2019/20 Annual Report

ARCTIC ENERGY ALLIANCE

Contents

Table of abbreviations

AEA	Arctic Energy Alliance
EPA	Environmental Protection Agency
EEIP	Energy Efficiency Incentive Program
GNWT	Government of the Northwest Territories
LCELF	Low Carbon Economy Leadership Fund
NRCan	Natural Resources Canada
NWT	Northwest Territories

Foreword

For 23 years, the Arctic Energy Alliance—or AEA for short—has been leading the North in taking action on climate change. And we're proud to lead that charge.

It was a huge year for us: it was the first of four years in which we will receive a total of $9 million in additional funding. This new funding comes from the governments of Canada and the Northwest Territories through the Low Carbon Economy Leadership Fund. It is allowing us to provide more rebates, bigger rebates and new initiatives to help more people save energy, save money and reduce their carbon footprints.

We have already seen a significant impact from this new funding. In the 2019/20 fiscal year we gave out nearly double the number of rebates from the previous year. And those extra rebates were worth an additional $973,000 compared to 2018/19—a 150% increase.

Collectively, the clients we worked with this year will save 2,500 MWh of electricity annually, which is like taking two small NWT communities entirely off the grid. They will also reduce their carbon footprint by about 1,400 tonnes a year—equivalent to converting Wekweeti's power generation entirely to renewable electricity.

Helen Oudzi and Edward Oudzi, read about AEA program information at an open house session in Colville Lake.

Of course, our work is about much more than simply providing rebates and tracking savings. It's also about building relationships whenever we can so that we can do our part to help people understand how to best take action on lowering their energy bills and fighting climate change. Like when we partnered with 15 organizations—businesses, non-profits and community governments—to upgrade their lighting to energy-efficient LEDs. Or with seven NWT communities to install new, efficient, code-compliant wood stoves for residents.

Typically when we run a community wood stove project we have completed half of a two-year project each year. This year, like last year, we completed the second half of one project and the first half of another. We were able to do this, first and foremost, because of our additional funding. But the fact that we were able to complete two separate portions of our community wood stove projects speaks to the demand that exists in the territory. It means our work makes a difference.

With increased funding and high demand for our services, this fiscal year has been a challenge for our staff. But it's one that we have welcomed and embraced. We look forward to doing even more to make the NWT a cleaner, more energy efficient place to live.

Mark Heyck
Executive Director

2019/20 at a glance

This was a big year for the AEA. We significantly ramped up our programs and other initiatives, giving out 631 more rebates than last year and taking on several new—and sometimes large—special projects.

The increase in rebates was seen across all of our programs. It was especially noticeable in the Energy Efficiency Incentive Program, which offers rebates to Northerners who purchase energy-efficient products such as wood stoves, LED light bulbs and ENERGY STAR® certified refrigerators. This could be due in part to a greater demand this year for energy-efficient products. It could also be related to the increased number of products under the program this year. However, the average rebate under this program was larger than it was last year, indicating that people are making larger individual purchases of energy-efficient equipment.

Like the Energy Efficiency Incentive Program, our other incentive-based programs were busier than last year, giving out 38 more rebates in total—a 55 percent increase. These programs, which cover commercial and community-based clients as well as residents who install renewable energy systems, cover much larger purchases and projects than the Energy Efficiency Incentive Program does. So each rebate indicates a fair amount of work for the client, their contractors and the AEA.

Many of the special projects we took on this year are laying the groundwork for the years to come. These include community energy planning, community energy profiles and contractor outreach. Our additional funding also meant that we could run a project specifically for lower-income homeowners.

For a more in-depth understanding of our programs and services, be sure to read on.

Elye and Louise at the AEA's booth at the Northwest Territories Association of Communities AGM in Inuvik.

Overall results[1]

Programs and Projects		
Number of programs		**11**
Number of special projects		**7**
Incentives		
Total incentives	Including Energy Efficiency Incentive Program (EEIP)	1,613
	Excluding EEIP	347
Total value of incentives	Including EEIP	$1,900,000
	Excluding EEIP	$1,500,000
Average incentive	Including EEIP	$1,200
	Excluding EEIP	$4,200
Payback*		
Total capital cost		$5,900,000
Estimated annual savings		$1,300,000
Simple payback	Before incentives	4.5 years
	After incentives	3.1 years
Energy Savings		
Estimated annual electricity savings		2,500 MWh
Equivalent to taking 2 small NWT communities off the grid		
Estimated power demand avoided[2]		850 kW
Equivalent to 190 electric water heaters running at the same time—at 4,500 W each		
Annual fossil fuel consumption avoided (oil and propane)*		8,000 GJ
Equivalent to 140,000 L of heating oil—enough to fill 4 typical tanker trucks		
Rebate cost per kWh avoided		$0.64
Greenhouse Gas Reduction		
Estimated annual greenhouse gases avoided		1,400 tonnes
Equivalent to converting the power generation for the community of Wekweeti entirely to renewable electricity		
Rebate cost per tonne of greenhouse gases avoided		$1,300

**Not counting fuel used for community-level electricity generation.*

[1] *Throughout this report, numbers greater than nine and those with decimals have been rounded to two significant digits, unless otherwise noted—except for the number of rebates provided and energy audits/evaluations completed, which are presented accurately. In some cases, numbers may not add up correctly due to rounding.*

[2] *Power demand refers to the maximum amount of electricity that is used at any given time.*

Highlights

The following are just a few of the highlights from our programs and projects over the past year.

Programs

Energy Efficiency Incentive Program

Provides rebates on energy-efficient appliances and other products.

- Provided 1,266 rebates.
- LED lighting continues to be the most popular eligible product, with 385 rebates—181 more than last year.
- Combined, the energy-efficient products purchased will save the NWT 700 tonnes of greenhouse gases annually—more than any other AEA program this year.

Energy Rating Service Support Program

Provides home energy evaluations and advice.

- Completed 150 home energy evaluations (down 19 percent over last year).
- Performed evaluations on 107 new homes (up 4 percent over last year).
- Combined, all recommended upgrades could save homeowners $34,000 and 160 tonnes of greenhouse gas emissions a year.

Deep Home Energy Retrofit Program

Provides rebates on major home energy-efficiency upgrades, such as exterior wall insulation, windows and heating equipment.

- New program for 2019/20.
- Completed 46 home energy evaluations, and provided seven final rebates worth $35,000, plus an additional three interim rebates valued at $16,000. The interim projects will be finalized next year.
- Combined, our seven clients with completed projects are expected to save 140 GJ of heating fuel a year—equivalent to bringing one of these homes to net zero (offsetting all energy for heating, hot water and electricity).

Commercial Energy Conservation and Efficiency Program

Provides building energy audits and rebates to NWT businesses to make upgrades to conserve energy and improve their energy efficiency.

- Provided 49 rebates (up 58 percent over last year).
- Combined, annual electricity consumption avoided by all clients' projects is roughly the amount of annual electricity used in the community of Sachs Harbour.
- The average client project will pay for itself through energy savings in less than two years.

Community Government Building Energy Retrofit Program

Provides building energy audits, rebates and project coordination to help community governments across the NWT better manage their energy use.

- Distributed approximately $220,000 in rebates in five communities (up 290 percent over last year).
- Completed 22 desktop "yardstick" building energy audits and 19 on-site "targeted" building energy audits in four communities.
- Energy audits identified more than $340,000 in potential annual savings.

Non-Profit Energy Efficiency and Conservation Program

Provides building energy audits and rebates to NWT non-profit organizations to make upgrades to conserve energy and improve their energy efficiency.

- New program for 2019/20.
- Distributed 11 rebates valued at approximately $130,000.
- Combined, all client projects will avoid 190 kW in power demand—equivalent to running 158 dishwashers at the same time.

Specified Income Home Winterization Program

Provides homeowners with the supplies, knowledge and other resources to winterize their homes, as well as with means to reduce the consumption of electricity and water.

- Worked with six partner communities to hire and train local liaison workers.
- Hosted educational workshops for lower-income homeowners in all six communities.
- Distributed 120 energy efficiency kits to workshop participants.

Alternative Energy Technologies Program

Provides incentives for NWT residents, businesses and community-based organizations to adopt renewable and alternative energy systems, such as solar, wind, wood and more.

- Provided 30 rebates (2 fewer than last year).
- The 30 systems that our clients installed are expected to save roughly 260 tonnes of greenhouse gases a year.
- The average system is expected to pay for itself in just over four years.

Biomass Energy Program

Provides northerners with accessible technical advice on existing or potential biomass projects.

- Started pre-feasibility analyses for six communities on district heating systems. Two of these have already been completed.
- Helped a client apply for a rebate on a relatively large biomass heating system.

Community Wood Stove Program

Provides homeowners with new, efficient wood stoves through partnerships with community organizations.

- Completed one two-year project that began in 2018/19, and began a new project.
- Coordinated the installation of 54 stoves in four partner communities and arranged for 66 additional stoves to be delivered to five communities.
- Combined, all installed stoves will save 2,400 kg of particulate emissions (an 89% decrease) and 9.6 tonnes of greenhouse gas emissions a year.

Community engagement

Community engagement, through all six AEA offices, allows the AEA to keep a close connection to communities throughout the NWT.

- Each office is involved in every program and project the AEA undertakes, and AEA staff attend trade shows, events and other community engagement activities in every NWT community.

Special projects

Community energy planning

Started initial planning for the project and recruitment of a Community Energy Planning Coordinator so that planning exercises with partner communities can begin next year.

Community energy profiles

Collected and analyzed data to build an updated energy profile for 32 of the 33 communities in the NWT.

Contractor outreach project

Created an internal database of all known trades contractors in the NWT, formed partnerships with key organizations and held a contractor training session on pumps with electronically commutated motors.

Guide for energy efficient buildings

Created an updated guide to help organizations issue requests for proposals when looking to construct new, energy-efficient buildings.

LED fast-track project

Helped 15 organizations—businesses, non-profits and community governments—switch to efficient LED lighting, which involved issuing rebates and providing free project coordination services.

Shining Lights: Energy Literacy and Language in the NWT

Partnered with the Centre for Indigenous Environmental Resources and Pembina Institute to develop and deliver workshops in Fort Simpson, Inuvik and Yellowknife—primarily aimed at Indigenous women and youth. Also held energy fairs in conjunction with the workshops.

Tlicho LED fixture retrofit project

Partnered with the Tlicho Government to replace 2-pin and 4-pin compact fluorescent fixtures in privately-owned homes in all four Tlicho communities.

Elye speaks with youth during Waste Reduction Week in Inuvik.

Budget[3]

Source	Funding	Expenses	
		Operations	Incentives
Government of the Northwest Territories (GNWT) base & core program funding	**$ 2,740,000**	**$ 2,262,000**	**$ 387,000**
Base funding for Regional Office Program, administrative staff, offices, etc.	$ 1,600,000	$ 1,763,000	$ 0
Alternative Energy Technologies Program	$ 300,000	$ 54,000	$ 81,000
Biomass Energy Program	$ 100,000	$ 73,000	$ 0
Commercial Energy Conservation and Efficiency Program	$ 200,000	$ 79,000	$ 105,000
Community Government Building Energy Retrofit Program	$ 190,000	$ 101,000	$ 41,000
Energy Efficiency Incentive Program	$ 200,000	$ 42,000	$ 160,000
Energy Rating Services Support Program	$ 150,000	$ 150,000	$ 0
GNWT Low Carbon Economy Leadership Fund supplementary project funding	**$ 1,340,000**	**$ 341,000**	**$ 1,078,000**
Alternative Energy Technologies Program – LCELF top-up	$ 400,000	$ 58,000	$ 305,000
Commercial Energy Conservation and Efficiency Program – LCELF top-up	$ 460,000	$ 86,000	$ 329,000
Community Government Building Energy Retrofit Program – LCELF top-up	$ 170,000	$ 56,000	$ 180,000
Energy Efficiency Incentive Program – LCELF top-up	$ 310,000	$ 141,000	$ 264,000
GNWT Low Carbon Economy Leadership Fund new project funding	**$ 1,500,000**	**$ 454,000**	**$ 411,000**
Deep Home Energy Retrofit Program	$ 350,000	$ 133,000	$ 51,000
Specified Income Home Winterization Program	$ 320,000	$ 120,000	$ 0
Non-Profit Energy Efficiency and Conservation Program	$ 300,000	$ 61,000	$ 134,000
Electric Heating Incentive, South Slave Region	$ 100,000	$ 34,000	$ 0
Community Energy Planning and Implementation	$ 230,000	$ 2,000	$ 0
Community Wood Stove Program	$ 200,000	$ 104,000	$ 226,000
GNWT – Anti-poverty funding	**$ 42,000**	**$ 1,000**	**$ 41,000**
Specified Income Home Winterization Program	$ 42,000	$ 1,000	$ 41,000
Membership dues	**$ 218,000**	**$ 218,000**	**$ 0**
Government of the Northwest Territories	$ 150,000	$ 150,000	$ 0
GNWT – Crown Corporations	$ 63,000	$ 63,000	$ 0
Other	$ 5,000	$ 5,000	$ 0
Other source income	**$ 73,000**	**$ 58,000**	**$ 0**
TOTAL	**$ 5,913,000**	**$ 3,333,000**	**$ 1,917,000**

[3] Numbers are rounded to the nearest thousand, and may not add up correctly due to rounding. Some programs were under or over budget, so in some cases funding was moved between programs for operations and incentives.

Introduction

About the Arctic Energy Alliance

The Arctic Energy Alliance (AEA) is a not-for-profit society, based in the Northwest Territories (NWT), that helps northerners find ways to conserve energy, become more energy efficient, and adopt alternative and renewable sources of energy. All of this leads toward reducing the North's carbon footprint, while saving our clients some money in the process.

The AEA was formed in 1997 to consolidate the activities of several organizations with an interest in energy. The intent was to eliminate duplication and overlap between the various departments and agencies, to provide a single point of contact for the public, and to allow for a more coordinated approach to public education and the delivery of energy conservation services.

Over the past 23 years, the scope of our work has grown substantially. Today, we help residents, businesses, non-profit organizations, community governments and Indigenous governments all across the NWT to lower energy costs, improve building efficiencies and comfort, reduce greenhouse gas emissions, and more. We have become the leading northern organization in bringing together communities, consumers, producers, regulators and policymakers to reduce the cost and environmental impacts of energy use in the NWT.

In fact, bringing people together is an important part of how we operate. Forming partnerships is at the core of our work, whether establishing official community partnerships on an individual project or building and strengthening relationships with vendors, contractors and clients across the territory every day.

With our main office in Yellowknife, five regional offices across the Northwest Territories and 23 staff members, we touch every community in the NWT.

Thanks to generous funding from the governments of the Northwest Territories and Canada, we offer a suite of core programs focused on energy efficiency and conservation, building evaluations, and alternative and renewable energy sources. We also conduct a range of energy-related special projects, devised by AEA staff, which are typically more short-term in nature.

This report highlights our programs and projects from the 2019/20 fiscal year, including their results, so our readers can see the impact we have made.

Mark presents Yellowknife resident Jackie Hardy with a prize in the AEA's ENERGY STAR Day contest.

Charting our course

An overview of our strategic plan

The Arctic Energy Alliance's strategic plan shapes where we want to go and what we want to achieve as an organization. It defines everything we do. So understanding the core of our strategic plan—our vision, mission, goals, objectives and values—will provide context on the programs and projects we do and the results we achieve.

Our vision: *our ultimate goal*

NWT society will become a global leader in clean, efficient, sustainable energy practices.

Our mission: *why we exist*

To promote and facilitate the adoption of efficient and renewable energy practices by all members of NWT society.

Our goals: *what we will achieve*

1. Members of NWT society will know more about the costs and environmental impacts of their energy use.
2. Members of NWT society will want to reduce costs and environmental impacts of their energy use.
3. Members of NWT society will adopt efficient, renewable and carbon-neutral energy practices.
4. Members of NWT society will know the Arctic Energy Alliance as the best place to go when they want to adopt efficient, renewable and carbon-neutral energy practices.
5. Members of NWT society will achieve significant reductions in the costs and environmental impacts of their energy use.
6. Members of NWT society will be celebrated as leaders in efficient, renewable and carbon-neutral energy practices.

Our objectives: *how we will achieve our goals*

1. **Provide services that cover all energy sectors of NWT society:** To expand programs to ensure all sectors of NWT energy use are covered; ensure complete coverage outside of Yellowknife and expand coverage of industry and transportation.
2. **Learn continuously:** To increase Arctic Energy Alliance's own capacity as the "go-to place" for efficient, renewable and carbon-neutral energy practices in the NWT.
3. **Inform:** To provide top-quality information and advice on efficient, renewable and carbon-neutral energy practices accessible to all members of NWT society.
4. **Motivate and support an increasing number of clients to act:**
   a. *Identify and remove barriers*: To identify and work with our partners to remove barriers to the adoption of efficient, renewable and carbon-neutral energy practices.
   b. *Analyze costs and benefits*: To enable the delivery of top-quality energy audits and pre-feasibility studies to those who are contemplating taking action in NWT society.
   c. *Provide incentives*: To research, design and provide effective incentives (financial and other) that motivate NWT society to adopt efficient, renewable and carbon-neutral energy practices.
   d. *Advise on policies and regulations*: To research and advise our partners on effective policies and regulations that would motivate NWT society to adopt efficient, renewable and carbon-neutral energy practices.

e. *Prompt and follow-up with clients*: To encourage NWT society to adopt efficient, renewable and carbon-neutral energy practices.

f. *Champion and recognize success*: To work with and monitor specific clients as "case studies" to efficient, renewable and carbon-neutral energy practices.

5. **Integrate:** To transfer established efficient, renewable and carbon-neutral energy practices into the institutions of NWT society.

Our values: *how we operate*

Mutual respect

We show genuine concern for each other, our clients and others, treating them with understanding and appreciation through fairness, equality and healthy dialogue. We listen carefully to what people say, remain open to all suggestions and questions, and respect others' points of view.

Service and partnership

We believe that the most important way to achieve our vision is through partnerships. We view all our clients as potential partners and are dedicated to ensuring they get top-quality service.

Learning

We are committed to continuous improvement. We build on good ideas, learn from our experiences and challenge ourselves and the status quo.

Results

We have a clear vision of where we're going and how to get there. We focus our resources to achieve our objectives.

Honesty and integrity

We say what we believe and we lead by example.

Positive work environment

We take pride in our professional work ethic, our "can-do" attitude and our informal and flexible work environment. We recognize a job well done.

High-quality work

We are dedicated to detail. We strive to provide top-quality and unbiased advice, based on solid, science-based research. We review each other's work to make sure we get things right.

Tom presents at a home winterization workshop in Fort Resolution.

Core programs

A significant amount of the work we do is tied to 11 core programs that are directly funded by the Government of the Northwest Territories (GNWT) Department of Infrastructure, as well as through the Government of Canada's Low Carbon Economy Leadership Fund.

These programs provide a range of services and support to residents, businesses, community governments, Indigenous governments and non-profit organizations throughout the territory.

The 11 programs can be grouped into three categories: energy efficiency and conservation, renewable and alternative energy, and regional offices.

Energy efficiency and conservation programs

Reducing energy use and using that energy efficiently are the easiest and most cost-effective ways to reduce greenhouse gas emissions and lower energy bills. This is why the AEA has seven programs geared toward energy efficiency and conservation across the Northwest Territories.

Energy Efficiency Incentive Program

The Energy Efficiency Incentive Program provides rebates on the purchase of new, energy-efficient appliances and other products, with the goal of reducing energy costs and greenhouse gas emissions by conserving or reducing energy use.

In recent years, a significant addition to the program has been our partnership with the North West Company to offer in-store rebates at Northern and Northmart stores in several communities. Initially, these rebates were on LED bulbs. In 2019, we expanded the partnership to also offer instant rebates on ENERGY STAR certified refrigerators, washers and chest freezers. By removing the rebate application forms and processing the rebates at the till, we are able to make it even easier for customers to purchase energy-efficient products.

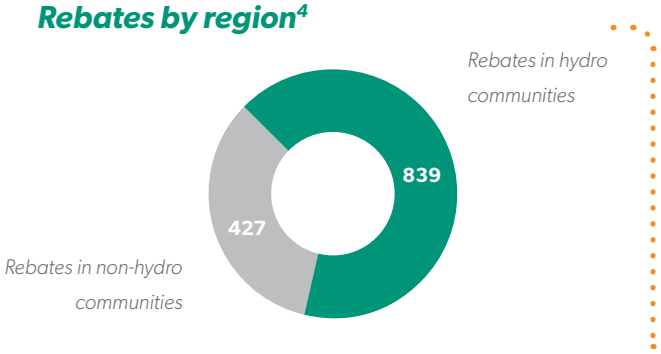
Results

1,266 total rebates

total value of rebates **$430,000**

$340
average rebate

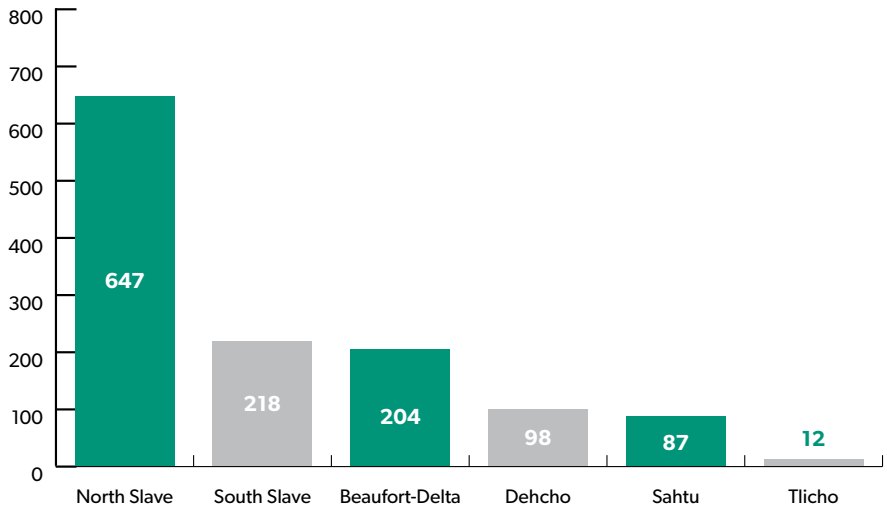
Rebates by region[4]



FOR
residents, businesses, non-profit organizations, Indigenous governments, community governments

AEA FUNDING
$510,000 (from GNWT Department of Infrastructure and Government of Canada)

[4] Hydro communities are those communities that receive most of their electricity from hydroelectric generators. This includes Behchoko, Dettah, Enterprise, Fort Smith, Hay River, Katlodeeche, Ndilo and Yellowknife. All other communities in the NWT are "non-hydro," which receive most of their electricity from generators that burn fossil fuels.



Rebates by type

385	LED lighting
218	Washers
148	Chest freezers
127	Refrigerators
126	Wood and pellet stoves
68	On-demand water heaters
49	Furnaces
40	Insulation
37	Programmable thermostats
37	ECM pumps
26	Boilers
3	Ventless dryers
2	Drain water heat recovery

Payback

Capital cost (all products, before rebates):

$2,400,000

Estimated annual savings (all products):

$410,000

Simple payback (all products, after rebates):

4.9 years

Greenhouse gases

Annual greenhouse gases avoided: **700** tonnes

(equivalent to the greenhouse gases produced by 300,000L of gasoline[5])

Rebate cost per tonne reduced: **$610**

Energy savings

Annual electricity consumption avoided:

1,000,000 kWh

(more than the electricity consumed each year in the community of Enterprise)

Rebate cost per kWh avoided: **$0.42**

Annual fossil fuel consumption avoided (oil and propane): **5,200** GJ

(equivalent to the energy in 280 cords of wood)

Greenhouse gas and energy savings in hydro communities

Several communities in the NWT use hydroelectricity, including Behchoko, Dettah, Enterprise, Fort Smith, Hay River, Katlodeeche, Ndilo and Yellowknife. All other communities in the territory burn fossil fuels to create electricity.

In both hydro and non-hydro communities, saving electricity can help you lower your power bill. In a non-hydro community, it also means reducing greenhouse gas emissions because less fossil fuel has to be burned to create that power. Hydroelectricity, on the other hand, does not create greenhouse gas emissions. So saving electricity in a hydro community does not have associated greenhouse gas reductions.

Across the NWT, most households and organizations burn fossil fuels for space heating. Switching to a more efficient heating system, or to a less carbon-intensive fuel source such as wood, can help you directly reduce your greenhouse gas emissions—even in a hydro community.

For these reasons, you will see throughout this report that, in some cases, greenhouse gas savings are low in hydro communities, even though electricity savings are high. In other cases, greenhouse gas savings are relatively high because of improvements or efficiencies related to space heating.

[5] *https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator*

Greenhouse gas and energy savings by community

Community	No. of rebates	Annual GHGs avoided (tonnes)	Rebate cost/tonne of GHGs reduced	Annual electricity consumption avoided (kWh)	Rebate cost/kWh avoided	Annual fossil fuel consumption avoided/ increased (GJ)
Aklavik	12	4	$ 180	7,400	$ 0.10	↑ 22
Behchoko*	8	1	$ 4,400	14,000	$ 0.33	↑ 6
Deline	21	9	$ 260	16,000	$ 0.15	↑ 39
Dettah*	1	0	-	84	$ 2.40	0
Fort Good Hope	11	6	$ 340	8,900	$ 0.22	↑ 17
Fort Liard	12	4	$ 130	7,500	$ 0.07	↑ 23
Fort McPherson	49	11	$ 830	15,000	$ 0.63	↓ 7
Fort Providence	17	8	$ 380	6,300	$ 0.49	↓ 48
Fort Resolution*	3	2	$ 610	3,100	$ 0.41	↓ 31
Fort Simpson	82	47	$ 410	41,000	$ 0.47	↓ 260
Fort Smith*	21	16	$ 660	9,500	$ 1.10	↓ 200
Hay River*	172	150	$ 510	110,000	$ 0.69	↓ 1,700
Inuvik	96	55	$ 1,300	98,000	$ 0.50	↑ 45
Katlodeeche*	4	1	$ 500	3,200	$ 0.28	↓ 17
Lutsel K'e	1	3	$ 390	5,400	$ 0.23	↑ 17
Nahanni Butte	1	2	$ 460	0	-	↓ 22
Norman Wells	36	20	$ 370	25,000	$ 0.30	↓ 88
Paulatuk	16	4	$ 410	7,700	$ 0.23	↑ 20
Sambaa K'e	2	1	$ 540	870	$ 0.46	↓ 1
Tsiigehtchic	4	0.3	$ 1,500	480	$ 0.87	↑ 1
Tuktoyaktuk	13	5	$ 130	8,900	$ 0.06	↑ 27
Tulita	19	7	$ 320	12,500	$ 0.17	↑ 37
Ulukhaktok	14	6	$ 70	10,000	$ 0.04	↑ 30
Wekweeti	1	1	$ 590	780	$ 0.51	↓ 1
Whati	3	2	$ 600	2,300	$ 0.51	↓ 3
Wrigley	1	2	$ 310	0	-	↓ 22
Yellowknife*	630	290	$ 830	600,000	$ 0.40	↓ 2,700
Remote	16	47	$ 320	16,000	$ 0.94	↓ 360

**Hydro community*

Greenhouse gas and energy savings by region

Region	No. of rebates	Annual GHGs avoided (tonnes)	Rebate cost/tonne of GHGs reduced	Annual electricity consumption avoided (kWh)	Rebate cost/kWh avoided	Annual fossil fuel consumption avoided/ increased (GJ)
Beaufort–Delta	204	85	$ 480	150,000	$ 0.28	↑ 140
Dehcho	98	55	$ 390	49,000	$ 0.43	↓ 280
North Slave	647	340	$ 760	620,000	$ 0.41	↓ 3,000
Sahtu	87	41	$ 330	62,000	$ 0.22	↑ 5
South Slave	218	180	$ 520	140,000	$ 0.68	↓ 2,000
Tlicho	12	4	$ 1,700	17,000	$ 0.37	↓ 2

Greenhouse gas and energy savings by hydro vs. non-hydro communities

Community type	No. of rebates	Annual GHGs avoided (tonnes)	Rebate cost/tonne of GHGs reduced	Annual electricity consumption avoided (kWh)	Rebate cost/kWh avoided	Annual fossil fuel consumption avoided (GJ)
Hydro	839	460	$ 730	740,000	$ 0.45	4,600
Non-hydro	427	240	$ 400	290,000	$ 0.33	540

LED light bulbs at the Northern store in Paulatuk, which are available for point-of-sale rebates thanks to a partnerhip with the North West Company.

Energy Rating Services Support Program

The Energy Rating Services Support Program provides homeowners across the NWT with access to affordable home energy evaluations.

The AEA's registered energy advisors evaluate new and existing homes under licence with Natural Resources Canada (NRCan). Using NRCan's EnerGuide Rating System for homes, the AEA can provide a measure of a home's performance according to a national standard. An evaluation also provides a homeowner with a detailed list of potential upgrades to use less energy.

In addition to conducting home evaluations, the AEA provides free, unbiased home energy efficiency advice to NWT homeowners. We also develop working partnerships with contractors and builders to increase their knowledge of residential energy efficiency, and how to create a healthy balance between envelope air tightness and adequate ventilation.

Results

43 evaluations of existing homes

6 walk-through advice sessions in existing homes

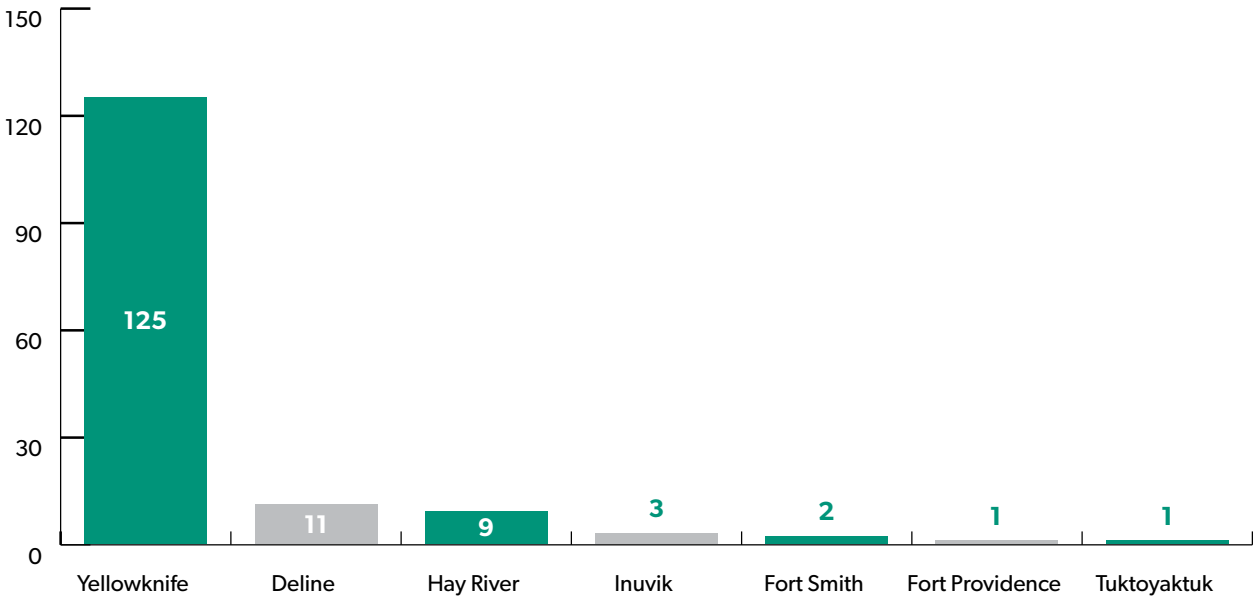
107 evaluations of new homes

150 total evaluations
(plus 6 walk-through sessions)

FOR
residents

AEA FUNDING
$150,000 (from GNWT Department of Infrastructure) + fee for service

Total evaluations by community



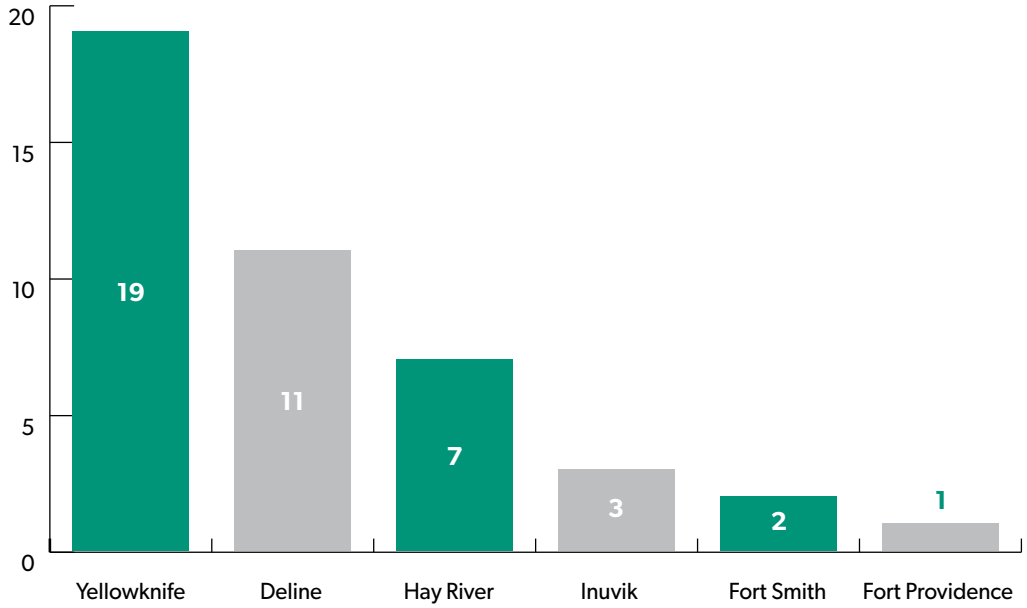
Existing homes

For existing homes, the Arctic Energy Alliance provides two types of evaluations:

- Pre-retrofit: conducted before implementing energy-saving upgrades
- Post-retrofit: conducted after a homeowner implements recommended upgrades

Pre-retrofit evaluations

total pre-retrofit evaluations: **43**



Post-retrofit evaluations

total post-retrofit evaluations: **0**

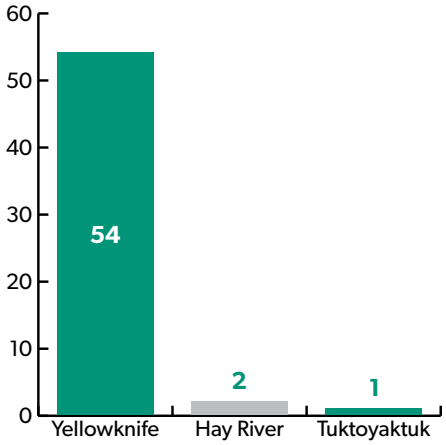
New homes

The AEA provides two types of evaluations for new home construction:

- Blueprint: conducted using building plans to calculate the expected energy use of a new home
- New home final: conducted when construction is complete

Blueprint evaluations

total blueprint evaluations: **57**



New home final evaluations

total new home final evaluations: **50**

All new home final evaluations were done in Yellowknife.

Payback[6,7]

Potential annual savings (all existing homes):

$34,000

Greenhouse gases[7]

Potential annual greenhouse gases avoided: **160** tonnes

(equivalent to replacing more than 3,000 incandescent light bulbs with LED bulbs in an average non-hydro NWT community)

Energy savings[7]

Potential annual electricity consumption avoided:

100,000 kWh

(equivalent to the electricity needed to run a 3,000-W clothes dryer for 33 hours)

Potential annual fossil fuel consumption avoided: **1,500** GJ

(equivalent to 39,000 L of heating oil—enough to fill nearly 2,000 20-L jerry cans)

Scott and Ken set up a blower door as part of an energy evaluation.

[6] Estimated capital costs are unknown, as the AEA does not ask for quotes on its recommended upgrades for homes.

[7] These numbers represent the estimated annual savings in money, greenhouse gases and energy that would result if all homeowners who had pre-retrofit evaluations done were to complete all of the AEA's recommended upgrades. Actual savings can be measured with a post-retrofit evaluation, but comparatively few homeowners choose to complete this process.

New home evaluations are not included in these numbers. Although new homes can be energy efficient, they cannot be considered to save energy unless they replace an older home.

Potential greenhouse gas and energy savings by community

Community	Potential annual GHGs avoided (tonnes)	Potential annual electricity consumption avoided (kWh)	Potential annual fossil fuel consumption avoided/increased (GJ)
Deline	45	31,000	↓ 300
Fort Providence	4.4	5,600	↑ 8.9
Fort Smith*	2.9	6,100	↓ 19
Hay River*	16	1,800	↓ 200
Inuvik	11	6,000	↓ 130
Yellowknife*	74	54,000	↓ 800

**Hydro community*

Potential greenhouse gas and energy savings by region

Region	Potential annual GHGs avoided (tonnes)	Potential annual electricity consumption avoided (kWh)	Potential annual fossil fuel consumption avoided (GJ)
Beaufort–Delta	11	6,000	130
North Slave	74	54,000	800
Sahtu	45	31,000	300
South Slave	23	14,000	210

Potential greenhouse gas and energy savings by hydro vs. non-hydro communities

Community type	Potential annual GHGs avoided (tonnes)	Potential annual electricity consumption avoided (kWh)	Potential annual fossil fuel consumption avoided (GJ)
Hydro	93	62,000	1,000
Non-hydro	60	42,000	420

Deep Home Energy Retrofit Program

The Deep Home Energy Retrofit Program provides rebates to help owners of older, less energy-efficient homes reduce the costs and greenhouse gas emissions associated with heating. These rebates can help homeowners offset the costs of upgrading their insulation, windows, air sealing and heating systems.

The program allows homeowners to undertake more extensive upgrades than they might otherwise consider. Results are measured by conducting EnerGuide home evaluations before and after the upgrades.

Unlike other AEA programs, participants who complete an exterior wall insulation upgrade, and who plan to complete additional upgrades, are eligible for an interim rebate when their wall insulation has been installed. The final rebate is issued when all upgrades are complete.

FOR

residents, businesses, non-profit organizations, Indigenous governments, community governments

AEA FUNDING

$350,000 (from GNWT Department of Infrastructure and Government of Canada)

Results

Home energy evaluations

pre-retrofit evaluations: **46** (in 5 communities)

post-retrofit evaluations: **7**

Completed projects

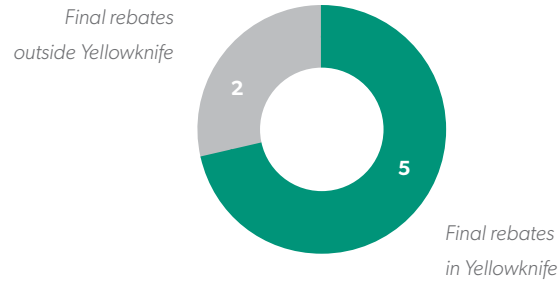
10 total rebates *(7 final plus 3 interim)*

total value of rebates: **$51,000**

- final rebates: **$35,000**
- interim rebates: **$16,000**

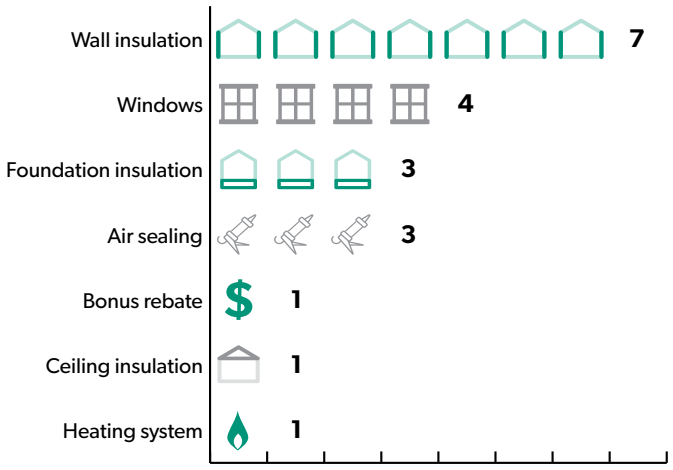
average final rebate: **$5,000**

Communities



communities receiving rebates: **3**

Rebates by type



Payback[8]

Capital cost (all projects, before rebates):

$160,000

Estimated annual savings: **$6,400**

Simple payback (after rebates): **19** years

[8] *All payback and savings numbers are based on final rebates only.*

Greenhouse gases

Annual greenhouse gases avoided: **11** tonnes

(equivalent to the greenhouse gases produced by 4,700 L of gasoline)[9]

Rebate cost per tonne reduced: **$3,200**

Energy savings

Annual electricity consumption avoided: **6,300** kWh

(equivalent to the power consumed by a coffee maker, at 1,000 W, running for 6 hours and 18 minutes)

Rebate cost per kWh avoided: **$5.50**

Annual fossil fuel consumption avoided (oil and propane): **140** GJ

(equivalent to 5,300 L of propane—enough to fill more than 300 propane cylinders for home barbecues)

Greenhouse gas and energy savings by community

Community	No. of rebates	Annual GHGs avoided (tonnes)	Rebate cost/tonne of GHGs reduced	Annual electricity consumption avoided (kWh)	Rebate cost/kWh avoided	Annual fossil fuel consumption avoided (GJ)
Fort Simpson	1	0.19	$6,300	17	$71	3.0
Hay River*	1	3.7	$2,400	1,700	$5.20	33
Yellowknife*	5	6.8	$3,600	4,500	$5.40	100

**Hydro community*

Greenhouse gas and energy savings by region

Region	No. of rebates	Annual GHGs avoided (tonnes)	Rebate cost/tonne of GHGs reduced	Annual electricity consumption avoided (kWh)	Rebate cost/kWh avoided	Annual fossil fuel consumption avoided (GJ)
Dehcho	1	0.19	$6,300	17	$71	3.0
North Slave	5	6.8	$3,600	4,500	$5.40	100
South Slave	1	3.7	$2,400	1,700	$5.20	33

Greenhouse gas and energy savings by hydro vs. non-hydro communities

Community type	No. of rebates	Annual GHGs avoided (tonnes)	Rebate cost/tonne of GHGs reduced	Annual electricity consumption avoided (kWh)	Rebate cost/kWh avoided	Annual fossil fuel consumption avoided (GJ)
Hydro	6	11	$3,200	6,300	$5.30	140
Non-hydro	1	0.19	$6,300	17	$71	3.0

[9] *https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator*

Commercial Energy Conservation and Efficiency Program

The Commercial Energy Conservation and Efficiency Program provides rebates to NWT businesses that make upgrades to conserve energy and improve their energy efficiency. The program is open to businesses both on-grid and off-grid.

Through this program, the AEA also offers businesses building energy audits to find the greatest savings in energy, greenhouse gases and money. If a business wants to investigate potential savings before taking on a project, the first step is to conduct a desktop "yardstick" audit, which analyzes utility bill data. Next would be an on-site "targeted" audit, in which an AEA Energy Management Specialist will evaluate a building in person.

FOR
businesses

AEA FUNDING
$660,000 (from GNWT Department of Infrastructure and Government of Canada)

Results

Audits

Building energy audits completed:

11 yardstick audits *(in 4 communities)*

4 targeted audits *(in 2 communities)*

The targeted energy audits identified roughly $47,000 in combined potential annual savings on energy bills and 39 tonnes of potential annual greenhouse gas savings.

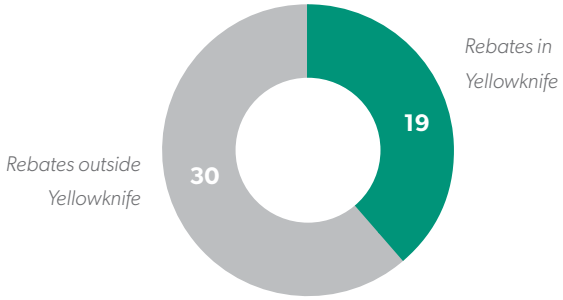
Completed projects

49 total rebates

total value of rebates **$440,000**

$8,900
average rebate

Communities



Communities receiving rebates: **11**

Payback

Capital cost (all projects, before rebates):

$1,000,000

Estimated annual savings (all projects):

$330,000

Simple payback (all projects, after rebates):

1.9 years

Greenhouse gases

Annual greenhouse gases avoided: **210** tonnes

(equivalent to the greenhouse gases emitted by roughly 8,600 propane tanks for home barbecues—if laid side by side, they would stretch for more than 2.5 km)

Rebate cost per tonne reduced: **$2,000**

[10] *https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator*

Energy savings

Annual electricity consumption avoided:
740,000 kWh
(roughly the amount of electricity used annually in the community of Sachs Harbour)

Rebate cost per kWh avoided: **$0.59**

Power demand avoided: **220** kW
(equivalent to running 730 blenders at the same time)

Annual fossil fuel consumption increase (oil and propane): **440** GJ
(equivalent to 11,000 L of heating oil, or enough to fill more than two commercial oil tanks at 4,550-L [1,000-gallons] each)

Greenhouse gas and energy savings by community

Community	No. of rebates	Annual GHGs avoided/ increased (tonnes)	Rebate cost/ tonne of GHGs reduced	Annual electricity consumption avoided (kWh)	Rebate cost/ kWh avoided	Power demand avoided (kW)	Annual fossil fuel consumption avoided/ increased (GJ)
Aklavik	1	↓ 18	$ 770	35,000	$ 0.41	12	↑ 110
Fort Good Hope	1	↓ 16	$ 720	21,000	$ 0.55	0	0
Fort McPherson	2	↓ 29	$ 910	41,000	$ 0.65	8	↑ 50
Fort Simpson	7	↓ 26	$ 1,300	44,000	$ 0.76	6	↑ 110
Fort Smith*	1	↑ 0.22	-	7,900	$ 0.05	2	↑ 5
Hay River*	12	↑ 42	-	230,000	$ 0.35	63	↑ 770
Inuvik	3	↓ 50	$ 900	60,000	$ 0.74	2	↓ 94
Norman Wells	1	↓ 16	$ 1,600	41,000	$ 0.63	15	↑ 110
Tulita	1	↓ 15	$ 630	19,000	$ 0.49	0	0
Ulukhaktok	1	↓ 15	$ 520	18,000	$ 0.41	0	0
Yellowknife*	19	↓ 59	$ 3,100	220,000	$ 0.82	117	↓ 620

** Hydro community*

Why did oil and propane consumption increase?

Many businesses are converting their lighting to LEDs. LED lights use less electricity than other forms of lighting, but also produce less heat. This means that when the lighting in a building is converted to LEDs, the heating system will have to do a little more work to make up the difference.

The money saved by using less electricity for lighting is often greater than the extra spent on heating fuel. Thirty-five of our clients completed lighting retrofits this year. On average, each of them will save an estimated $4,300 a year, even after taking additional heating fuel into account.

Most of the businesses that converted their lighting this year are located in communities that use hydroelectricity, which does not produce greenhouse gases. Using less hydroelectricity and burning more heating fuel means that greenhouse gas emissions increase slightly. On the other hand, our clients in communities that produce electricity by burning fuel such as diesel, natural gas or propane are both saving money and reducing their overall greenhouse gas emissions.

The AEA promotes energy efficiency, regardless of the energy source, due to the many benefits of energy efficient practices.

Greenhouse gas and energy savings by region

Region	No. of rebates	Annual GHGs avoided/ increased (tonnes)	Rebate cost/ tonne of GHGs reduced	Annual electricity consumption avoided (kWh)	Rebate cost/ kWh avoided	Power demand avoided (kW)	Annual fossil fuel consumption avoided/ increased (GJ)
Beaufort–Delta	7	↓ 110	$ 830	150,000	$ 0.60	21	↑ 70
Dehcho	7	↓ 26	$ 1,300	44,000	$ 0.76	6	↑ 110
North Slave	19	↓ 59	$ 3,100	220,000	$ 0.82	117	↓ 620
Sahtu	3	↓ 47	$ 990	81,000	$ 0.58	15	↑ 110
South Slave	13	↑ 42	-	240,000	$ 0.34	65	↑ 780

Greenhouse gas and energy savings by hydro vs. non-hydro communities

Community type	No. of rebates	Annual GHGs avoided/ increased (tonnes)	Rebate cost/ tonne of GHGs reduced	Annual electricity consumption avoided (kWh)	Rebate cost/ kWh avoided	Power demand avoided (kW)	Annual fossil fuel consumption avoided/ increased (GJ)
Hydro	32	↓ 17	$ 16,000	460,000	$ 0.57	182	↑ 150
Non-hydro	17	↓ 190	$ 940	280,000	$ 0.62	42	↑ 290

Community Government Building Energy Retrofit Program

Through the Community Government Building Energy Retrofit Program, the Arctic Energy Alliance supports community governments across the NWT to better manage their energy use and save money in the process.

FOR
community governments

AEA FUNDING
$437,000 (from GNWT Department of Infrastructure and Government of Canada)

The first step is to conduct a "yardstick" energy audit of community government buildings, which looks at utility bill data. Next is a "targeted" energy audit, in which an AEA Energy Management Specialist will evaluate a building in person. Both of these audits are subsidized by the AEA. They identify ways to save electricity, heating fuel, water, greenhouse gas emissions and money. From there, we help the community government make the recommended changes, including providing rebates and offering project coordination services for a fee.

Results

Audits

Building energy audits completed:

22 yardstick audits *(in 4 communities)*

19 targeted audits *(in 4 communities)*

The targeted energy audits identified more than $340,000 in combined potential savings on energy bills.

Completed projects

10 total rebates *(in 7 communities)*

31 buildings retrofitted by clients

total value of rebates: **$220,000**

average rebate: **$22,000**

Payback

Capital cost (all projects, before rebates):

$600,000

Estimated annual savings: **$300,000**

Simple payback (after rebates): **1.3** years

Greenhouse gases

Annual greenhouse gases avoided: **200** tonnes

(equivalent to taking 43 cars off the road)[11]

Rebate cost per tonne reduced: **$1,100**

Energy savings

Annual electricity consumption avoided: **250,000** kWh

(equivalent to the amount of electricity it would take to run 570 laptop computers 24 hours a day for a year)

Rebate cost per kWh avoided: **$0.87**

Power demand avoided: **110** kW

(equivalent to running nearly 1,300 LED TVs at the same time)

Annual fossil fuel consumption avoided (oil and propane): **670** GJ

(equivalent to 17,000 L of heating oil—or 110 barrels)

Greenhouse gas and energy savings by community

Community	No. of rebates	Annual GHGs avoided (tonnes)	Rebate cost/ tonne of GHGs reduced	Annual electricity consumption avoided (kWh)	Rebate cost/ kWh avoided	Power demand avoided (kW)	Annual fossil fuel consumption avoided/ increased (GJ)
Fort Simpson	3	100	$ 510	96,000	$ 0.54	81	↓ 430
Hay River*	1	20	$ 2,600	68,000	$ 0.73	0	↓ 300
Nahanni Butte	2	36	$ 1,100	30,000	$ 1.40	11	0
Sambaa K'e	1	12	$ 1,300	15,000	$ 1.00	7	0
Tulita	1	16	$ 1,800	25,000	$ 1.19	8	↑ 42
Ulukhaktok	1	10	$ 2,800	13,000	$ 2.00	6	↑ 10
Whati	1	5.9	$ 1,100	7,400	$ 0.84	1	0

** Hydro community*

[11] *https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator*

Greenhouse gas and energy savings by region

Region	No. of rebates	Annual GHGs avoided (tonnes)	Rebate cost/ tonne of GHGs reduced	Annual electricity consumption avoided (kWh)	Rebate cost/ kWh avoided	Power demand avoided (kW)	Annual fossil fuel consumption avoided/ increased (GJ)
Beaufort–Delta	1	10	$ 2,800	13,000	$ 2.00	6	↑ 10
Dehcho	6	150	$ 730	140,000	$ 0.77	99	↓ 430
Sahtu	1	16	$ 1,800	25,000	$ 1.19	8	↑ 42
South Slave	1	20	$ 2,600	68,000	$ 0.73	0	↓ 300
Tlicho	1	5.9	$ 1,100	7,400	$ 0.84	1	0

Greenhouse gas and energy savings by hydro vs. non-hydro communities

Community type	No. of rebates	Annual GHGs avoided (tonnes)	Rebate cost/ tonne of GHGs reduced	Annual electricity consumption avoided (kWh)	Rebate cost/ kWh avoided	Power demand avoided (kW)	Annual fossil fuel consumption avoided(GJ)
Hydro	1	20	$ 2,600	68,000	$ 0.73	0	300
Non-hydro	9	180	$ 940	190,000	$ 0.92	110	370

Progress to date

Since the AEA's targeted work with community governments began…

- 25 of the 33 community governments in the NWT have had targeted energy audits done by the AEA on most or all of their buildings.
- All of the community governments in the Tlicho territory and the Dehcho region have had audits completed.
- 16 NWT community governments have accessed or applied for funding to implement their recommended energy management opportunities. Most have accessed funding for more than one building or project in more than one year.
- 15 community governments have used the AEA's project coordination services to help them complete their projects.
- 60% of the community governments that have had targeted energy audits completed by the AEA have received a rebate and/or project coordination services from us to implement some of the audit recommendations.

The importance of project coordination

One of the services that the AEA offers through its Community Government Building Energy Retrofit Program is project coordination. It's an important facet of the program. Community governments have limited resources, especially in the smaller communities, and administrative staff can be pulled in many directions at once. Taking on a building energy retrofit can be a big job; if community government staff were to handle project coordination duties, it could add to an already substantial workload.

That's why the AEA offers this service. We can help our clients determine which energy upgrades to make, determine the technical specifications, issue requests for proposals, select contractors, draft contracts and ensure the work is being done according to specifications.

More than anything, this offers our clients peace of mind, as evidenced by the fact that 15 of the 25 community governments that have used this program have also used our project coordination service. And considering we offer a $10,000 subsidy, it's easy to take advantage.

While we regularly offer project coordination through our community government program, we also offer it through some of our special projects. For example, our LED fast-track project (see page 44) and Tlicho LED fixture retrofit project (see page 45) offered services similar to those we offer community governments. And our Community Wood Stove Program regularly includes coordination services to get stoves ordered, delivered and installed.

Helping people save energy and money isn't always as simple as providing a rebate. Without effective project coordination in place, many of these projects couldn't happen. So we're happy we can offer our clients a way to make those projects a reality.

Non-Profit Energy Efficiency and Conservation Program

The Non-Profit Energy Efficiency and Conservation Program was new for the 2019/20 fiscal year. It provides rebates to non-profit organizations that make energy-efficient upgrades to their buildings, similar to the programs for businesses and community governments.

Under this program, non-profits can also take advantage of building energy audits.

FOR
non-profit organizations

AEA FUNDING
$300,000 (from GNWT Department of Infrastructure and Government of Canada)

Results

Audits

Building energy audits completed:

5 yardstick audits *(in 2 communities)*

1 targeted audit

The targeted energy audit identified roughly $25,000 in potential annual savings on energy bills and 30 tonnes of potential annual greenhouse gas savings.

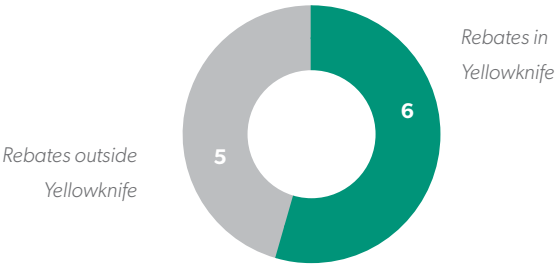
Completed projects

11 total rebates

total value of rebates: **$130,000**

average rebate: **$12,000**

Communities



Communities receiving rebates: **5**

Energy savings

Annual electricity consumption avoided:
320,000 kWh
(equivalent to running a 4,000-W clothes dryer 24 hours a day for 9 years)

Rebate cost per kWh avoided: **$0.42**

Power demand avoided: **190** kW
(equivalent to running 158 dishwashers at the same time)

Annual fossil fuel consumption increase (oil and propane): **580** GJ
(equivalent to 15,000 m^3 of natural gas—1 percent of the natural gas used to produce electricity in Norman Wells in 2018)

Payback

Capital cost (all projects, before rebates):
$350,000

Estimated annual savings (all projects):
$79,000

Simple payback (all projects, after rebates):
2.8 years

Greenhouse gases

Annual greenhouse gases increased: **12** tonnes
(can be offset by everyone in the NWT walking 1 km instead of driving)[12]

Rebate cost per tonne reduced: N/A (emissions increased)

Inuvik's Children First Society is one of 11 organizations that received rebates from the AEA's new program for non-profits.

[12] *https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator*

Greenhouse gas and energy savings by community

Community	No. of rebates	Annual GHGs avoided/ increased (tonnes)	Rebate cost/ tonne of GHGs reduced	Annual electricity consumption avoided (kWh)	Rebate cost/ kWh avoided	Power demand avoided (kW)	Annual fossil fuel consumption increased (GJ)
Hay River*	2	↑ 2.8	-	16,000	$ 0.33	5	48
Inuvik	1	↓ 11	$ 1,200	22,000	$ 0.63	8	75
Norman Wells	1	↓ 5.6	$ 2,400	12,000	$ 1.10	4	17
Remote	1	↑ 0.67	-	11,000	$ 0.55	0	10
Yellowknife*	6	↑ 25	-	260,000	$ 0.37	169	430

** Hydro community*

Greenhouse gas and energy savings by region

Region	No. of rebates	Annual GHGs avoided/ increased (tonnes)	Rebate cost/ tonne of GHGs reduced	Annual electricity consumption avoided (kWh)	Rebate cost/ kWh avoided	Power demand avoided (kW)	Annual fossil fuel consumption increased (GJ)
Beaufort–Delta	2	↓ 11	$ 1,900	33,000	$ 0.61	8	85
North Slave	6	↑ 25	-	260,000	$ 0.37	169	430
Sahtu	1	↓ 5.6	$ 2,400	12,000	$ 1.10	4	17
South Slave	2	↑ 2.8	-	16,000	$ 0.33	5	48

Greenhouse gas and energy savings by hydro vs. non-hydro communities

Community type	No. of rebates	Annual GHGs avoided/ increased (tonnes)	Rebate cost/ tonne of GHGs reduced	Annual electricity consumption avoided (kWh)	Rebate cost/ kWh avoided	Power demand avoided (kW)	Annual fossil fuel consumption increased(GJ)
Hydro	8	↑ 28	-	270,000	$ 0.37	170	480
Non-hydro	3	↓ 16	$ 2,100	44,000	$ 0.75	12	100

Specified Income Home Winterization Program

One of the AEA's primary goals is to reduce northerners' energy costs. We have a variety of ways to do that, but we have recognized for some time that lower-income homeowners are one group that we could serve better. With additional funding from the Government of Canada and the GNWT through the Low Carbon Economy Leadership Fund, we were able to start closing that gap.

FOR
residents

AEA FUNDING
$362,000 (from GNWT Department of Infrastructure and Government of Canada)

Winterization is a low-cost, high-impact way to save energy. This program provides homeowners with the supplies, knowledge and other resources to winterize their homes. It also provides LED light bulbs, low-flow showerheads and faucet aerators to reduce the consumption of electricity and water.

Like our Community Wood Stove Program, this program was based on a community partnership model. Six community organizations partnered with us. Each community partner hired a community liaison worker on a temporary contract as a way to ground the project in the community, raise awareness and capacity around winterization and support local employment.

Each liaison worker was trained by the AEA and held a workshop for lower-income homeowners in their community. After each workshop they distributed energy efficiency kits to the participants, which contained the winterization materials, LED bulbs and low-flow fixtures. They also helped ensure the contents of the kits were properly installed in each home.

Results

6 community workshops
120 energy efficiency kits distributed
total value of incentives: **$41,000**
average incentive: **$340**

Myles Erb, a community liaison worker with the Norman Wells Land Corporation, and Tammy Bouclet, a participant in the program, pose with home winterization equipment.

Renewable and alternative energy programs

Replacing fossil fuels with renewable or alternative energy sources can greatly reduce greenhouse gas emissions. The Arctic Energy Alliance has three programs designed to help northerners adopt these technologies.

Alternative Energy Technologies Program

The Alternative Energy Technologies Program provides incentives for northerners to adopt alternative energy systems, such as solar, wind, wood and more. The program is divided into three streams:

- For residents
- For businesses (including off-grid businesses)
- For community-based organizations (including community governments, non-profit organizations and Indigenous governments)

FOR

residents, businesses, non-profit organizations, Indigenous governments, community governments

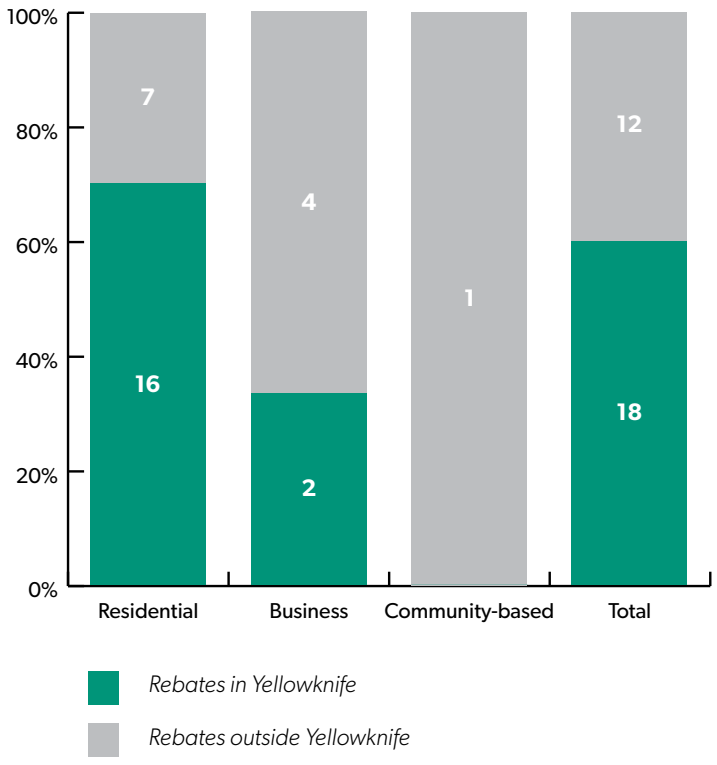
AEA FUNDING

$700,000 (from GNWT Department of Infrastructure and Government of Canada)

Project types

	Residential	Business	Community-based	TOTAL
Solar photo-voltaic	18	3	1	22
Biomass	3	2	0	5
Heat pumps	2	0	0	2
Other	0	1	0	1

Communities



Results

	Residential	Business	Community-based	TOTAL
Total rebates	23	6	1	30
Total value of rebates	$ 225,000	$ 87,000	$ 50,000	$ 360,000
Average rebate	$ 9,800	$ 14,500	$ 50,000	$ 12,000

Payback[13]

	Residential	Business	Community-based	TOTAL
Capital costs *(before rebates)*	$ 460,000	$ 270,000	$ 140,000	$ 870,000
Estimated annual savings	$ 50,000	$ 47,000	$ 28,000	$ 130,000
Simple payback *(after rebates)*	4.7 years	3.8 years	3.4 years	4.1 years

Greenhouse gases

	Residential	Business	Community-based	TOTAL
Annual greenhouse gases avoided (tonnes)	68	180	13	260
Rebate cost per tonne reduced	$ 3,300	$ 480	$ 3,800	$ 1,400

Solar panels on a building in Paulatuk.

Energy savings

	Residential	Business	Community-based	TOTAL
Annual electricity avoided/ produced (kWh)	100,000	21,000	17,000	140,000
Rebate cost/kWh avoided/ produced	$ 2.30	$ 4.20	$ 3.00	$ 2.60
Power demand avoided (kW)	170	150	11	330
Annual fossil fuel consumption avoided (GJ)*	690	2,500	0	3,200

**Does not include fuel savings from solar PV systems*

[13] *These figures are based on estimates used to pre-approve rebate applications, and may not accurately reflect the final systems as installed.*

Combined greenhouse gas and energy savings by community

Community	No. of rebates	Annual GHGs avoided (tonnes)	Rebate cost/ tonne of GHGs reduced	Annual electricity consumption avoided/ produced (kWh)	Rebate cost/kWh avoided/ produced	Power demand avoided/ size of system (kW)	Annual fossil fuel consumption avoided (GJ)†
Fort Good Hope	1	0	-	610	$ 4.30	0.61	0
Fort Simpson	2	170	$ 410	12,000	$ 5.30	120	2,300
Fort Smith*	2	8.9	$ 1,100	6,000	$ 1.70	19	130
Hay River*	2	11	$ 670	3,300	$ 2.20	20	190
Inuvik	3	19	$ 1,900	33,000	$ 1.10	32	0
Lutsel K'e	1	0	-	610	$ 2.70	0.61	0
Paulatuk	1	13	$ 3,800	17,000	$ 3.00	11	0
Yellowknife*	3	41	$ 1,100	28,000	$ 1.70	84	570
Yellowknife area off-grid	15	0	-	36,000	$ 3.90	36	0

** Hydro community*

† Does not include fuel savings from solar PV systems

Combined greenhouse gas and energy savings by region

Region	No. of rebates	Annual GHGs avoided (tonnes)	Rebate cost/ tonne of GHGs reduced	Annual electricity consumption avoided/ produced (kWh)	Rebate cost/kWh avoided/ produced	Power demand avoided/ size of system (kW)	Annual fossil fuel consumption avoided (GJ)*
Beaufort–Delta	4	32	$ 2,700	50,000	$ 1.70	43	0
Dehcho	2	170	$ 410	12,000	$ 5.30	120	2,300
North Slave	18	41	$ 4,600	64,000	$ 2.90	120	570
Sahtu	1	0	-	610	$ 4.30	0.61	0
South Slave	5	20	$ 960	9,900	$ 1.90	40	320

** Does not include fuel savings from solar PV systems*

Combined greenhouse gas and energy savings by hydro vs. non-hydro communities

Community type	No. of rebates	Annual GHGs avoided (tonnes)	Rebate cost/ tonne of GHGs reduced	Annual electricity consumption avoided/ produced (kWh)	Rebate cost/kWh avoided/ produced	Power demand avoided/ size of system (kW)	Annual fossil fuel consumption avoided (GJ)*
Hydro	7	61	$ 1,100	37,000	$ 1.70	120	890
Non-Hydro	23	200	$ 1,500	100,000	$ 3.00	200	2,300

** Does not include fuel savings from solar PV systems*

Biomass Energy Program

Through the Biomass Energy Program, the Arctic Energy Alliance provides northerners with accessible technical advice, project coordination, and education on existing or potential biomass projects. AEA staff also help clients by facilitating the development of partnerships with potential project funders.

There are several ways to use biomass energy, such as biomass heating (for example, a wood-pellet furnace or boiler), co-generation (heat and electricity from the same system) and district heating (using one heat source for several buildings).

In the 2019/20 fiscal year, the AEA worked with seven communities and other organizations to discuss options for installing new systems or expanding existing systems. This included helping one organization access a rebate for a completed system.

FOR

residents, businesses, community governments, Indigenous governments, non-profit organizations

AEA FUNDING

$100,000 (from GNWT Department of Infrastructure)

Pre-feasibility analyses

With biomass heating systems becoming more common across the NWT—and the savings being evident—more and more communities and organizations are looking to biomass for their heating needs.

The community governments of Behchoko, Enterprise, Fort Providence, Gameti, and Jean Marie River have all been in discussion with the AEA in recent years about the possibility of installing new district heating systems on community buildings. In 2019/20, pre-feasibility analyses were started for all of these communities. In the case of Enterprise and Fort Providence, these analyses were completed and the AEA made presentations to the community councils. The remaining analyses will be completed in the 2020/21 fiscal year.

In Whati, the AEA started a pre-feasibility analysis of expanding the existing district heating system to additional buildings in the community. In this case, some of the buildings identified for inclusion belong to other organizations, so the AEA has played a coordinating role between the community government and the other parties.

Completed system

A client in Fort Simpson completed the installation of a relatively large biomass heating system in 2019/20. Leading up to the installation, the AEA helped the client complete a funding application to the GNWT's GHG Grant Program. However, when the GNWT informed the client that some of the project expenses would not be eligible under the program, the AEA helped them complete an application to the Alternative Energy Technologies Program, which was able to provide funding.

Community Wood Stove Program

Under its Community Wood Stove Program, the AEA typically forms a two-year partnership with each participating community, where each partner has designated roles and responsibilities and provides 50 percent of the funding for new stoves. In the first year, the stoves and related materials are purchased and delivered to a community. The second year involves the code-compliant installation of the stoves and related materials in the homes of local residents.

The goals of each project are to:

- increase wood burning safety by supporting code-compliant installations
- reduce particulate emissions in smoke from wood stoves
- increase local capacity around wood harvesting and seasonal local employment
- increase wood burning efficiency by installing EPA-certified wood stoves

FOR
residents

AEA FUNDING
$200,000 (from GNWT Department of Infrastructure and Government of Canada)

Many of the stoves installed under the program are replacements for older, less-efficient stoves—some of which are no longer safe. This means the program may not create a large reduction in greenhouse gas emissions in any given year. However, one of the program's main benefits is that by providing new, more efficient stoves that have been installed according to safety codes, it allows residents to continue to afford to use wood heat instead of switching back to fossil fuels. And the newer stoves burn much more cleanly, improving local air quality.

In 2019/20, the AEA took part in two projects under the program. The first saw the completion of the project begun in 2018/19. The AEA partnered with the Tlicho Government and each of the Tlicho community governments in Behchoko, Gameti, Wekweeti and Whati to install 54 stoves in residents' homes. The stoves were delivered in 2018/19 and were installed in this fiscal year.

The second project saw 42 stoves delivered to Deline, Jean Marie River and Sambaa K'e, as well as another 24 delivered to Whati and Gameti. These will all be installed in the 2020/21 fiscal year.

Results

120 total incentives
2 new stoves installed
52 replacement stoves installed
66 stoves delivered (to be installed in 2020/21)
total value of incentives: **$230,000**
average incentive: **$1,900**

Payback[14]

Capital cost (all projects, before rebates):

$360,000

Estimated annual savings (all projects):

$8,000

Simple payback (all projects, after rebates):

46 years

Greenhouse gases

Annual greenhouse gases avoided: **9.6** tonnes
(equivalent to the CO_2 absorbed by 1.5 hectares of mature Canadian forest)[15]

Incentive cost per tonne reduced (all installed stoves; incentives for purchase, delivery and installation): **$19,000**

Annual particulate emissions reduced:
2,400 kg *(an 89% decrease)*

[14] All numbers for payback, greenhouse gas savings and energy savings include only stoves that have been installed. Capital cost and simple payback include costs and incentives over two fiscal years—for purchase and delivery (year 1), and installation (year 2). The two-year incentives for 54 installed stoves total $180,000.

Energy savings

Annual fossil fuel consumption avoided (oil and propane): **113** GJ

(or 3,000 L of heating oil)

Annual wood savings: **49** cords

Estimated electricity savings not tracked in 2019/20.

Greenhouse gas and energy savings by community

Community	No. of incentives	Annual GHGs avoided (tonnes)	Incentive cost/tonne of GHGs reduced	Annual firewood avoided (cords)	Particulate emissions avoided (kg)	Annual fossil fuel consumption avoided (GJ)
Behchoko*	20	9.6	$ 6,700	9	650	3,000
Gameti	16	0	-	19	820	0
Wekweeti	12	0	-	14	620	0
Whati	6	0	-	7	310	0

** Hydro community*

Greenhouse gas and energy savings by hydro vs. non-hydro communities

Community type	No. of incentives	Annual GHGs avoided (tonnes)	Incentive cost/tonne of GHGs reduced	Annual firewood avoided (cords)	Particulate emissions avoided (kg)	Annual fossil fuel consumption avoided (GJ)
Hydro	20	9.6	$ 6,700	9	650	3,000
Non-hydro	34	0	-	40	1,800	0

Savings from wood stove use

Because the 54 recipients who had stoves installed in 2019/20 are using new, efficient wood stoves, they are estimated to see the following savings each year compared to heating with oil:

- Annual greenhouse gas emissions: **270** tonnes
- Annual fossil fuel consumption: **3,900** GJ
  (or 100,000 L of heating oil)
- Annual heating cost: **$150,000**

[15] *https://www.sfmcanada.org/images/Publications/EN/C02_Sink_EN.pdf*

Building success through partnerships

One of the AEA's core values is that the most important way to achieve our vision is through partnerships. And you can see that value in the work that we do. We take a partnership approach to just about every interaction we have.

Often, those partnerships are informal. We want to empower our clients and help them make decisions that are best for them. But other times we form partnerships in the true sense of the word. This is most easily seen in some of our programs and special projects, such as the Community Wood Stove Program, the Specified Income Home Winterization Program and the Shining Lights workshops.

Creating these formal partnerships can achieve several things. It allows the other organizations to have a strong say in the projects that happen in their communities. It means that we have people involved who know the communities and what they need. And it can even help build local capacity.

Providing rebates and advice are important parts of what we do—they help make change happen. But we believe that partnerships make that change truly meaningful.

Left: A delivery of wood stoves in Deline, waiting for installation.

Opposite: Sheena helps with a ladybug release at the greenhouse in Fort McPherson.

Community engagement

While the Arctic Energy Alliance is well known for its rebate and energy evaluation programs, community engagement is just as important. By engaging with community members, the AEA can provide education and advice, and promote and coordinate our programs across the NWT. When people are energy conscious, they are more likely to adopt efficient and renewable energy practices. Engagement is one of the main tools we use to foster that energy consciousness.

FOR
residents, businesses, community governments, Indigenous governments, non-profit organizations

AEA FUNDING
allocated from $1,600,000 core funding (from GNWT Department of Infrastructure)

The AEA has offices in six communities across the NWT: Fort Simpson, Hay River, Inuvik, Norman Wells, Whati and Yellowknife. These offices allow us to keep a closer connection to the communities throughout the territory. Who better to understand the needs of each region than the people who live there?

Each of the AEA's offices is involved in every program and project that we undertake, but also engage in their own work, unique to each region. In fact, we have a Regional Office Program to coordinate the work of our regional offices, and community engagement is a huge component. One of the main ways we get involved in our communities is through trade shows, events and other community engagement activities. We partner with organizations throughout the NWT to help educate northerners on our programs and the importance of responsible energy use.

The following are highlights from just a few of those activities.

Beaufort–Delta office (Inuvik)

Ladybug release in Fort McPherson

In July the AEA sponsored a ladybug release at the Fort McPherson community greenhouse. Ladybugs help control plant-eating insects without the use of pesticides, which makes them perfect for a greenhouse. The staff from our Inuvik office were on hand to talk to community members about our programs.

We also took the opportunity to speak with the Tetlit Gwich'in Council about our Specified Income Winterization Program. The council would eventually become a community partner in the project. See page 31 for more information.

Waste Reduction Week movie night in Inuvik

In October, the AEA partnered with Ecology North to hold a pizza party and movie night for Inuvik youth at the local youth centre. Part of the event was a discussion on ways to reduce waste in Inuvik and surrounding areas, which led to in-depth conversations involving youth, staff of the youth centre and the mayor.

The movie, of course, was Wall-E.

Northwest Territories Association of Communities annual general meeting in Inuvik

The Northwest Territories Association of Communities (NWTAC) is a non-profit organization that represents the interests of all 33 community governments in the NWT. Its annual general meeting brings together community government representatives, territorial leaders and other interested parties. This makes it an ideal place for the AEA to discuss our community-based programs. Staff from all of our offices attended the 2019/20 AGM to build relationships and talk about not only our community-based programs, but all AEA programs that can benefit community members.

We expect a lot from the AGM every year, but one thing we didn't expect was to receive the NWTAC's Community Service Award. That was quite an honour.

Dehcho office (Fort Simpson)

Aurora College 50th anniversary community lunch in Fort Liard

In June, Fort Liard held a community lunch to celebrate the 50th anniversary of Aurora College. The AEA was on hand to give away treats (cooked in our solar oven) and prizes. As usual, we also engaged with community members about our programs and ways to save energy in general.

Jean Marie River healthy living fair

Community healthy living fairs were started just a few short years ago as an initiative of the Government of the Northwest Territories. They are a way to engage with people in smaller communities across the NWT about a broad range of health-related topics. In 2019, much of the coordination role for the fairs shifted to the individual communities, who would decide what their fairs would look like.

As usual, the fair in Jean Marie River was an excellent opportunity to answer questions and provide energy-related advice and education. It was also a way to let the community know that the AEA's Dehcho office was once again open for business, having had a few months without a Regional Energy Project Coordinator.

Sahtu office (Norman Wells)

Using Energy Wisely open house in Fort Good Hope

In May, the AEA travelled to Fort Good Hope and held an open house session for tenants of the local housing authority. While there, we spoke with residents about home winterization, installing solar electric systems, product rebates and more.

We also took the opportunity to speak with several organizations around the community about the AEA's programs and special projects.

Promoting home energy evaluations in Deline

While home energy evaluations are one of the main services that the AEA offers, travel logistics mean that we aren't able to offer them frequently in the smaller communities. However, when several people in a community have signed up for an evaluation, we can make a trip happen.

Several homeowners in Deline had expressed interest in home energy evaluations, so in August our Sahtu Regional Energy Project Coordinator travelled to the community to further promote the service and get homeowners signed up. We worked with Tim Tutcho to spread the word. Tim is a local Energy Champion under Indigenous Clean Energy's 20/20 Catalysts program, working with the Deline Got'ine Government.

Twelve homeowners signed up for home energy evaluations. Eleven of those evaluations were completed in February 2020.

Normally, homeowners have to pay a subsidized fee for a home energy evaluation. In this case, the homeowners' costs were covered by a program under Natural Resources Canada.

South Slave office (Hay River)

Thebacha Trade Show in Fort Smith

Trade shows and other public events are one of the main ways that we engage with communities around the NWT. With plenty of people in one place, it's easy to answer questions and let the public know about our programs and services.

The Thebacha Trade Show in Fort Smith is one of our regular stops. It's always a well-organized and well-attended event, and a great opportunity to interact face-to-face with the people of Fort Smith. This time, we even brought the AEA's electric bike along for the ride.

The trade show wasn't our only event of the trip. While in the community we also held meetings with the Town of Fort Smith, Aurora College, the library, local First Nations and more. We even managed to squeeze in an open house session and a home winterization workshop.

Gateway Jamboree in Enterprise

The Gateway Jamboree is another regular event on the AEA calendar, bringing in people from a number of South Slave communities. This year we not only set up a booth with information on energy efficiency and home winterization, but also brought along our solar demonstration trailer as a way for participants to charge cell phones and other devices with renewable energy.

Tlicho office (Whati)

Career fair in Behchoko

In April, the AEA travelled to Behchoko for a career fair at Chief Jimmy Bruneau School. The fair was an excellent opportunity to engage with not only students, but also other community members and even members of other Tlicho communities who had travelled for the event. It was a chance to talk about not just our programs and energy efficiency in general, but also about some of the many possible careers related to energy efficiency and renewable energy.

Sustainable living presentations in Behchoko, Gameti and Wekweeti

Being Tlicho, Sonny is very tied to his culture. This is why he has developed sustainable living presentations, based on Indigenous culture, that he delivers in the Tlicho communities. The presentations are typically well-attended, and discuss not just ways to cut energy costs and reduce greenhouse gas emissions, but also the importance of traditional foods and cultural activities.

Tom helps a participant try out the AEA's e-bike at the Gateway Jamboree in Enterprise.

Yellowknife office

Yellowknife Spring Trade Show

The annual Spring Trade Show is one of Yellowknife's biggest engagement events of the year, with hundreds—if not thousands—of attendees. So it goes without saying that it's one of the best opportunities every year for the AEA to speak face-to-face with residents.

Renewable Energy Scavenger Hunt in Yellowknife

Each year, Ecology North organizes and promotes activities for Earth Week in April. The AEA has frequently hosted an event as part of the week. In 2019 we held a scavenger hunt around Yellowknife to see who could find the most renewable energy systems. There were categories for individuals and classrooms, and participants had to find various types of systems including solar panels, biomass heating, wind turbines and more.

Sonny delivers a Burn-it-Smart and sustainable living presentation in Wekweeti.

Special projects

In addition to our core programs, the Arctic Energy Alliance undertakes special projects as opportunities arise. These projects can support residents, businesses, community or Indigenous governments, or non-profit organizations in the NWT.

Over the 2019/20 fiscal year, the AEA conducted seven projects, with funding provided by the GNWT Department of Infrastructure (through its core funding to the AEA and the Low Carbon Economy Leadership Fund), Environment and Climate Change Canada (through the Low Carbon Economy Leadership Fund) and Natural Resources Canada.

Community energy planning

Since the AEA's inception it has engaged with a number of communities around the NWT on community energy planning. The exercise of community energy planning is about identifying and finding ways to implement local solutions to challenges around energy conservation and efficiency. In the process, it also aims to build local capacity and energy literacy.

The last time we worked with communities on local energy plans was as part of a two-year pilot project from 2016 to 2018. With additional funding at our disposal in 2019, we saw an opportunity to not only take on the project again, but to expand it. The Low Carbon Economy Leadership Fund can allow us to help communities implement the plans once they are in place. But for those communities to create their plans in the first place we secured up to three years of funding from Natural Resources Canada through its Clean Energy for Rural and Remote Communities Capacity Building Stream. We intend to start using this funding beginning next fiscal year.

The rest of the 2019/20 fiscal year was used for initial planning and recruiting a Community Energy Planning Coordinator. In 2020/21 we will conduct the planning exercises with partner communities. Part of this process will involve hiring a local energy champion in each of the partner communities to ensure the project is grounded in Indigenous community traditions, and that local governance and protocols are respected. In the subsequent years we can help those communities implement their plans.

Community energy profiles

Community energy profiles are a tool used by organizations such as the AEA, the GNWT, community governments and contractors to show how communities across the NWT are using energy. This includes the costs and amounts of various energy sources (such as petroleum products, wood and electricity), where and how those energy sources are used, and related greenhouse gas emissions. This information is useful so communities can understand their energy use and opportunities for saving energy and money, reducing their environmental footprints and making their communities more sustainable.

For 2003/04, 2007/08 and again for 2014/15, the AEA produced community energy profiles to show how communities across the NWT are using energy.

The 2014/15 update was incomplete due to the AEA's inability to access key data. The AEA saw the need to update these profiles so that the information was current. However, one of the ongoing challenges with producing community energy profiles has been collecting reliable data on heating fuel use.

In 2018/19, AEA staff spent time developing partnerships and initiated a strategy for collecting usable data. In 2019/20, we were able to collect and analyze the data we needed and begin building new profiles.

Contractor outreach project

While the AEA provides rebates, advice and other services related to upgrading the energy efficiency of buildings, it's frequently contractors who do the work to make those upgrades happen. Usually our clients work with contractors, but sometimes we work with them directly. And they're always an important part of the process. So it makes sense for us to build relationships with them. We have always tried to foster such relationships, but in the 2019/20 fiscal year we took some more formalized steps.

The first step was to create an internal database of all known trades contractors in the territory. We can't work with contractors and share information with them if we don't know who they are. We also formed a partnership with the NWT & Nunavut Construction Association and continued our partnership with Aurora College, as venues for sharing information.

Perhaps the largest component of our outreach project for this year was to hold a training course for contractors on electronically commutated motors (ECMs). These motors can be found in energy-efficient pumps and ventilation equipment, but many contractors are not yet familiar with the technology. In 2020/21, the AEA is launching a project to help with rebates and project coordination for organizations that would like to install equipment with ECMs, so it's important that contractors know how they work. The AEA brought up two instructors from the Grundfos Training Group, and 38 contractors from around the NWT attended the session.

Guide for new energy-efficient buildings

When an organization sets out to construct a new building, how can they know they'll get something that will be as energy-efficient as their budget allows? We answered that question in 2013 by publishing a guide for energy-efficient new buildings. But technologies, building codes and building practices have changed since then. So this year we worked with Renu Engineering to publish an updated guide.

The guide is primarily aimed at organizations that will be issuing a request for proposals for the construction of a new building. But it is useful to anyone who would like to know how to make their new building as efficient as possible—whether it's commercial or residential.

LED fast-track project

From our rebate programs and LED projects over the years, we know that there are a lot of organizations across the NWT that have converted to energy-saving LED lighting. But there are still quite a few that have not yet made the switch. Our LED fast-track project aimed to reduce that number by not only offering rebates by also by taking care of the project coordination to make everything happen.

In the end, 15 organizations completed LED upgrades under the project, including businesses, community governments and non-profits. The rebates were given out under their respective programs—for example, rebates for businesses were given out under the Commercial Energy Conservation and Efficiency Program. The cost, energy and greenhouse-gas savings associated with each of those upgrades are incorporated into the sections for those programs in this report.

Shining Lights: Energy Literacy and Language in the NWT

The AEA partnered with the Centre for Indigenous Environmental Resources and Pembina Institute to develop and deliver workshops in Fort Simpson, Inuvik and Yellowknife. Primarily aimed at Indigenous women and youth, the workshops helped participants find ways to reduce their communities' energy footprints, and support personal and community-driven energy goals. A key component was to develop messages about energy awareness in the NWT's Indigenous official languages spoken by the participants. The workshops were well attended in all three communities.

In conjunction with the workshops, the AEA held an energy fair in each of the participating communities. Full of information and activities, the fairs were an additional way for both workshop participants and the community at large to increase their energy knowledge and literacy.

The lights in the arena in Ulukhaktok were replaced under the LED fast-track project.

Tlicho LED fixture retrofit project

In the 2016/17 fiscal year, the AEA swapped roughly 12,000 incandescent and compact fluorescent light bulbs across the territory for more efficient LEDs. However, there are a number of houses across the NWT that used 2-pin and 4-pin compact fluorescent bulbs instead of the more common screw-in type. We were able to swap some of these bulbs for LEDs at the time, but certainly not all.

In 2019/20, we partnered with the Tlicho Government to replace these 2-pin and 4-pin fixtures in privately-owned homes in all four Tlicho communities. The old fixtures would be replaced with screw-in models and fitted with LED bulbs at no cost to the homeowners. This means they would have a greater choice in lighting options.

We identified 573 light fixtures for replacement in Behchoko, Gameti, Wekweeti and Whati. To date, 332 of those have been replaced. The onset of the COVID-19 pandemic put the project on hold and we will resume when it is safe to do so.

Results (fixtures swapped to date)

- Annual electricity savings: 17,000 kWh
- Annual power demand reduction: 8 kW
- Annual cost savings: $5,300
- Annual greenhouse-gas reduction: 11 tonnes

Operations management

The Arctic Energy Alliance uses cash-based cost tracking, accrual accounting, and project resource-loading systems in our operations. Our cash-based project cost planning and tracking system, together with our accounting system, enables project- and ledger-level budgeting and expense tracking. These two systems are linked.

We use timesheet and billing software that includes project setup, budgets, resources assignment, timesheets, and advanced reporting tools. Using this software, each staff member is allocated time for each project and task to which they are assigned. This enables us to plan and report on staff activity at project and task levels.

The AEA has an established financial system including policies, procedures, budgeting and expenditure control. The system requires all expenditures at the project and ledger levels be planned and budgeted for. Once project and ledger-level budgets are loaded into our tracking and accounting software, purchase orders can only be issued if they are budgeted for, and only within prescribed spending thresholds. All purchase orders are electronically generated and are used to track planned, in-progress and actual expenditures against budgeted expenditures.

Salary time expenditures are tracked using our timesheet software and paid using our accounting system. Every two weeks, staff members submit their timesheets to the Executive Director for review and approval. This system restricts staff to only booking time against projects and tasks they are assigned. The approved timesheets are loaded into the accounting system and used to allocate staff costs to projects, and for payment purposes.

The AEA associates individual expenditures to vendors and projects. A single line item amount can be allocated to one or more projects, or the AEA can allocate entire transactions to one or more projects. This provides us the flexibility to provide detailed project-level expenditures such as those provided in our quarterly reporting.

The table on the next page summarizes the outcome of the AEA's work, and the subsequent chart reports the total staff hours dedicated to achieve that outcome.

Louise at the AEA's booth at the Gateway Jamboree in Enterprise.

Impact of AEA programs and projects

Metric	Energy Efficiency Incentive Program	Energy Rating Services Support Program	Deep Home Energy Retrofit Program	Commercial Energy Conservation and Efficiency Program	Community Government Building Energy Retrofit Program	Non-Profit Energy Efficiency and Conservation Program	Specified Income Home Winterization Program	Alternative Energy Technologies Program	Community Wood Stove Program	Total	Percentage of total
Total no. of incentives	1,266	-	7	49	10	11	120	30	120	1,613	100%
No. of incentives in Yellowknife	649	-	5	19	-	6	-	18	-	697	43%
No. of incentives outside Yellowknife	617	-	2	30	10	5	120	12	120	916	57%
Total value of incentives	$430,000	-	$35,000	$440,000	$220,000	$130,000	$41,000	$360,000	$230,000	$1,900,000	-
Average incentive	$340	-	$5,000	$8,900	$22,000	$12,000	$340	$12,000	$1,900	$1,200	-
Total capital cost	$2,400,000	-	$160,000	$1,000,000	$600,000	$350,000	$41,000	$870,000	$460,000‡	$5,900,000	-
Est. annual savings	$410,000	$34,000*	$6,400	$330,000	$300,000	$79,000	-	$130,000	$3,800§	$1,300,000†	-
Est. annual electricity savings (MWh)	1,000	100*	63	740	250	320	-	140	-	2,500†	-
Incentive cost per MWh avoided/ produced	$420	-	$550	$590	$870	$420	-	$2,600	-	$640	-
Estimated power demand avoided/produced (kW)	-	-	-	220	110	190	-	330	-	850	-
Est. annual fossil fuel savings/increase (GJ)	↓ 5,200	↓ 1,500*	↓ 140	↑ 440	↓ 670	↑ 580	-	↓ 3,200	↓ 113§	↓ 8,000†	-
Est. annual greenhouse gases avoided/ increased (tonnes)	↓ 700	↓ 160*	↓ 11	↓ 210	↓ 200	↑ 12	-	↓ 260	↓ 9.6§	↓ 1,400†	-
Incentive cost per tonne of greenhouse gas emissions reduced	$610	-	$3,200	$2,000	$1,000	-	-	$1,400	$19,000§	$1,300	-
Total no. of desktop energy evaluations (blueprint and yardstick evaluations)	-	57	-	11	22	5	-	-	-	95	100%
No. of desktop energy evaluations in Yellowknife	-	54	-	7	-	1	-	-	-	62	65%
No. of desktop energy evaluations outside Yellowknife	-	3	-	4	22	4	-	-	-	33	35%
Total no. of on-site energy evaluations	-	93	53	4	19	1	-	-	-	170	100%
No. of on-site energy evaluations in Yellowknife	-	69	25	3	-	-	-	-	-	97	57%
No. of on-site energy evaluations outside Yellowknife	-	24	28	1	19	1	-	-	-	73	43%

** Potential savings only. Actual savings could not be accurately measured.*

† Not including potential savings.

‡ Capital cost from 2019/20 fiscal year. Does not match two-year capital cost from page 36.

§ Installed stoves only.

Staff hours by program/project*

7,810	Regional Offices Program
6,380	Administration
4,150	Professional Development and Delivery Support
2,240	Energy Rating Services Support Program
1,890	Energy Efficiency Incentive Program
1,670	Commercial Energy Conservation and Efficiency Program
1,510	Communications
1,400	Community Government Building Energy Retrofit Program
1,030	Deep Home Energy Retrofit Program
1,000	Energy Management Program (Buildings and Partnerships)
900	Community Wood Stove Program
690	Specified Income Home Winterization Program
660	Alternative Energy Technologies Program
660	Biomass Energy Program
330	Non-profit Energy Efficiency and Conservation Program
200	South Slave Electric Heat Incentive Program
20	Community Energy Planning
32,550	TOTAL

** Rounded to the nearest 10.*

Financial management

Highlights

Results of operations for the year ending March 31, 2020

- Overall revenues totalled $5.3 million and overall expenses totalled $5.0 million.
- The AEA budgeted for an overall surplus of $170,000 this year, and ended the year with an overall surplus of $310,000, representing 6% of total revenues. This is a 250% increase over the previous year's surplus of $89,000, which represented 2% of total revenues.
- Net financial assets increased $310,000 over the course of the year, compared to a $110,000 increase the previous year.

Key revenues	Value	Increase/ decrease from 2018/19	Comparison to budget
GNWT contributions	$ 5,000,000	↑ 52%	89%
Other source income	$ 98,000	↓ 12%	130%

Key expenses	Value	Increase/ decrease from 2018/19	Comparison to budget
Rebates distributed	$ 1,900,000	↑ 150%	79%
Travel and accommodations	$ 220,000	↑ 29%	82%
Consulting fees	$ 120,000	↓ 46%	96%
Advertising and promotion	$ 73,000	↓ 1%	60%

Financial position at March 31, 2020

Key assets	Value	Increase/ decrease from 2018/19	Primary reasons
Total assets	$ 1,900,000	↓ 20%	Repaid unspent LCELF contributions from 2018/19
Cash and short-term investments	$ 1,100,000	↓ 32%	Greater proportion of funding spent instead of being placed in short-term investments
Accounts receivable	$ 660,000	↑ 7%	

Key liabilities	Value	Increase/ decrease from 2018/19	Primary reasons
Total liabilities	$ 580,000	↓ 57%	Decrease in contributions repayable to the GNWT
Accounts payable and accrued liabilities	$ 390,000	↓ 71%	Decrease in contributions repayable to the GNWT
Deferred revenues	$ 170,000	N/A*	Unspent contributions; related expenses will not be recognized until later period.

** Increase from zero.*

Key net assets	Value	Increase/ decrease from 2018/19	Notes
Total net assets	$ 1,300,000	↑ 31%	
Internally restricted reserves	$ 890,000	↑ 1%	
Unrestricted accumulated surplus	$ 400,000	↑ 300%	Represents accumulated unspent core funding and consulting projects

Cash flow for the year ending March 31, 2020

- Gross cash from operations showed a surplus of $280,000, compared to a surplus of $71,000 the previous year. This is largely due to several expenses that came in under budget.
- There was a net cash flow deficit of $574,000, down 160% over the previous year, largely due to repayment of unspent contributions from the Low Carbon Economy Leadership Fund.

Key cash receipts	Value	Increase/ decrease from 2018/19
GNWT contributions	$ 5,000,000	↑ 16%
Other sources	$ 140,000	↑ 36%

Management discussion and analysis

The Arctic Energy Alliance prudently manages its people and money to deliver quantifiable results in line with the organization's strategic plan. The organization is financially sound, has a three-month operating reserve and can respond to changes in our financial or operating environment quickly and effectively.

As evidenced in this annual report, the Arctic Energy Alliance delivered an outstanding variety and number of public services this year, and was able to do so effectively with the right balance of management and financial controls, thus ensuring an effective and prudent use of public money.

The financial future of the organization is positive because of two principal factors: the cost of heating and electric energy in the Northwest Territories, and the Government of Canada's commitment to addressing the factors underlying climate change. Therefore, demand for the services the organization delivers is expected to remain stable. Combined with the confidence governments have in funding a fiscally and operationally sound organization like the Arctic Energy Alliance, it is reasonable to expect funding stability over the next two to three years. In fact, the AEA saw an increase in funding partway through the 2018/19 fiscal year, which was provided by the Government of Canada and the GNWT through the federal Low Carbon Economy Leadership Fund. In 2019/20 the AEA ramped up its operations to take full advantage of this additional funding, including hiring and training new staff members to increase capacity, adding new programs and project to address areas not covered by existing programs, and increasing incentive amounts to encourage more people to adopt energy-efficient and renewable-energy technologies.

Membership and governance

As at March 31, 2020.

Board of directors

- Rob Sexton, President; Director of Energy, GNWT Department of Infrastructure
- Scott Reid, Vice-President; Director, Northwest Territories Housing Corporation
- Gordon Van Tighem, Treasurer; Chairman, Northwest Territories Public Utility Board
- Mark Heyck, Secretary; Executive Director, Arctic Energy Alliance
- Julian Kanigan, Acting Director, Conservation, Assessment and Monitoring, GNWT Department of Environment and Natural Resources
- Grace Lau-a, Director, Community Operations, GNWT Department of Municipal and Community Affairs
- Sara Brown, Chief Executive Officer, NWT Association of Communities

General members

- GNWT Department of Infrastructure
- GNWT Department of Environment and Natural Resources
- GNWT Department of Municipal and Community Affairs
- NWT Association of Communities
- NWT Housing Corporation
- NWT Public Utilities Board

Sustaining members

- Northland Utilities (Yellowknife) Ltd.
- Northwest Territories Power Corporation

Staff

- Sheena Adams, Program Coordinator
- Ken Baigent, Senior Energy Management Specialist
- John W. Carr, Senior Technical Specialist
- Elye Clarkson, Regional Energy Project Coordinator, Beaufort–Delta
- Kevin Cull, Communications Coordinator
- Naoufal Dahbi, Energy Management Specialist
- Lise Dolen, Regional Energy Project Coordinator, Sahtu
- Scott Dowler, Energy Management Specialist
- Derek Erasmus, Regional Energy Project Coordinator, Dehcho
- Alexandra Giroux, Energy Management Specialist
- Marta Goodwin, Finance and Administrative Assistant
- Mike Goodwin, Energy Management Specialist
- Tom Gross, Project Coordinator
- Barbara Guay, Administrative Assistant
- Mark Heyck, Executive Director
- Faye MacDonald, Office Manager
- Margaret Mahon, Senior Energy Management Specialist
- Leanne Robinson, Energy Management Specialist
- Louise Schumann, Regional Energy Project Coordinator, South Slave
- Craig Thomas, Operations Manager
- Linda Todd, Program Coordinator
- Jennifer Wicks, Human Resources and Program Assistant
- Sonny Zoe, Regional Energy Project Coordinator, Tlicho

"I, Mark Heyck, Executive Director of the Arctic Energy Alliance, duly authorized on behalf of the board of directors of the Arctic Energy Alliance, represent and warrant that this annual report is true and accurate."

Mark Heyck,
Executive Director
September 23, 2020

Several of the Yellowknife staff members attended the youth-organized climate action strike in September.

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The Arctic Energy Alliance is a non-profit, non-government agency whose vision is that "NWT Society will become a global leader in clean, efficient, sustainable energy practices." The Arctic Energy Alliance's mission is to promote and facilitate the adoption of efficient and renewable and energy practices by all members of NWT society.

ARCTIC ENERGY ALLIANCE