- Define the project.

Tools: Module 2.3 Annex B_Workbook

3. Sustainable implementation

Stage 3 Overview:
This stage focuses on implementing the project, regulatory considerations, monitoring progress, and ensuring effective ongoing operations and relationships.

Module 3.1 Regulatory considerations

Rationale: Regulatory considerations, such as environmental impact assessments, infrastructure permits and building permits, are essential components of any energy project within a community. By addressing these factors early, energy projects can ensure compliance, mitigate risks, avoid delays and identify potential challenges early in the process. This approach leads to smoother implementation and long-term success.

Methods: Learn about the community and provincial regulations related to the project. Next, engage with key stakeholders and regulators to deepen your understanding of local regulations.

Points to consider:

- Each community has unique circumstances, with varying regulatory requirements and infrastructure needs, leading to different regulatory conditions.
- Explain the regulation requirements to the community and be fully transparent about them.

Key steps:

3.1.1 Learn about local and provincial regulations

- Identify relevant regulatory entities and their contact information.
- Understand the regulations that apply to the project and the infrastructure needed.
- Validate your understanding of the regulations by communicating with stakeholders and regulatory entities.
- Engage with the community to explain the regulatory process.
- Consider inviting a regulator representative to visit the community in person.

Tools: Module 3.1 Annex B_Workbook

Module 3.2 Establish the project activities and steps

Rationale: Setting clear project terms and workplan is essential for ensuring all participants understand the project, their responsibilities, commitments, benefits, roles, and funding resources. A clear understanding of these conditions enables trust and builds effective collaboration.

Methods: In-person meetings with the community to establish the final agreement.

Key steps:

3.2.1 Create a final agreement with the community

- Define the project's terms for short or long-term innovative projects, including funding resources, responsibilities, training, timeline, partnerships, etc.
- Identify the factors that could leverage additional projects or development. This will encourage innovation and establish a strong foundation for future projects aligned with broader goals.
- Sign the contract/ agreement.
- Repeat Module 3.1 on regulatory considerations, if necessary, based on the final agreement signed with the community and if any regulatory adaptations are needed.

Tools: Module 3.2 Annex B_Workbook

Module 3.3 Project monitoring

Rationale: Ongoing monitoring to ensure that the project remains on track and adaptable to arising challenges and changes.

Methods: Meet with the community and municipal leaders, or government officials, where applicable, to develop a detailed accountability process and progress indicators.

Points to consider:

- Maintain a long-term relationship with the proponent and the community during all the project phases.
- Support and engage with the community throughout the project, not just at its beginning.

Key steps:

3.3.1 Create a monitoring and accountability process

- Identify the factors that will provide ongoing support for the project.
- Develop an adjustment mechanism[7] to adapt to unexpected changes, evolving community needs, and technological advancements.
- Define the project maintenance and accountability process.
- Establish the terms for ongoing relationships between the community and the proponent throughout the project.
- Regularly report to the community and to municipal leaders/government officials.

Tools: Module 3.3 Annex B_Workbook

Module 3.4 Future opportunities

Rationale: A successful project benefits the community where it takes place. It also serves as an example for other communities. Building on what works and what communities trust in a proponent can help drive more low-carbon energy development.

Methods: Meet with the community, partners, and other proponents to assess lessons learned and share with other communities.

Points to consider:

- Community members' experiences and success stories can affect perceptions and support for future energy projects, either encouraging or hindering their development.

Key steps:

3.4.1 Identify leveraging factors for future projects

- Identify and apply the factors that will leverage this project to enable additional projects.

3.4.2 Share the lessons learned

- Share the lessons learned from this project to inform and improve future initiatives, ensuring that everyone benefits from previous experiences.

Tools: Module 3.4 Annex B_Workbook

7 An adjustment mechanism is a structured approach that enables a project to stay flexible and responsive to unexpected changes, evolving community needs, and technological advancements. For example, an adjustment mechanism can be established that includes:
1. Predefined action plans to address potential risks, such as regulatory changes, shifting energy demands, community needs or the adoption of new technologies.
2. Ongoing engagement with communities to ensure the project remains aligned with their priorities.
3. Regular check-ins with key stakeholders to ensure the project continues as planned.

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