ARCTIC SUSTAINABLE ENERGY FUTURES TOOLKIT

PROPOSAL FOR FUNDING

INTRODUCTION

The **Arctic Sustainable Energy Futures Toolkit** will be a print and web-based guide for communities to follow when developing their comprehensive community energy plans. This step-by-step toolkit will transfer knowledge using best practices, resource guides, case studies, videos, worksheets, and templated pathways to help communities create and implement their energy visions. In addition, the Toolkit will provide resources to increase energy literacy and capacity for community members build bridges between communities and agency officials and subject matter experts, and create a network of circumpolar community energy leaders.

Through the development of the Arctic Energy Futures Toolkit, communities will:

1. Project the short and medium term energy demand trends and requirements in their region;
2. Understand the impacts of diesel power reliance and supply constraints on social conditions, the environment, and economic development in their region;
3. Identify options for energy demand reductions, enhanced productivity for diesel systems, energy efficiency, and renewable energy;
4. Review off-grid, microgrid and regional grid examples from around the Arctic;
5. Create wise and creative energy planning processes for the Arctic through community visioning and by examining lessons learned and pre-existing solutions;
6. Increase energy literacy around energy systems infrastructure, energy efficiency and conservation, and renewable energy opportunities;
7. Work collaboratively with other communities that are creating their Sustainable Energy Futures Plans; and
8. Prepare a Sustainable Energy Futures Plan through research and discussions between government and partner organizations with the aim of putting the plan into action and securing adequate capital and capacity for implementation.

WHAT IS THE CURRENT LANDSCAPE OF ENERGY PRODUCTION IN THE ARCTIC?

As the above graphic illustrates, throughout the Arctic there are communities whose are not on the power-grid. Shifting these communities towards renewable sources of energy is a common goal.

In Canada, there are 175 off-grid communities that rely on diesel power generation, 140 of which are dependent exclusively on diesel. In this, Yukon is furthest ahead in shifting towards renewable; 93% of electricity generation is hydro, 6% diesel and the remainder is from wind and solar. NWT by contrast has work to do: 43% of its power generation comes from diesel, 36% from hydro, and 20% from natural gas, and the remainder from wind and solar.

In Nunavut, there is a lot of progress towards shifting towards renewables as 99.94% of power generation is from diesel, leading to expenditures of $39 million on diesel in 2010.

Shifting towards renewable energy is also important from an economic perspective. Globally, the market for clean energy is $1 trillion per year and is anticipated to continue to grow. Renewable energy is also employing 8.1 million people around the world. Shifting towards renewable energy – in addition to providing reliable energy – also has the benefits of reducing costs, creating jobs, and mitigating environmental impacts.

WHAT'S BEING DONE?

Community Energy Plans (CEP) – variations exist across the Arctic – are energy planning processes that have traditionally been used to assess a community's energy use, local and imported resources, carbon emissions, and demand. CEPs have been created in many off-grid communities already; in Canada's Northwest Territories every community is represented by a CEP, and in Alaska the Alaska Energy Authority works with communities to develop local and regional energy pathways. Greenland's *Nukissiorfiit*, Iceland's *Orkustofnun*, the Swedish Energy Agency and Finland's Ministry of Employment and Economic Affairs also use variations of this tool.

CEPs take varying forms in different geographies, jurisdictions, and regulatory regimes, but the main issue amongst almost all communities is around implementation of these plans.

Some of the most common challenges associated with CEP implementation include:

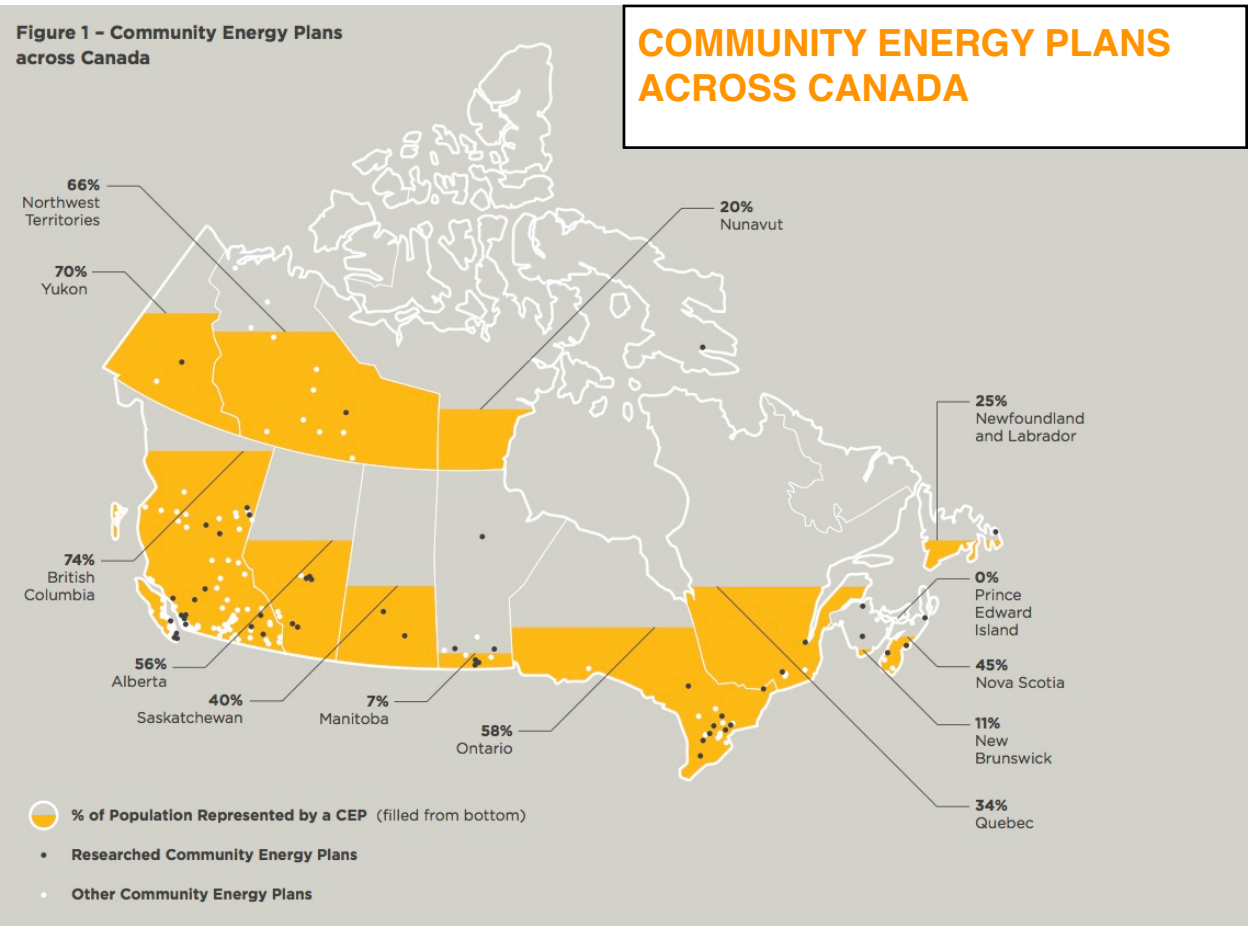
1. Financial capacity to move projects forward;
2. Static and outdated plans that don't align with the current energy landscape;
3. Limits of local government authority to move plans into action;
4. Plans don't reflect the community's energy vision; and
5. Lack of political, stakeholder and staff support.

With the affordability of renewables, there is a growing need for municipal governments and community members, working closely with regional and national agencies and experts, to play a substantive part in the energy planning process in their respective areas. In the Nordic region, the challenge instead may be the growth of industrial activity, economic development initiatives, population transfer, and even community relocation that require a reevaluation of energy needs, resources and goals.

Across the Canadian North, there have been a number of small-scale renewable projects, but there is a need to do more.

GWICH'IN COMMUNITIES HAVE BEEN LEADERS IN MAKING THE SHIFT TOWARDS RENEWABLE ENERGY

Inuvik has installed a wind energy project. In Aklavik, there is progress towards a solar installation with special high efficiency generation (costing $420,000), which saves 42 tonnes of Greenhouse Gases annually. Additionally, Old Crow – which is the one exception to Yukon's 100% renewable energy achievement – has plans to install a solar storage system.



WHY IS THE TIME RIGHT FOR THIS PROJECT?

There is a confluence of factors internationally, nationally, and locally that make the time right for this project.

Around the World

The United Nations Sustainable Development Goals (SDGs) have recognize the importance of affordable and clean energy (Goal 7), notably that:

By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology

The SDGs recognize that "energy is the dominant contributor to climate change, accounting for 60 per cent of total greenhouse gas emissions" and that therefore, "reducing the carbon intensity of energy is a key objective in long-term climate goals".

Across Canada

Budget 2017 recognizes the importance of reducing the reliance on diesel. There is an entire section of the budget dedicated to the goal to "Reduce Reliance on Diesel in Indigenous and Northern Communities", which commits to provide $21.4 million over four years for deploying renewable energy projects in 2017. In addition, $400 million is earmarked for the Arctic Energy Fund, dedicated specifically for communities over the 60th parallel and $220 million for projects below the Arctic Circle.

When it comes to clean technology, Canada has the opportunity to be a true global leader – creating jobs for Canadians while helping to meet our climate change goals… [and are] committed to double its investment in clean energy research, development and demonstration over the next five years.

Canada is also in the process of updating its Arctic strategy, which is anticipated to place considerable emphasis both on economic growth and climate change. GCI will be playing an active role in the co-development of this new strategy and plans to emphasize the need for renewable energy as part of the strategy. There are also discussions at the national level about setting a target for reducing diesel power generation to small communities by 25% by 2050. In the NWT alone that would account for 13,000 tons of C02 emissions saved per year.

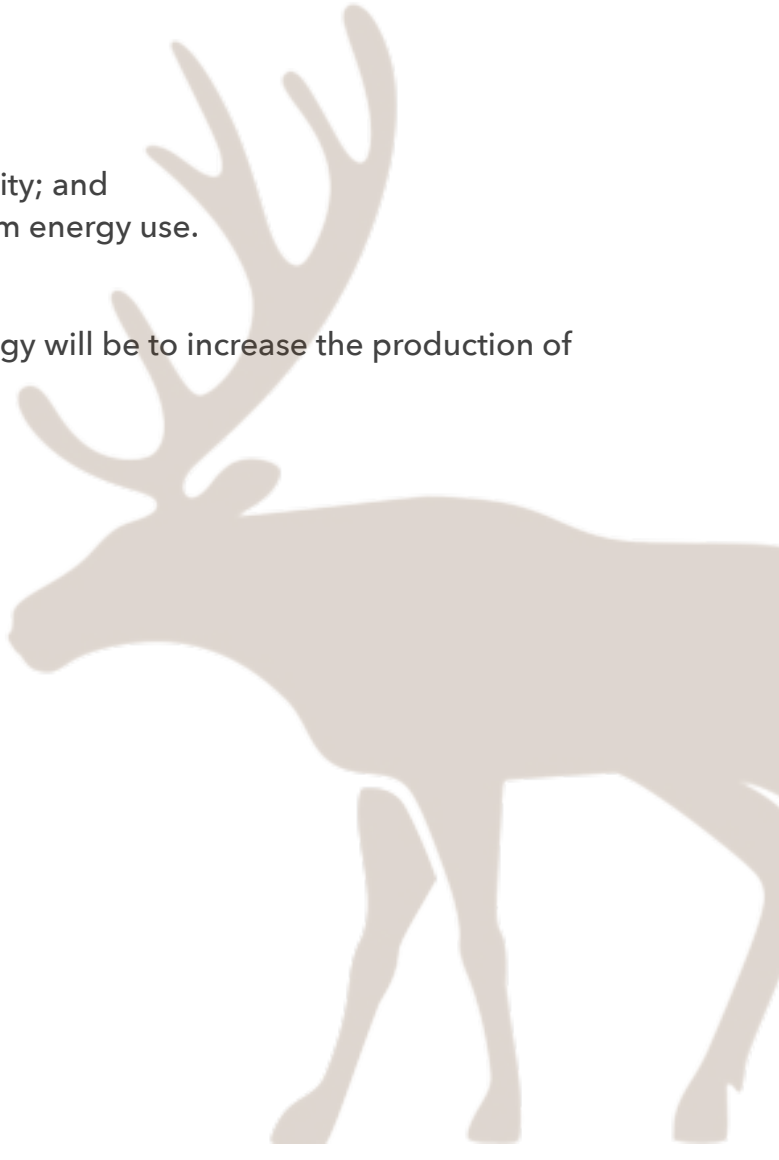
In the Northwest Territories

Similarly, the timing is right for this project at the territorial level. The Government of the Northwest Territories is undertaking to develop a new Energy Strategy.

The Strategy will have three objectives:

1. Ensuring energy reliability;
2. Addressing environmental affordability; and
3. Reducing environmental impacts from energy use.

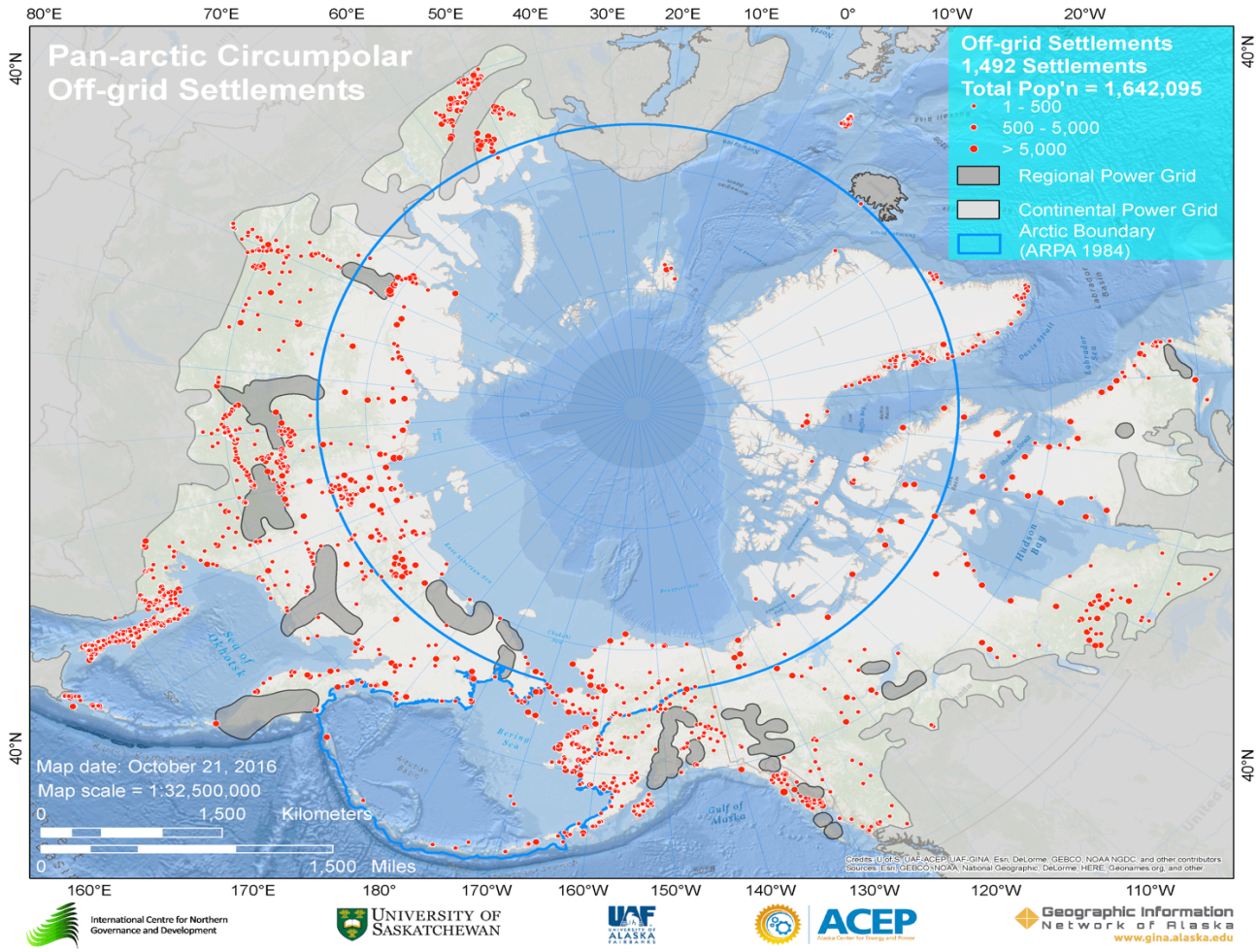
One of the priorities of the new energy strategy will be to increase the production of renewable and alternative electricity.



WHY IS THIS PROJECT NEEDED?

To get ready to capitalize on these investments, communities need to be prepared to engage in conversations with policymakers, have the information to apply for programs, and respond to requests from outside proponents that may approach the communities with interest in working with them on renewable projects. The Toolkit will provide that vital resource.

The Fullbright Arctic Initiative Group studied Developing Renewable Energy in Arctic and Sub-Arctic Regions and Communities, their working recommendations highlight the importance to "create opportunities for knowledge sharing and development of core competencies at the local level in the renewable energy sector". They found that, "Providing avenues for acquiring the business, technical and leadership skills required to manage and operate a project successfully is therefore essential, but developing the human capacity can be a significant challenge for communities across the Circumpolar North".



International Centre for Northern Governance and Development

University of Saskatchewan

UAF University of Alaska Fairbanks

ACEP Alaska Center for Energy and Power

Geographic Information Network of Alaska
www.gina.alaska.edu

WHOSE INVOLVED?

Gwich'in Council International is the project lead within the context of the Sustainable Development Working Group of the Arctic Council. We are engaging expert partners in Lumos Energy to complete this project.

About GCI

Gwich'in Council International (GCI) represents 9,000 Gwich'in in the Northwest Territories (NWT), Yukon, and Alaska as a Permanent Participant in the Arctic Council; the only international organization to give Indigenous peoples a sit at the decision-making table alongside national governments.

GCI's membership consists of two representative bodies in Canada: Gwich'in Tribal Council (GTC), who represents the beneficiaries of the Gwich'in Land Claims Settlement Act in NWT and the Vuntut Gwich'in First Nation (VGFN), which is a self-governing First Nation in Old Crow, Yukon. GTC and VGFN joined by seventeen Alaskan Native Villages. GCI supports Gwich'in by amplifying our voice on sustainable development and the environment at the international level to support resilient and healthy communities.

GCI is a not-for-profit organization with an office in Whitehorse, Yukon. It has one full-time staff member and a volunteer Board of Directors.

About Lumos Energy

Lumos Energy is Canada's leading Clean Energy Advisor to Indigenous communities. Lumos provides trusted, qualified, and expert advice to First Nations, Métis and Inuit leaders and communities to finalize participation and partnerships in hydro, solar, wind, biomass, community energy planning, geothermal, and transmission projects.

Lumos Energy has catalyzed Indigenous clean energy projects in almost all of Canada's provinces and territories. Chiefs and Councils, Tribal Groups and Aboriginal Economic Development Corporations seek out Lumos Energy's innovative clean energy services for community energy planning, and business-oriented advice for project partnership negotiations and financing, including economic development strategies with impact.

MEET THE PROJECT TEAM

Grant Sullivan – Executive Director, Gwich'in Council International (Project Lead)

Grant is a recognized policy leader in clean energy sector with years of experience in both the private and public sectors. He excels at transcending the boundaries between the business community and Indigenous governments in the Arctic. Born and raised in Inuvik and currently residing in Whitehorse, Grant holds a Bachelor of Management with a Minor in Finance from the University of Lethbridge (Alberta, Canada). He currently is the Executive Director of Gwich'in Council International, which represents Gwich'in in the Northwest Territories, Yukon, and Alaska in the Arctic Council, helping to give Giwch'in a voice in Circumpolar policy discussions concerning sustainable development and the environment.

As a proud Gwich'in beneficiary, Grant has been an active member of the governing Gwich'in institutions. He has been the Chair of the Gwichi'in Settlement Corporation, which oversees over $140 million in assets; Board Representative and Lead Business Representative of the Nihtat Gwich'in Development Board; and was an active participant in the Gwich'in/Imperial Oil Access and Benefit Negotiations for the Mackenzie Valley Pipeline. He has also been the Financial Controller at the Beaufort Delta Health and Social Services.

Grant's focus on clean energy is motivated by his first hand experience of witnessing climate change on the land, mountains, and rivers, and the impact that these changes are having on traditional lifestyles. He believes that by implementing clean energy initiatives to meet energy needs, can benefit both the environment and the community.

He is currently the co-lead of the Arctic Remote Energy Networks Academy Project pursued by the Arctic Council's Sustainable Development Working Group and is a graduate of the 2020 Catalyst Program.

Chris Henderson – President, Lumos Energy (Project Manager)

Chris Henderson is Canada's pre-eminent Clean Energy Advisor to Aboriginal communities. He advises Chiefs and Councils, Tribal Groups and Aboriginal Economic Development Corporations on how to effectively secure and leverage partnership positions in clean energy projects across Canada. Chris also guides utilities, financial firms, corporations and governments on engaging and partnering with Aboriginal communities. Chris has catalyzed clean energy projects in every Canadian province and territory. His book, Aboriginal Power, was published in 2013.

Chris' professional pursuit with Lumos Energy represents an explicit recognition that the world is changing: bringing Indigenous communities into the mainstream of economic activity, from a vantage point of sustainable development, has the potential to generate a diverse array of economic, social and environmental benefits for all stakeholders

Chris is Program Director and Lead Mentor with the Indigenous Clean Energy: 20/20 Catalysts Program, a major Lumos initiative strengthening First Nations, Metis and Inuit clean energy Community Readiness, Community Capacity and Leadership Skills.

For the past 25 years, Chris has been a Canadian eco-entrepreneur, community leader, and environmental innovator. He has been at the forefront of ground-breaking local and national Canadian business, social, and ecological initiatives that have had local and global impact. Prior to leading Lumos Energy, Chris was Co-Founder and CEO of The Delphi Group. Currently, Chris also serves as: Board Chair of the Globe Series of Conferences; Member of the Editorial Board of the Energy Exchange Magazine; Managing Director of the EXCEL Partnership; and, Ambassador for the Arctic Inspiration Prize.

Chris lives in Ottawa with his family, where he is active with local environmental, renewable energy, and affordable housing causes.

Chris is an honorary member of several Aboriginal communities. In Inuktitut he is called “Tall Chris”, and has been given the names “Lightning” and “Point of the Spear” by Prairie Cree Nations. The most fitting of his Aboriginal names may be the one given to him by the Boreal Ojibwe which translates as “On Indian Time”.

TOOLKIT DRAFT TABLE OF CONTENTS

Below is the draft outline of what will be covered in the Toolkit.

SECTION 1: INTRODUCTION

Disclaimer and Copyright
Forward
Information is Power
The Importance of Forming Networks
How to Use the Toolkit
Toolkit Structure

SECTION 2: CHOOSING YOUR ENERGY FUTURES TEAM

Introduction: Picking the right team
Roles & Structures
Energy Team Composition
Roles of Key People on your Energy Futures Team
Roles of Experts & Advisors on your Energy Futures Team
Technical Experts for Energy Baseline
Arctic Sustainable Energy Futures Toolkit Support Team
Arctic Sustainable Energy Futures Toolkit Advisory Group

SECTION 3: IDENTIFYING YOUR ENERGY LANDSCAPE

Introduction: Importance of Examining your energy
Community Energy Baselining
Collect and Transcribe Energy Records
Conduct Residential Audits
Conduct Infrastructure Audits
Community Energy Needs Assessment
Community Energy Production
Community Energy Consumption
Determine Energy Breakdown
Create Community Energy Consumption Benchmark
Identifying Energy Efficiency, Conservation, Renewable Energy Opportunities
Quantify Savings from Efficiency and Conservation Measures
Cost Analysis from Efficiency and Conservation Measures
Prioritize Efficiency & Conservation Measures
Changing Consumer Energy Habits
Final Report & Projections

SECTION 4: COMMUNITY ENERGY EDUCATION

Introduction: Energy Education for all Ages
Sustainable Energy Opportunities
Wind Energy Generation
Solar Energy Generation
Biomass Energy Generation
Hydro Energy Generation
Natural Gas Energy Generation
Diesel Energy Generation
Smart Grid Technology
Energy Storage Technology
Energy Efficiency & Conservation Opportunities
New Builds & Retrofits
Hands-on Energy Education Tools & Resources
List of 5-10 Different Techniques
Energy Education Videos & Handouts
List of 5-10 Different Techniques
Other Energy Education Tools & Resources
List of 5-10 Different Techniques

SECTION 5: COMMUNITY ENERGY VISIONING & GOAL SETTING

Introduction: Creating your Community Vision
Vision & Mission
Short, Medium & Long-term Objectives
Creating Supportive Governance Models
Council-level
Community-level
Utility-level
Between Communities
Between other political groups
Describe the Rationale of Undertaking this Process
Describe the Impact & Benefits of Undertaking this Process
Environmental Benefits
Climate Change, Community Resilience & Adaptation
Social Benefits
Economic Benefits
Prioritizing Sustainable Energy Initiatives

SECTION 6: COMMUNITY ENGAGEMENT

Introduction: Community Engagement at Every Stage of the Project
Hosting a Community Energy Visioning Session
Energy Mapping
List of 10- 15 Different Community Engagement Techniques
Town Hall Meeting
One-on-One Meetings
Workshops
Local & Social Media
Establishing a Community Energy Committee
Sustainable Energy Charrettes
Gathering & Managing Community Engagement Information

SECTION 7: ENGAGING DECISION MAKERS & PARTNERS

Introduction: Collaborating with Others
Why engage decision makers & partners?
When to engage decision makers & partners?
How to engage decision makers & partners?

SECTION 8: OPTIONS ASSESSMENT

Introduction: Picking the Right Solutions for your Community
Project Pathways
Project Pre-feasibility
Project Feasibility
Project Construction
Project O & M

SECTION 9: IMPLEMENTATION

Introduction: Turning Words into Action
Value Proposition for Implementing your plan
Integrating your plan into Community Strategic Plans & Policies
Integrating your plan into Budgeting Processes
Estimating Costs & Determining Funding Sources
Assessing and Reducing Risk
Budget Needs
Budget Management
Create Community Employment Plan
Goals & Agreements Identified for all Parties
Clear Roles & Responsibilities of all Parties
Impact Projections for all Actions Proposed in your plan

SECTION 10: MONITORING & REPORTING

Introduction: Continuous Reviewing
Key Performance Indicators
Energy and GHG Inventories
Track Actions Completed

SECTION 11: ARCTIC SUSTAINABLE ENERGY FUTURES TOOLKIT CHECKLIST

SECTION 12: ENERGY TERMS & ACRONYMS

SECTION 13: WORKSHEETS & APPENDICES

Helpful Websites
Funding Opportunities
Organizational Support
Community Energy Planning Case Studies (throughout the toolkit)
Basic Energy Calculations
Worksheets & Resources

PROJECT PLAN

Project Phases

The project will process in three phases.

Phase 1

Creation of the Arctic Sustainable Energy Futures Toolkit

This toolkit will be a step-by-step learning guide to help communities develop their own energy planning process. The toolkit will be made available to communities in print and through an interactive web-based platform, and presented in workshop format at regional energy fora.

Phase 2

Development of six to eight Sustainable Energy Futures Plans

Using the Arctic Sustainable Energy Futures Toolkit as a guide, communities will create their own Sustainable Energy Futures Plan. The toolkit will also be buttressed with an introductory toolkit workshop, webinar, and other support mechanisms throughout the energy planning process.

Phase 3

Implementation of Sustainable Energy Futures Plans

Communities will engage with energy entities and all levels of government throughout the development of their Sustainable Energy Futures Plans. Through these meetings, there will be discussions around funding and resourcing opportunities. Secondary support mechanisms will be required for successful implementation of these Sustainable Energy Futures Plans.

Project Tasks

Tasks to complete the toolkit include:

Task 1

Background Research

A large amount of background research and resource gathering (case studies, best practices, and worksheets, hands-on activities) will be required to create a Toolkit that is useful and applicable to all communities across the Arctic. With Member State and Permanent Participant input, a project team will conduct much of this work to ensure the applicability and relevance of resources and outcomes. Members of the project team have been identified by GCI, on the Canadian side, but should be designated by other partners. Through the design phase of the Toolkit, the project team will review the community energy planning resources of all eight Arctic nations and other relevant regions. Overall management of the project is the responsibility of GCI, which is committed to maintaining continuous and ongoing dialogue with project team, SDWG and energy subject matter experts.

Task 2

Toolkit Prototype Development (Print & Web-based)

After the initial research and resource gathering is completed, the print and web-based prototype for the toolkit will be delivered to SDWG for review.

Task 3

Engage with Stakeholders with Prototype

The development of the Toolkit will be an open and transparent process. During the prototype design phase, the project team will engage with multiple stakeholder groups including communities, utilities, governments, CEP practitioners, and others to ensure their feedback is incorporated.

There will be a 3-stage engagement process. Firstly, we shall engage the potential toolkit users (communities) to discuss the use, evaluation, and implementation of the Toolkit. We will also discuss the applicability of the Toolkit's web-based platform. Secondly, we shall engage the local utilities and governments to discuss the strategic alignment of the Toolkit with long-term energy directives for the regions. Thirdly, we will engage other CEP professionals to discuss best practices, tools, and case studies that can be utilized or added to the prototype toolkit.

As part of our iterative design process, the project team will maintain ongoing dialogue with these stakeholder groups as the prototype evolves. Feedback from each engagement process will be synthesized into the pre-existing prototype to help improve the Toolkit. Through this extensive engagement process, stakeholder groups will feel a sense of ownership over this project, which makes it more likely to succeed.

Task 4

Beta Test Toolkit with two Communities

Before the official toolkit launch in six to eight Arctic communities, the project team will conduct a beta test of the Toolkit in two communities. After the beta test, refinements will be made to the Toolkit before its dissemination. At each step, SDWG will be consulted and State input incorporated.

Task 5

Dissemination Toolkit to Arctic Communities

The print and wed-based toolkit will be designed, and hardcopy versions will be printed and distributed to all Heads of Delegation of the SDWG for final approval. Extensive outreach and marketing via partner networks will be done to promote the Toolkit to communities across the Arctic.

Task 6

Launch Toolkit Training Workshops, Webinars and Support Mechanisms

As part of the dissemination phase of the project, the project team will host a one-day facilitated workshop on using the ASEF Toolkit. This workshop will be designed for community members who will be leading the creation and implementation of their community's Sustainable Energy Futures Plan. Workshop presentations and discussions will be recorded for future use by communities. In addition, the project will organize at least two webinars on topics related to the Toolkit, and offer continued support while communities develop their Sustainable Energy Futures Plan.

Timeline

The Figure to the right illustrates the project timeline with the project anticipated to launch in fall 2017 and run for a two-year period, coinciding with the timeline of the Finnish Chairmanship of the Arctic Council.

BUDGET

The total budget for the project is $500,000.

Task	Fee (CAD)
Project Lead	75,000
Project Manager	65,000
Project Coordinator	65,000
Meeting Logistics	105,000
Travel	150,000
Web-Based Platform Development	25,000
Toolkit Design and Printing	15,000
Total	500,000

FOR MORE INFORMATION

WWW.GWICHINCOUNCIL.COM