

Energy Poverty and an Equitable

Transition to a Net-Zero Carbon Future in Nova Scotia

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EfficiencyOne is based in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq people. We also recognize that African Nova Scotians are a distinct people whose histories, legacies, and contributions have enriched Mi'kma'ki and Nova Scotia for over 400 years. Today, Nova Scotia is home to families who have lived here for generations as well as newly landed immigrants.

This paper is about helping people. It is about assisting those experiencing energy poverty, those who struggle to pay their energy bills while maintaining a basic standard of living. The paper also recognizes the importance of equity in efforts to reduce energy poverty.

For over a decade, EfficiencyOne has been reducing energy poverty in Nova Scotia. We work with service providers and partners who complete energy assessments and energy efficiency upgrades to homes and rental units leading to significant energy bill savings. We have also worked with dozens of non-profit, charitable, and volunteer organizations across the province who also help those in need. They inform people about support services available to them and provide insights to EfficiencyOne on how we can improve the design and delivery of our programs. Our success is dependent on working with these dedicated organizations, businesses, and individuals, and we thank them for their ongoing professionalism, expertise, and support.

Energy poverty can create extreme hardship for those experiencing it. To understand these situations we collaborated with non-profit and charitable groups across the province who work directly with those in need and with those in equity-deserving groups. Throughout this paper you will find "Voices from the Community" inserts, stories that come from these organizations. For their help in telling these important stories and for their ongoing dedication to helping others, we thank:

- Antigonish Emergency Fuel Fund (Antigonish)
- Chebucto Connections (Spryfield)
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- The Lotus Centre (Truro)
- New Dawn Enterprises (Sydney)
- North Preston's Future Community Organization Society (North Preston)
- Nova Scotia League for Equal Opportunities (Hatchet Lake)
- Pictou County Women's Resource and Sexual Assault Centre (New Glasgow)
- Society of Saint Vincent de Paul (Halifax)
- South Shore Open Doors Association (Bridgewater)

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Executive Summary

Energy prices are expected to increase as investments are made to lower greenhouse gas emissions. This will have a disproportionate and, in many cases, significant impact on households experiencing energy poverty. Energy poverty occurs when an individual or household struggles to pay their energy bills while maintaining a basic standard of living. For some, it means deciding whether to buy food or stay warm in the winter. For others, it means consistently living in uncomfortable and unhealthy conditions many people take for granted. Not being able to pay energy bills also leads to ongoing mental stress and a lower quality of life, and for some, living without heat or electricity. An estimated 43% of households in Nova Scotia were experiencing energy poverty as of early December 2023.

The cost of energy, amount of energy used, and household income (or available funds) are the three main factors that influence whether a household experiences energy poverty. There are underlying variables for each of these factors. For example, energy poverty has been found to disproportionately affect individuals and communities in equity-deserving groups. This includes those that have social and financial barriers rooted in discrimination, racism, physical and mental abilities, language, geography, access to education, gender, and age.

Energy poverty can create extreme hardship for those experiencing it. To understand these situations we engaged a variety of communities and organizations and included sections called "Voices from the Community" throughout this paper. These inserts feature stories from those experiencing energy poverty including those in equity-deserving groups. While EfficiencyOne has expertise in the design and delivery of energy efficiency programs, we recognize that we need to listen, learn, and do more to address equity when delivering these programs. The "Voices from the Community" inserts touch on a number of equity related issues, which often overlap with energy poverty.

Nova Scotia is a leader in helping those in energy poverty. This is demonstrated by programs that provide energy upgrades for low-income homeowners, moderate-income homeowners, landlords with tenants of lower income, and Mi'kmaw communities. These programs provide significant energy bill savings to those who need it most. However, as part of the transition to a net-zero carbon future, we know that more needs to be done. To better understand the energy poverty situation in Nova Scotia, we developed a dashboard that allows us to assess energy poverty levels in communities across the province.

Based on our experience and research, EfficiencyOne recommends the following:

- 1. Commit long-term funding to energy efficiency programs for those in energy poverty until at least 2030.
- 2. Monitor and evolve new program offerings.
- 3. Establish a program for moderate-income renters.
- 4. Achieve deeper energy savings.
- 5. Further efforts to address equity by focusing on barriers to initial participation and issues with a building.

These recommendations should be considered by funders, various levels of government, policymakers, utilities, stakeholders, non-profit groups, and ourselves as we continue to transition to a net-zero carbon future.

1. Introduction

Section 1 – Why does a net-zero carbon future need to consider energy poverty and equity?

A net-zero carbon future is imperative. In 2021, EfficiencyOne's White Paper *2050: Net-Zero Carbon Nova Scotia* identified five pathways to net zero. Addressing energy poverty and equity is one of those five. This paper focuses on energy poverty and the relationship between energy poverty and equity.

Over 120 countries have committed to having net-zero economies by 2050. This means they must significantly reduce their level of greenhouse gas emissions while also allowing for carbon offsets (Government of Canada, 2022). Achieving net-zero is a decades long endeavour and requires significant investment as energy systems, buildings, transportation infrastructure, and vehicles will need to be upgraded and transformed. During this transition, energy prices are expected to rise as more polluting fuels are phased out and new infrastructure is built.

Higher energy costs disproportionately impact households with lower incomes. This can lead to serious challenges with some individuals and families struggling to pay their energy bills and keep food on the table. It can also result in unhealthy and uncomfortable living conditions leading to poorer mental and physical health (Riva, et al., 2022), reducing the quality of life for these people. Living in energy poverty means making sacrifices and living with the ongoing burden of not being able to pay energy bills.

Energy poverty is based on three main factors: household income (or funds available), the amount of energy used, and the cost of energy. Each of these factors has their own set of variables that can greatly influence whether someone experiences energy poverty. For example, a sudden job loss or health complication affects disposable income; the efficiency of a building and appliances affects the level of energy use; and global energy prices affect what we pay here in Nova Scotia. Equity is at the heart of many of these variables. Many people and communities have faced discrimination and barriers for years, and this can have a significant impact on numerous factors in their lives, which then influences whether they experience energy poverty. For example, equity can influence on income, housing situations, and physical and mental health. As part of this paper, it is important to recognize that barriers and negative situations exist for many people. Addressing these equitably is essential in reducing energy poverty.

To help understand what it means to be in energy poverty, we collaborated with non-profit, volunteer, and charitable organizations who work with people in need including those in equity-deserving groups. The "Voices from the Community" inserts you will read throughout this paper are meant to enhance an understanding of what it means to be in energy poverty. Figure 1 identifies the organizations who helped tell these stories.

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1. Antigonish Emergency **Fuel Fund** 2. Chebucto Connections 3. Eskasoni Mi'kmaw Nation 4. LEA Place Women's **Resource Centre** 5. The Lotus Centre 6. New Dawn Enterprises 7. Nova Scotia League for Equal Opportunities 8. North Preston's Future **Community Organization** Society 9. Pictou County Women's **Resource and Sexual Assault** Centre 10. Society of Saint Vincent de Paul 11. South Shore Open Doors Association

The purpose of this paper is to help people. To do that, we need a better understanding of the causes of energy poverty, the level experienced in Nova Scotia, and the impacts on individuals and families. The intention is that this paper can be used by a variety of organizations to further their efforts in reducing energy poverty in the province. This includes considering how equity can and should be part of the transition to a net-zero future. In many cases, this means doing more for some individuals and communities so they can achieve lower energy bills. Energy poverty is a complex problem, and energy efficiency upgrades are only one option to help reduce the burden of high energy costs.

Absent support for those in energy poverty, their situations will get worse as energy prices increase. This also means more people will experience energy poverty. Not only does this significantly impact individuals and families across our province, it can also have a negative impact on our society. The good news is that Nova Scotia is already a leader in reducing energy poverty and has been increasing efforts in recent years. This paper presents hopes to build on those efforts.

FIGURE 1. COLLABORATION ON "VOICES FROM THE COMMUNITY" INSERTS

Voices From the Community - Antigonish Emergency Fuel Fund

The Antigonish Emergency Fuel Fund is a charitable organization that began in 2008 when oil prices were skyrocketing. The organization grew out of a community meeting where 200 low-income individuals met to discuss how they would get through the upcoming heating season. Last year alone, the organization supported 200 families by paying a portion of their heating or power bill. In total, 42% of their clients are single-parent families.

"This type of poverty is invisible to the community," notes the Antigonish Emergency Fuel Fund. Homes in rural areas are often in the roughest shape. These can include 50-year-old trailers that have next-to-no insulation in the walls and old farmhouses that are very inefficient. Because they are rural, these problems often go unseen. Compounding the problem is that sometimes the people living there want to remain unseen – they are ashamed and, in some instances, scared of what could happen if their situation came to light.

For example, imagine telling your young daughter not to tell her friends at school about a situation at home because you were afraid of her being taken away. A few years ago in February a small girl was crying in school. The teacher finally figured out what was wrong: there was no heat in the home in the middle of the winter. They had a duty to report this, and child protection services intervened in the interest of the child. The mother was understandably very upset. She had run out of oil and could not afford to buy more. The Antigonish Emergency Fuel Fund provided assistance, and the heat was back on in the home. Situations like these are extremely concerning, and they happen probably more often than is known. Not everyone who needs help asks for it.

Another story involves a senior living alone. One fall, it was discovered she had not had electricity since April. She was using a cooler on the deck as her fridge with a cement block on top to keep the racoons away. She needed help but, for a variety of reasons, did not ask for it.

It is also common for people in old, inefficient, mobile homes to heat only their kitchen and living room. They do this by opening their oven door and turning on the electricity. As they cannot afford the oil bill, they do not heat their bedrooms or the rest of the home. The Antigonish Emergency Fuel Fund estimates about 20% of the population would not be able to make it through the winter without support, and it's especially hard on single mothers. "They are warriors – they get up every day and work hard and try and keep their kids on the straight and narrow."

The local community has been great supporters of the Fund, with donations doubling several times over. "The local radio station has been a great supporter of our cause and people and corporations are responding with donations." Recent support provided to the Provincial Heating Assistance Rebate Program was also a huge help. However, with energy prices remaining high, the need for support remains strong. The Antigonish Emergency Fuel Fund is "determined that this element of poverty, energy poverty, will not be the reason people not able to make it."

2. Energy Poverty

Section 2 – What is energy poverty? How is it measured? What influences energy poverty rates?

Energy poverty occurs when an individual or household struggles to pay their energy bills while maintaining a basic quality of life. The effects of energy poverty vary. Some households experience significant challenges and must make tough decisions such as being able to "heat or eat." Not being able to afford energy can lead to utility disconnections; uncomfortable and unhealthy households; and sacrificing on other essential items. For many people in Nova Scotia, the cost of energy is a significant concern.

Energy poverty is commonly measured as spending more than a certain percentage of one's household income on energy use. For this analysis, it includes all energy used in the household, electricity and fuels for space and water heating as well as electricity for appliances, lighting, and other household needs. It does not include fuel costs for personal transportation (e.g., gasoline for vehicles); however, those costs can also be significant. The paper uses after-tax (rather than before-tax) incomes based on Government of Canada census information to assess the number of Nova Scotians in energy poverty. This represents the funds households have to meet their needs.

The energy poverty threshold used by many organizations is based on census data from Statistics Canada. Their 2016 data showed that 3% of Canadian household income was spent on household energy use. Those spending more than twice that amount (greater than 6%) are defined as being in energy poverty (Rezaei, 2017). This threshold is used by Efficiency Canada and the Canadian Urban Sustainability Practitioners (CUSP) (Kantamneni & Haley, 2022; CUSP, 2019). The Affordable Energy Coalition in Halifax also uses 6% as the threshold for energy poverty. However, they consider after-tax income rather than before-tax income, which is used by Efficiency Canada and CUSP. The Town of Bridgewater used a higher threshold (10% of after-tax income) but also included transportation costs (Gifford, 2022; Town of Bridgewater, 2019). Other jurisdictions have other thresholds for energy poverty some of which also consider the efficiency of the building (Das & Martiskainen, 2022).

Energy poverty is influenced by three main factors: the price of energy, the amount of energy used, and the income (or available funds) of the household.



FIGURE 2. PRIMARY FACTORS THAT INFLUENCE ENERGY POVERTY RATES

A change in any of these factors will influence whether a household experiences energy poverty. Situations such as an unexpected job loss or sudden increase in international energy prices can quickly lead to energy poverty for some people. Conversely, additional income earners being added to the household or a significant reduction in energy use thanks to energy efficiency upgrades can take a household out of energy poverty.

At a deeper level, a number of variables affect these three main factors. For example, the number of people in a household affects the level of energy use. Access to education, personal abilities, and the effects of discrimination, among other variables, can influence income levels. In Canada, those in energy poverty spend more than double the national average on healthcare suggesting they may also have other health and financial challenges (Das & Martiskainen, 2022). This is a key consideration and is a theme that exists in many of the "Voices from the Community" inserts. Individuals and families that experience energy poverty often face a variety of financial challenges, the cost of energy being one of them. Understanding that other circumstances are at play is important to better understanding the root of energy poverty.

2.1 Price of Energy

The price of energy, sometimes influenced by global events, has a significant impact on the number of households in energy poverty. For example, shortly after the COVID-19 pandemic began, the price of US crude oil dropped to \$15.18 per barrel in April 2020, the lowest in decades. Just over two years later, in June 2022, the price rose to \$113.77/barrel, the highest since 2008, as inflation, the war in Ukraine, and other uncertainties impacted the cost (US Energy Information Administration, 2022). Undoubtedly 2022 was a volatile year for energy prices. Furnace oil prices increased by 70% from January 2022 to May 2022 (CBC, 2022). Over a roughly four-year period the price of home heating oil in Nova Scotia shifted significantly; the lowest price (shortly after the COVID pandemic began) rose 2.7 times two years later (see figure 3).



FIGURE 3. FURNACE OIL PRICES IN NOVA SCOTIA (PER LITRE)

Source: NRCan, 2023

Energy poverty can be directly tied to the cost of a commodity. While future energy prices are difficult to predict, increases are anticipated as part of the transition to a net-zero carbon future. In Nova Scotia, higher energy prices in the future are an even bigger burden as Atlantic Canada already has the highest spending on household energy use in the country (Das & Martiskainen, 2022; Riva, Kingunza Makasi, Dufresne, O'Sullivan, & Toth, 2021; CUSP, 2019).

2.2 Amount of Energy Used

The amount of energy used can vary significantly from household to household. There are numerous factors at play including efficiency of the building; its heating, ventilation, and cooling systems; appliances; family size; building size; behavioural patterns; and hobbies. These all influence the amount of energy

Atlantic Canada has the highest spending on household energy use in the country.

used in a home. In a typical Nova Scotia household, most energy is used for space heating followed by water heating, appliances, and then lighting. Generally, energy use is higher in larger and older buildings and in those with more people in the household.

In Alberta it was reported that of all households applying for a program tailored to low- and modestincome households, the average annual energy bill was 33% higher than that of other households. As such, it may be plausible that those living in energy poverty are living in older, less-efficient households (Empower Me, 2019). Another study found that older buildings (built before 1960) and those requiring major repairs, have higher instances of energy poverty (Riva, Kingunza Makasi, Dufresne, O'Sullivan, & Toth, 2021). This trend is also seen internationally as those most burdened by energy poverty often have older and inefficient appliances and buildings (International Energy Agency, 2022).

Spending on energy is also influenced by the type of energy (e.g., home heating oil, propane, natural gas, wood/pellets, electricity). Energy costs by fuel type can vary over time, especially in unregulated markets. As well, the efficiency of heating systems is tied to fuel type. For example, the energy efficiency of oil-heating systems generally peaks at about 85% efficiency. This means that for every litre of oil purchased a maximum of 85% of that is available as heat for the home. The remainder goes up the chimney with the exhaust fumes. On the other end of the spectrum, heat pump technologies provide significant efficiency gains. A home using electricity to run mini-split heat pumps can see efficiencies of roughly 250% meaning that for every unit of electricity purchased, the house realizes 250% worth of heat in the home (Efficiency Nova Scotia, 2023). As such, increasing the efficiency of heating systems influences the level of energy used.

Riva et al. (2021) suggest that energy poverty is directly linked to the ability to improve the energy efficiency of the household (or the level of energy being used). For example, even if the income of a household increases (and they are no longer in poverty), unless they can afford energy efficiency upgrades, they may still experience energy poverty.

2.3 Household Income / Funds

The level of household income is a significant factor in whether someone experiences energy poverty (Ashcroft A. a., 2022). Efficiency Canada has found that low-income households are the most vulnerable. They have the lowest disposable incomes to pay energy bills and/or invest in energy-efficiency upgrades (Kantamneni & Haley, 2022).

There are important differences between being low income and being in energy poverty. The use of the word "poverty" implies that a household is poor. In Canada, the low-income cut-off (LICO) level is often used as the indicator for low-income status. This is set by the federal government and is based on thresholds where a higher proportion of income is spent on shelter, clothing, and food (20 percentage points more than the average family). LICO levels differ by community size (five categories) and family size (seven categories) (Statistics Canada, 2022). In Nova Scotia, 44,075 households are considered low-income as they fall below the levels of after-tax LICO (Statistics Canada, 2022).

While 89% of low-income Nova Scotia homeowners experience energy poverty, only 16% of homeowners experiencing energy poverty are in fact low-income (Gifford, 2022). This suggests that a significant number of people experiencing energy poverty are not low-income. This understanding is further supported by CUSP (2019), who reported that many modest-income households also experience energy poverty, and by a 2018 review in Alberta where two-thirds of the households in energy poverty were not low-income (Kambo Energy Group, 2018).

While low-income households are the most vulnerable, there are still a significant number of people in energy poverty that have a moderate-income level.

2.4 Renters

Efficiency Canada data indicate that tenants paying their own energy bills are the most likely to experience energy poverty (Kantamneni & Haley, 2022). However, if energy poverty is determined based solely on amount spent on energy, tenants with heat and hot water included in their rent, for example, may not be deemed to be in energy poverty. Since energy costs are effectively built into their rent, it is not possible to discern what exactly is spent on energy. Higher energy prices could lead to increases in rent over time as landlords seek to recoup those additional costs. In other cases, as indicated in some of the "Voices from the Community" inserts, landlords may have started to charge separately for heat that was once included in the rent. While there may be nuances to considering renters in the energy poverty metric, it is important to remember they can also be impacted by higher energy costs. In addition, a 2022 report on energy poverty in Bridgewater found that renters were the least comfortable in the winter, and apartments in converted houses had the highest level of energy poverty. Furthermore, renters with utilities included in the rent reported being much more satisfied with the temperature in their apartment in the winter (85%) compared to renters who had to pay their own utilities (62%) (Riva, M; Debanne, L; Bertheussen, M, 2022).

Renters in energy poverty are in an inherently more complex situation and achieving energy bill reductions can be trickier. This is due, in part, to a split-incentive scenario. In situations where the building owner pays the heating bills, the owner has a financial reason to undertake energy efficiency upgrades. However, the renter is less inclined to change their behaviour to keep energy use lower (e.g., ensuring windows stay closed in the winter) because they do not pay for heat. On the other hand, renters who pay for heat want to live in a very efficient space to keep their bills lower, but the building owner has no direct financial benefit from investing in energy efficiency upgrades. Efficiency Canada's report on energy efficiency in rental housing dives much deeper into the complexities and impacts in the rental market. For example, there are interactions between various policies, municipal by-laws, and regulations. These can include rent control, evictions, tenant rights, relocation during renovations, minimum building performance standards, all of which can influence a need or desire to complete energy efficiency upgrades in rental units. The interplays between different policies should be considered when attempting to reduce energy use in rental properties (Kantamneni & Haley, 2023).

Voices From the Community – New Dawn Enterprises

New Dawn Enterprises is a non-profit organization in Cape Breton established in 1976. It provides a variety of services including affordable and low-market housing, immigration settlement, homecare, and affordable arts and community spaces. Their mission is to engage the community to create and support a culture of self-reliance. One program, Meals on Wheels, provides healthy meals to people in Cape Breton Regional Municipality unable to prepare meals for themselves.

Many of the Meals on Wheels clients are seniors or people with disabilities. In some cases, their home needs major repairs: leaking roofs, broken windows, doors that don't close properly, and more. The majority of Meals on Wheels seniors live below the poverty level on a fixed income that doesn't keep up with inflation. For a variety of reasons, Meals on Wheels (which charges a fee based on income) is often the only way for these people to get consistent healthy meals. It is a vital service enabling seniors to live longer in their homes and communities.

New Dawn has worked with seniors who do not have enough money to pay all their expenses. Rising energy costs in recent years has led some seniors to wrestle with the tough decision of whether to "heat or eat." For over a decade, New Dawn has received multiple calls each month from seniors who are forced to make this trade-off. According to New Dawn, "They often have to make the choice between a meal-provision service (getting healthy, dietary appropriate meals delivered to their door) or to keep the heat going through the winter months."

In some cases, seniors have asked for temporary assistance to defer payments through the winter, so they can continue to pay for heating while securing enough food to eat. In other cases, participants have dropped out of the Meals on Wheels program altogether. With energy prices expected to rise in the future, more seniors on insufficient fixed incomes will be impacted.

While there are programs to help seniors upgrade older homes and complete energy efficiency assessments and retrofits, connecting to and navigating these programs can be difficult for many. Poverty, social isolation, literacy, financial literacy, and access to the internet all pose challenges that keep seniors (particularly low-income seniors) from accessing the programs intended to ease some of their energy costs. Because of this, many don't apply, and of those who do apply, many don't make their way through to the end of the process.

An equitable transition to a low-carbon future should include special consideration and efforts geared at elders living in our communities. One way to better reach low-income seniors is to partner with non-profit organizations and government agencies regularly serving this population. Just as important is ensuring that for house repair or energy retrofit offerings, anyone who struggles with literacy, internet access, and social isolation can be assigned a case worker to help them identify programs for which they are eligible, undertake necessary assessments, work with local contractors, and complete any post-renovation paperwork needed to secure funding and rebates. "We must be careful not to assume that all Nova Scotians are able to navigate each step in these processes with the same ease and success."

3. Energy Poverty in Nova Scotia

Section 3 – How many Nova Scotians experience energy poverty?

To estimate current energy poverty rates in Nova Scotia, EfficiencyOne developed an energy poverty dashboard. The dashboard combines a variety of data sets to calculate the rate of energy poverty at a community (postal code) level. At this level it is possible to review data such as median and average wages (before and after-tax), home counts, ownership percentage, age of households, electric and non-electric sources of heating, and other variables related to energy poverty.

With these insights it is possible to identify which geographic areas have the highest rates of energy poverty in the province. Figure 4 shows an image of the dashboard. Additional details about this energy poverty dashboard are provided in Appendix 1.



FIGURE 4. IMAGE OF ENERGY POVERTY DASHBOARD FOR NOVA SCOTIA

The dashboard was used to calculate energy poverty levels in Nova Scotia. This includes the fluctuating costs of energy and the impact this has had on energy poverty levels in recent years. Table 1 shows how energy poverty levels in Nova Scotia have changed over time.

Nova Scotia Households in	% of Nova Scotia Households in	Source
Energy Poverty	Energy Poverty	
147,085	37%	CUSP, 2019
134,245	33%	Gifford, 2022
151,495	35%	EfficiencyOne - based on energy prices as of January 2022
209,735	48%	EfficiencyOne - based on energy prices as of October 2022
173,560	40%	EfficiencyOne - based on energy prices as of June 2023
185,024	43%	EfficiencyOne - based on energy prices as of December 2023*

TABLE 1. ESTIMATES OF NOVA SCOTIA HOUSEHOLDS IN ENERGY POVERTY

*These energy prices (before-tax) are used for energy bill estimates throughout this report: Electricity: \$0.16354/kWh; Furnace oil: \$1.37/litre; Natural gas: \$23.47/GJ; Propane: \$1.04/litre; Wood: \$373/cord

The last four rows of Table 1 demonstrate how the rates of energy poverty are tied directly to energy prices. The only variable that changed in those rows was the price of energy, which has fluctuated significantly in recent years. The dashboard also allows for a comparison between the various communities across Nova Scotia. Table 2 lists the 10 communities most affected by energy poverty.

#	Postal Code	Community	Households in Energy Poverty (#)	Households in Energy Poverty (%)
1	B1W	Eskasoni	767	87%
2	B1G	Dominion	661	68%
3	B1H	New Waterford	2,983	67%
4	B1N	Sydney North	1,819	67%
5	B3R	Spryfield	2,560	65%
6	B1A	Glace Bay	4,627	63%
7	B1V	North Sydney North	1,772	62%
8	B1P	Sydney North Central	4,149	61%
9	B1E	Reserve Mines	476	59%
10	B1B	Port Morien	431	57%

TABLE 2. TOP 10 NOVA SCOTIA COMMUNITIES WITH THE HIGHEST RATES OF ENERGY POVERTY

In addition to the dashboard, other reports and research have provided insights into energy poverty in Nova Scotia:

- A 2022 energy poverty study in Bridgewater (Riva, M; Debanne, L; Bertheussen, M, 2022) found:
 - \circ 38% of households surveyed experienced energy poverty.
 - 32% reduced spending on groceries to pay for energy.
 - 23% had challenges with paying bills on time.
 - 21% were cold inside their household during the winter (28% of renters and 17% of homeowners)

- 72% of all tenants pay their own electricity; the other 28% have electricity included in their rent (Gifford, 2022).
- 17% of tenants pay their own non-electric heating bills, while the other 83% of tenants either have non-electric heat included in their rent or have electric heat. When considering the subset of tenants in energy poverty, 42% of these tenants pay directly for non-electric heating fuels (Gifford, 2022).
- 55% of tenants pay for their space heating costs (rather than having it embedded in the rent). However, this is more common for people renting a house rather than a unit in an apartment building (Nova Scotia Power, 2020).
- At a national level, the rural population has a greater prevalence of energy poverty than those living in urban areas (CUSP, 2019; Riva, Kingunza Makasi, Dufresne, O'Sullivan, & Toth, 2021).

Voices From the Community – The Lotus Centre and LEA Place Women's Resource Centre

There are nine independent women's resource centres in Nova Scotia, each of whom are members of Women's Centres Connect. This includes The Lotus Centre in Truro and LEA Place Women's Resource Centre in Sheet Harbour. These centres support women in a variety of ways including counselling and crisis intervention, advocacy, court-system navigation, and programming.

Many people in energy poverty are experiencing a variety of challenges, high energy bills being one of them. "Problems that compound can spiral out of control quickly. A lot of our clients have multiple issues related to poverty and are not able to meet their basic needs," say representatives of the two centres. This includes new problems that arose in part due to high energy costs. For example, the centres have noticed that heat is sometimes no longer included in monthly rent. In past years, heat was always included, so the overall costs were more affordable. Now, rental costs are higher, and in addition, the tenants sometimes need to cover heating costs. Like many other organizations across the province, the centres hear many stories of women who need to make the choice of whether to "heat or eat."

For example, one family has been in energy poverty for over five years. This family comprises two kids and two adults living in public housing. Their issues have compounded over time. Health issues lead to one of the adults being hospitalized due to stress. Not being able to afford food and pay the power bill intensified their issues. This family is in a perpetual cycle of stress due to not being able to clear their past due power bill and is at risk of having electricity disconnected.

Another story is of a low-income family behind on their power bill. There were drug addiction issues in the home. Then Hurricane Fiona tore the electricity power mast off the home. The family needed to fix the mast but had no money. Their bill went into collections and they needed a lot of financial help. They ended up with no electricity in the spring and summer; they couldn't keep food in the fridge, and they couldn't bathe. The authorities become involved as kids lived in the home.

"Things can very quickly get into a chaotic state," note representatives from both centres. In the examples above, the families were not just dealing with high energy bills, they faced difficult circumstances, and energy costs were simply too much for them to afford. Coupled with other issues, things fell apart quickly. In the more rural areas, the challenges are greater. There is sometimes no access to internet or cell phone service, the first means of access for many.

Telling these stories is an important step. "This information needs to get to those who are making decisions." There's a lot of work that needs to be done, and it can include making changes to electricity rates, getting the word out to those hardest to reach, and recognizing that high energy bills are often one of many problems faced by a family.

4. An Equitable Transition to a Net-Zero Future

Section 4 – What is an equitable transition to a net-zero future? How does it relate to energy poverty?

While EfficiencyOne has significant expertise in energy efficiency and while we have undertaken equityrelated initiatives, we are not experts in equity. We realize we need to continue to listen and learn from others, and further integrate equity into energy poverty programs. There are a variety of other organizations that have expertise in equity, some of which focus specifically on equity and energy, and this section reflects their expertise.

4.1 Equity

In this paper, equity in relation to energy use means providing assistance to individuals and families so that people can better manage their energy bills. This requires spending more time, effort, money, and staff resources on key groups of people and specific communities. An equitable transition to a net-zero future must incorporate equity considerations into a variety of programs and services including those that reduce energy poverty.

There is an important difference between equality and equity. Equality, in this context, means having equal access to energy efficiency programs (i.e., not restricting access to certain people). Equity, on the other hand, recognizes the ability of being able to participate in programs (i.e., doing more for some people so they can achieve energy bill reductions). As reported by Northeast Energy Efficiency Partnerships (NEEP), to truly consider equity means to recognize that there are inequalities and disparities that already exist in housing and among different segments of the population. "Equity ensures everyone is given an equal opportunity to thrive, which may mean that resources are divided and shared unequally." (NEEP, 2022).

Addressing equity requires consideration of the people and communities that face challenges or barriers and better understanding their situations and viewpoints. "Equitydeserving groups" is a term commonly used when referring to individuals, or a group of individuals, who face one or more barriers to equal access, resources, and opportunities because of discrimination and/or disadvantage. Marginalization of these communities and people can be due to historic, attitudinal, environmental, and social factors, (Canada Council for the Arts, 2022). Some classifications of equity-deserving groups relate to the 1995 Employment Equity Act, which sought to reduce barriers for four specific groups of people: Indigenous people, women, visible minorities, and people with disabilities. A more current view in a report published by the University of Ottawa suggests that equity-deserving groups relate to many more identities: "An individual's experience may

Equity vs. Equality

Equity is not the same as equality. In the context of energy efficiency programs, equality means everyone has equal access to participate (e.g., no eligibility restrictions in programs). Equity, on the other hand, means recognizing that many people have barriers to participating, and extra support is needed to overcome these barriers so everyone can benefit from energy efficiency upgrades. be shaped by multiple identities simultaneously. Identities may relate to religion, age, disability, gender, geography, culture, income, sexual orientation, education, sex, language, ethnicity or race." (Beck, Frank, & Tohme, 2022). The Urban Sustainability Directors Network (2018) also includes many of these identities and further notes that barriers are often rooted in structural and institutional racism.

The following statistics highlight examples of some equity-deserving groups in Nova Scotia.

- 5.5% of the population is Indigenous. This is roughly the same as the 5.7% documented in the 2016 census (Statistics Canada, 2022).
- 9.8% of the population identifies as a visible minority. This is up from 6.5% in the 2016 census (Statistics Canada, 2022).
- Immigrants represent 7.5% of the population. This is an increase from 6.1% in the 2016 census (Statistics Canada, 2022).
- 30% of Nova Scotians have a disability (age 15 years and older). Disabilities are more prevalent in seniors (41%). Examples of disabilities reported include pain (20%), flexibility (14%), mobility (13%), mental health (12%), hearing (7%), and visual impairment (7%) (Government of Nova Scotia, 2022).
- 22.2% of the population are seniors, age 65 years and older (Statistics Canada, 2022).
- 62,220 people's first language is neither English or French; 36,450 people speak languages at home other than English and French; and 3,245 people speak neither English nor French (Statistics Canada, 2022).

Not everyone in the groups above experience energy poverty. However, this list represents examples of different communities to consider when considering equity.

4.2 Considering Equity in Energy-Poverty Initiatives

Considering and addressing equity in energy efficiency programs has gained significant attention in recent years. Studies have drawn a direct connection between energy poverty and equity. For example, NEEP indicates that visible minority communities are more likely to spend above average amounts on energy, thus more likely to be in energy poverty. These communities were also found to have less-efficient housing and have a greater need for more energy efficient upgrades (NEEP, 2022). A similar report in British Columbia demonstrated that energy poverty disproportionately impacts households of equity-deserving groups (Ashcroft & Acacia, 2022). Furthermore, households with someone who has a long-term disability or illness, or at least one person who is senior (age 65 or older), or those with a lone-parent or single occupant have a significantly higher chance of being in energy poverty. It is also more common for energy poverty to affect women (Riva, Kingunza Makasi, Dufresne, O'Sullivan, & Toth, 2021).

There are many examples of how integrating equity into programs includes doing more for a particular segment of the population. This is because some individuals and communities face a variety of barriers not faced by others. This can include barriers that relate to historic discrimination, personal abilities, and location. For example:

• No proof of homeownership is an issue in some African Nova Scotian communities (CBC Nova Scotia, 2019).

- Lack of understanding of programs and social institutions (which can be tied to education).
- Access to information, such as no high-speed internet in rural areas.
- No time to participate in programs because household members work numerous part-time jobs.
- Distrust of some institutions, which can be tied to historical racism and discrimination.

Some individuals in equity-deserving groups may experience barriers to even learning about and registering for an energy efficiency program. Examples include:

- Access to information Seniors, for example, may be less likely to find information about a
 program if it is primarily available online. In fact, some Nova Scotia municipalities we spoke to
 indicated that there are still a large number of Nova Scotians without access to high-speed
 internet, a barrier for rural households. Providing numerous outreach methods is important to
 promote inclusion. One approach that has been used in Nova Scotia successfully is to work with
 and/or employ members of a specific community to help spread the word and educate other
 community members about a given program and the benefits of participating.
- Confusion Many of the municipalities engaged indicated there can be confusion in their community about different programs. This includes programs offered by various non-profit organizations, the municipality, the province, and the federal government. It was suggested that support to navigate the various programs would be beneficial.
- Language Not everyone understands English. NEEP (2022) and ACEEE (2023) noted language can be a barrier and suggest in some cases program materials be translated. One example is the Mi'kmaw Home Energy Efficiency Project, where program materials are available in the Mi'kmaw language.
- Distrust Some municipalities and community groups mentioned that there can be general skepticism by community members. Some offers sound too good to be true.
- Other There are, of course, other barriers to learning about and applying for energy poverty programs. These barriers can be best understood by engaging communities and then developing a plan to address barriers to participation.

Overcoming the deficiencies of a building is another important example of how equity should be considered in energy efficiency programs. This is an especially significant issue for those in energy poverty because they likely do not have the funds to pay to fix the problems. In British Columbia, one study found that between 7-15% of low-income households in energy poverty needed major repairs to their building (Ashcroft & Acacia, 2022). Examples of issues in buildings that should be fixed before installing energy efficiency upgrades include:

- Moisture or mold damage Not only can these lead to health concerns, but they can prevent basement or crawlspace insulation upgrades, for example.
- Roof leaks These prevent attic insulation upgrades and potentially solar photovoltaic system installation.
- Limited electrical panel service This can limit options to add heat pumps and other upgrades. This is especially relevant when considering oil-heated homes.
- Lack of proper ventilation This encompasses air exchangers and bathroom and kitchen exhaust fans. Ventilation issues can be largely influenced by the number of occupants. As indicated by the Assembly of Nova Scotia Mi'kmaw Chiefs (ANSMC) and Kwilmu'kw Maw-klusuaqn Negotiation Office (KMKNO)/Mi'kmaq Rights Initiative, overcrowding in Mi'kmaw homes can be an issue

(Prosper, Chief Paul, 2019). In these situations, appropriate ventilation should be installed and may otherwise limit upgrade options.

• Storage – This can be an issue when many existing items need to be moved to make space for new insulation. The HomeWarming program, for example, can include building raised storage platforms in attics that allow for insulation upgrades while maintaining storage space.

Performing other required retrofits before completing energy efficiency upgrades is important, but the reality is it costs money. Existing programs address this issue in a number of ways. For example, Mi'kmaw Home Energy Efficiency Project staff discuss situations with community housing managers to see if other home issues can be addressed first. Similarly, energy upgrades for HomeWarming participants may be put on hold until repairs can be completed with funding from Housing Nova Scotia, a government agency with a budget to fund upgrades. While there are options available, situations still exist where homes do not receive energy efficiency upgrades due to issues with the building. This can include houses with issues so significant that it is simply not possible to perform energy efficiency upgrades.

One potential solution is for energy-related programs to allocate additional funds for non-energy-related upgrades. Setting aside additional funds to reduce barriers was also mentioned by the American Council for an Energy Efficient Economy (ACEEE, 2023). Absent additional support to overcome some of these barriers, equity-deserving individuals, households, and communities may fall further behind as they are affected by higher energy costs in the future.

Aside from addressing outreach and building issues, other reports and training programs provide highlevel principles for how to consider equity in energy efficiency programs. For example, the Urban Sustainability Directors Network has developed 12 principles to consider when designing equitable cleanenergy programs (USDN, 2018). The Energy Equity Project from the University of Michigan provides a framework with four dimensions (recognition, procedural, distributive, restorative) and 12 different indexes with details on how to establish an energy equity plan (Energy Equity Project, 2022).

ACEEE works directly with community-based organizations to listen and learn how to address equity (ACEEE, 2023). Their *Leading with Equity* report identifies three dimensions of equity: procedural (e.g., appropriate engagement when developing programs); dimensional (fair distribution of programs and prioritization of those in greatest need); and structural (consideration of barriers rooted in past decisions that cumulatively lead to the current situation). Building these three dimensions of equity into program design and administration provides benefits (Drehobl, 2021). These dimensions build off former reports from the Urban Sustainability Directors Network, which has also identified a fourth dimension: transgenerational (ensuring current decisions do create unfair burdens for future generations). (USDN, 2018). Reports such as these provide guidance for those seeking to integrate equity into program design.

NEEP suggests that integrating equity into program design starts with recognizing the harms of the past and acknowledging there is an issue. This requires listening to those who are part of an equity-deserving group and experiencing energy poverty (NEEP, 2022). People with lived experience best understand the barriers and challenges they face and have insights into solutions. Engaging the community also helps build trust among potential participants, overcoming an initial barrier to participation (Kambo and REEP, 2022). The Urban Sustainability Directors Network (2018) suggests that in some cases community members should be compensated for their time. This helps further reduce the barriers to their participation and recognizes they have beneficial experience to share. Once a better understanding of an issue exists, the Urban Sustainability Directors Network recommends defining equity at an organizational level to achieve a common understating (USDN, 2018). Without a common understanding of what equity means, it may be difficult for an organization to effectively address equity issues. ACEEE (2023) also heard from community-based organizations that clearly defining equity is important (and critical for their state and utility scorecards), which includes identifying target populations. Finally, setting goals is essential. Goals related to equity could include an overarching goal, program participation levels, and community-engagement targets. For example, the Energy Trust of Oregon's *Diversity, Equity and Inclusion Plan* includes several goals including deepening engagement and increasing capacity, and investment in Indigenous and visible minority communities (Energy Trust of Oregon, 2022).

4.3 Support for Integrating Equity into Energy Poverty Initiatives

Organizations are calling for an equitable transition to a net-zero carbon future. Here are a few examples.

- United Nations
 - One of the 17 United Nations Sustainable Development Goals is to "ensure access to affordable, reliable, sustainable and modern energy for all." Targets include access to affordable energy and doubling the global rate of energy efficiency by 2030 (United Nations, 2022).
- Government of Canada
 - In an effort to be net-zero by 2050, the Government of Canada is seeking a "just transition" as energy systems and usage change across the country. One component of a just transition may include "addressing barriers and creating opportunities for groups including gender, persons with disabilities, Indigenous Peoples, Black and other racialized individuals, LGBTQ2S+ and other marginalized people" (Natural Resources Canada, 2021).
- Efficiency Canada
 - "Energy poverty needs to be prioritized if the transition to net-zero emissions is to be fair and just" (Kantamneni & Haley, 2022).
- David Suzuki Foundation
 - Successful and equitable energy transition occurs when "costs and benefits are distributed fairly and the needs of everyone are recognized and included." The Foundation also recommends that a national energy poverty strategy be developed that would include establishing an advisory group, setting targets, and encompassing continual improvement (Das & Martiskainen, 2022).
- United States
 - The US Administration has set a goal to have 40% of certain federal investments going specifically to marginalized and underserved communities. These investments include programs that fall into seven categories including energy efficiency, clean energy, clean transit, affordable housing, and workforce development. This goal recognizes a decadeslong trend of not investing enough in certain communities and requires meaningful engagement with affected communities (The White House, 2022).

• American Council for an Energy Efficient Economy (ACEEE)

In February 2021, ACEEE began a *Leading with Equity* initiative to identify metrics on prioritizing and including equity in energy programs and policies. ACEEE has since incorporated equity metrics into its scorecard for cities, states, and utilities (Drehobl, 2021). These metrics are developed by consulting with equity-deserving communities, and the 2022 state scorecard surpassed its goal of having more than 20% of the metrics related to equity (ACEEE, 2023).

• Northeast Energy Efficiency Partnership

 "Energy equity in energy efficiency programs means providing equal access to the benefits of energy efficiency programs and meeting customers where they are by designing programs that meet the needs of various communities" (NEEP, 2022).

• Energy Trust of Oregon

 Its Diversity, Equity and Inclusion Plan seeks to "engage and serve customers it has not been successful at reaching in the past – specifically people of color, people in rural parts of the state and people experiencing low or moderate incomes" (Energy Trust of Oregon, 2022).

• McConnell Foundation

 "An equitable transition to a net-zero carbon economy requires that those individuals, groups and populations that have been traditionally excluded, marginalized or underrepresented in climate solutions, and those who are most vulnerable to the impact of climate change, be resourced and empowered to participate in climate solutions that affect them" (McConnell Foundation, 2022).

Maw-lukutijik Saqmaq (Assembly of Nova Scotia Mi'kmaw Chiefs)

 "Higher electrical usage when coupled with other determinants such as the cost of electricity and other economic factors, is truly concerning. Mi'kmaw communities are the hardest hit by rising energy costs and least able to respond to new opportunities in energy efficiency and conservation. With the help of this continued demand-side management funding Mi'kmaq will be able to strengthen energy efficiency and conservation in hundreds of Mi'kmaw households throughout Nova Scotia, increase comfort and indoor air quality in homes, reduce greenhouse gas emissions, create local employment, and lower energy costs" (Maw-lukutijik Saqmaq, 2022).

• Membertou First Nation

"For a host of reasons, systemic or otherwise, our community, like many communities within Mi'kmaki, remains underserved and underrepresented in terms of energy program opportunities. Progress has been witnessed in recent years, particularly via the implementation of the successful Mi'kmaw Home Energy Efficiency Project in our communities under the current demand-side management plan. However, in terms of energy efficiency program options, further expansion and enhanced opportunities are needed" (Paul, 2022).

In addition to the last two examples above many others have a desire to do more in Nova Scotia. A variety of non-profit organizations, municipalities, and provincial government departments were engaged by EfficiencyOne to discuss energy poverty and an equitable transition. The purpose was to obtain additional insights on the significance of these issues and to hear examples of the challenges and barriers faced by

those in energy poverty. These engagements were in addition to previous and ongoing efforts with other groups such as Mi'kmaw communities. The following list gives a sample of the feedback received:

- "Energy poverty has significant human impacts. Many Nova Scotians are not able to keep their households comfortable in the winter. This includes not being able to sleep because the house is too cold."
- "Some residents go without heat for days because they cannot afford to heat their home."
- "People in energy poverty can experience negative health impacts due to the living conditions in their household."
- "Mental health is an issue, especially when there are ongoing concerns of not being able to pay bills, being disconnected from the utility, and not having a comfortable and safe living environment."
- "Town and city councils and the province can benefit from a more in-depth understanding of energy poverty rates in each community."
- "Meeting basic housing needs is a primary focus for some communities (the chronic shortage of housing), and energy poverty is secondary."
- "Energy poverty is not just about high energy bills; there are underlying economic and social issues that need to be addressed."
- "The worst-off people can sometimes be the hardest to provide support."
- "Some barriers to completing energy efficiency upgrades include upfront costs, deposits, credit checks, and durability issues with the homes (cracked foundations, wiring, electric panels, etc.)."
- "Some African Nova Scotians have challenges in obtaining land title, which has in the past lead to challenges of participating in programs." The Province has a Land Titles Initiative to help African Nova Scotians get title to their land (Province of Nova Scotia, 2022).
- "Defaults on financing programs can be an issue in low-income households, and they should not be expected to take on an extra financial burden."
- "Cash flow is key when considering energy upgrades (the difference between the cost for the loan to pay for the upgrades and the energy bill savings obtained by completing the upgrades)."
- "There are barriers for apartment owners and landlords to participate in energy upgrade programs due to the split-incentive issue. Landlords that do not pay energy costs are less likely to make efficiency improvements to buildings, and tenants are less likely to change their behaviour when energy costs are already included in their rent."
- "Even renters that do not pay energy bills can experience energy poverty if the portion of their rent tied to energy use is too high or increases with energy prices in the future."
- "Tenant rights are an issue that needs to be addressed."

This feedback demonstrates a need to increase support to reduce energy poverty in Nova Scotia and consider and integrate equity when doing so.

Voices From the Community - Society of Saint Vincent de Paul – Halifax Particular Council

The Halifax Particular Council of the Society of Saint Vincent de Paul is a charity that helps people in need. This includes providing food support, transportation, helping to pay for medication, and help paying arrears on heating and power bills. The Halifax Council is the umbrella organization for 17 Society of Saint Vincent to Paul groups located in Halifax and surrounding areas as well as in Amherst, Wolfville, Bridgewater, and Truro. There are over 350 volunteer members, primarily affiliated with the Catholic Church.

Last year the Society of Saint Vincent de Paul paid \$63,633 toward power bill arrears for over 200 households across Nova Scotia. They do this so people who cannot afford their bills still have electricity. While the utility does not generally disconnect electricity in the January-to-March period (the coldest months of the year), the Society of Saint Vincent de Paul tries to help prevent electricity disconnections all year round. It is between April and November, however, when utility and government-funded energy bill assistance programs have ended, that they receive a high volume of calls for help.

For example, a family of four, two adults and two teenagers, called because they needed help. They were \$2,000 overdue on their power bill and were soon to have their electricity disconnected. For many people, consistent access to electricity is taken for granted. A Program Coordinator with the Society said it best: "Electricity is invisible until it is no longer there." For this family, however, high energy costs were one of many issues they were facing. One of the parents had to go on sick leave to have cancer treatments, and the other had been working three part-time jobs for six months. Yet, they could not make their heat and electricity bill payments and were challenged to pay for glasses for one of their children. They were struggling to stay on their feet.

High energy costs also affect people trying to get back on their feet. This includes those with no housing. The Society helps those experiencing homelessness or fleeing domestic violence to get their electricity connected once they find an apartment or home. Securing an apartment, for example, requires having a damage deposit, first and last month's rent, clearing any energy bill arrears, and paying a deposit to the power company. These initial payments are significant barriers for some. In one case, when a woman who was homeless and living in a shelter finally found permanent housing, it took three organizations to come up with the funds to cover the necessary upfront costs.

While the Society recognizes there are a variety of programs to assist families and individuals, more help is needed. "Getting creative" is important when trying to solve a big problem like energy poverty. For example, it may be possible to use data to identify low-income areas and then ensure higher levels of program support are put into those communities that need it the most. In addition, it is important to explore what other jurisdictions are doing; there may be innovative options to help everyone maintain a basic, essential aspect of life – having an affordable, comfortable, and healthy place to live.

5. Energy Programs That Address Energy Poverty

Section 5 – What help exists to address high energy bills?

A variety of programs exist to help reduce energy poverty in Nova Scotia. Some of these programs also focus on equity. This section provides details on related programs administered by EfficiencyOne under the Efficiency Nova Scotia franchise. Other Efficiency Nova Scotia programs available to the general public may also provide additional support for households such as lighting and appliance upgrades. Those programs are not discussed in this report because they are not tailored specifically to energy poverty or equity. Examples of other energy poverty initiatives in Nova Scotia provided by other organizations are included here.

5.1 HomeWarming (est. 2006)

In their *Efficiency for All* report, Efficiency Canada praised Efficiency Nova Scotia's HomeWarming program. When considering programs that focus on reducing energy poverty, the report noted, this program provides the greatest level of energy savings per home in the country (Kantamneni & Haley, 2022).

HomeWarming, which has operated under different names in the past, began as a small pilot project in 2006 prior to the establishment of EfficiencyOne. This program covers the full cost of energy efficiency upgrades for low-income homeowners. Eligibility is based on homeownership (renters are not eligible) and income level. Current eligibility requirements are the LICO figure x 115%. Participants first receive a home energy assessment and then designated contractors perform upgrades such as insulation (attics, walls, and floors), draft-proofing, and heat pumps (a recent addition). A follow up energy assessment is then conducted to quantify the extent of energy savings. Depending on the size of the home, the percentage of the home's space heating energy use savings typically ranges from 25% (for larger homes) to 42% (for smaller homes), with an average of 31%. Based on the eligibility criteria, 55,600 homes are currently eligible for this program. As of September 30, 2023, over 24,250 homes have participated since 2006. Table 3 provides additional insight including energy bill savings.

TABLE 3. ENERGY SAVINGS AND	ENERGY BILL REDUCTIONS IN	THE HOMEWARMING PROGRAM

Primary Heating Type	Annual Energy Savings	Annual Energy Bill Reductions	Lifetime Energy Bill Reductions*
Non-electric fuels	40 GJ	\$1,700	\$38,970
Electricity**	5,240 kWh	\$860	\$19,710

* Based on the anticipated length of time the energy efficiency upgrade will continue to provide savings **Funding for electrically heated homes began in 2023 for EfficiencyOne; these are modeled projections.

5.2 Affordable Multifamily Housing (est. 2018)

Efficiency Nova Scotia's Affordable Multifamily Housing program is intended to assist owners of multi-unit buildings that offer affordable rental housing to low-income Nova Scotians. The program focuses on larger buildings but also provides heat pump rebates to buildings with between one and three rental units. Up to 80% of the energy efficiency upgrade costs are covered for cooperatives and property owners of rental units along with other non-profit organizations that provide support services for the community. Shelters and transition houses that provide rent-free housing can have up to 100% of their costs covered.

The program begins with an energy assessment of the building. Based on the recommendations, the building owner then obtains quotes for the desired work to be completed. These are then used to update the energy model and provide updated payback estimates (when the investment will have a netpositive benefit from lower energy bills). After upgrades are completed, a final energy assessment is performed to confirm energy savings, and the participant is reimbursed for the applicable portion of the costs. Eligible upgrades typically focus on the building envelope, common area lighting, space heating, and water heating systems. As of September 30, 2023, over 380 buildings have participated in this program. The average annual energy savings and lifetime savings are presented in Table 4.

Primary Heating Type	Annual Energy Savings	Annual Energy Bill Reductions	Lifetime Energy Bill Reductions*
Non-electric fuels	164 GJ	\$2,950	\$59,590
Electricity	22,538 kWh	\$3,320	\$58,764

TABLE 4. ENERGY SAVINGS AND ENERGY BILL REDUCTIONS (PER BUILDING) IN THE AFFORDABLE MULTIFAMILY HOUSING PROGRAM

* Based on the anticipated length of time the energy efficiency upgrade will continue to provide energy savings

5.3 Mi'kmaw Home Energy Efficiency Project (est. 2018)

All 13 Mi'kmaw communities in Nova Scotia are completing significant energy efficiency upgrades to band-owned homes. Housing managers in each community select the homes to participate. Participants first receive a home energy assessment, and then the list of preferred contractors provided by the housing managers is used to, whenever possible, select contractors to complete the upgrades. In most cases, the contractors have already worked within or are from the Mi'kmaw communities. Eligible upgrades focus on draft-proofing, insulation, and ductless mini-split heat pumps. On average, participants save 23% of the energy used in their homes. As of September 30, 2023, 972 homes have received upgrades and completed participation in the program. Combined energy savings results in annual energy bill savings of \$1.2 million for these communities. Over the life of the energy efficient upgrades completed, these communities will save \$22.9 million in energy costs. Table 5 provides the energy savings and energy bill reductions at a household level.

Primary Heating Type	Annual Energy Savings	Annual Energy Bill Reductions	Lifetime Energy Bill Reductions*
Non-electric fuels	30 GJ	\$1,310	\$30,020
Electricity	4,430 kWh	\$750	\$14,500

TABLE 5. ENERGY SAVINGS AND ENERGY BILL REDUCTIONS IN THE MI'KMAW HOME ENERGY EFFICIENCY PROJECT

* Based on the anticipated length of time the energy efficiency upgrade will continue to provide energy savings

5.4 Moderate-Income Rebates (est. 2023)

Funding from the Province of Nova Scotia and Government of Canada have enabled Efficiency Nova Scotia's Home Energy Assessment program to begin offering additional incentives for moderate-income Nova Scotians (for non-electrically heated homes). This includes, where eligible, top-up rebates over and above existing incentives, free energy efficiency assessments, and additional support to transition homes from oil to electric heat. To be eligible for rebates, among additional criteria, have a household income at or below the median Nova Scotia income level.

5.5 African Nova Scotian Community Retrofits Pilot Project (in development)

EfficiencyOne is developing a new project that supports African Nova Scotian communities with energy efficiency upgrades. This includes engaging African Nova Scotian communities to build the program roadmap. This is currently under development.

5.6 Summary of Efficiency Nova Scotia Programs

These Efficiency Nova Scotia programs are designed to help reduce energy poverty and/or consider equity in a transition to a net-zero carbon future. Efficiency Canada notes that Nova Scotia, along with Prince Edward Island, leads the way in low-income program investments (Kantamneni & Haley, 2022). Table 6 provides a summary of spending and results for these programs.

Brogram	Average Incentive Spend Per Building		Average Annual Energy Bill Savings Per Building	
Fiografii	Electrically Heated	Non-Electrically Heated	Electrically Heated	Non-Electrically Heated
HomeWarming	\$9,005	\$9,715	\$860	\$1,700
Affordable Multifamily Housing	\$18,240	\$29,910	\$3,320	\$2 <i>,</i> 950
Mi'kmaw Home Energy Efficiency Project	\$7,510	\$12,860	\$750	\$1,310
Moderate-Income Rebates	Program only recently launched			
African Nova Scotia Project	Project in development			

TABLE 6. SUMMARY OF EFFICIENCY NOVA SCOTIA PROGRAMS RELATED TO ENERGY POVERTY AND EQUITY

5.7 Halifax Climate Investment, Innovation and Impact (HCi3) Fund

HCi3 is a subsidiary of EfficiencyOne. One of HCi3's efforts include an annual grant program that offers funding to innovative projects that help Halifax/Kjipuktuk reach its goals of becoming net zero by 2050 through a just and equitable low-carbon transition. The 2023 projects either directly reduce greenhouse gas emissions and/or enable the conditions for equitable and meaningful climate solutions to support the region's journey to net zero. Two of the four objectives are equity and reconciliation:

"Equity: Groups and populations that have been traditionally excluded and systematically disadvantaged in climate solutions are empowered to participate in solutions that affect them."

"Reconciliation: Projects contribute to a reconciliation economy where wealth and resources are equitably shared and sustainably stewarded for this generation and those yet to come, in relationship with both Indigenous and non-Indigenous peoples."

5.8 Other Programs

A variety of other programs are available for Nova Scotians that need support with high energy bills. This includes, but may not be limited to:

- Heating Assistance Rebate Program (HARP) This program provides cheques to low- and moderate-income Nova Scotians to help offset the high costs of energy. In the most recent offering, the Province offers a one-time \$600 cheque per household based on income level (Province of Nova Scotia, 2023).
- Seniors Care Grant A support program for low-income seniors, \$750 is available to help cover the cost of home energy and other eligible household costs and healthcare services (Province of Nova Scotia, 2023).
- Your Energy Rebate Program This initiative removes the provincial portion of the harmonized sales tax (HST) on residential energy bills. In some cases, the HST is removed automatically from

energy bills (depending on the energy provider), and in other cases, one must apply to be reimbursed for the provincial portion of the HST that was paid. This tax rebate is not tied to income level (Province of Nova Scotia, 2022).

- Home Energy Assistance Top-up Fund Administered by the Salvation Army, this program has existed for more than 20 years. It provides income-eligible Nova Scotia households up to \$400 for emergency home-heating situations (Salvation Army, 2022).
- **Property Assessed Clean Energy** (PACE) and other clean-energy financing programs exist across Nova Scotia. These programs provide financing to households to install energy-efficiency or renewable energy upgrades with the goal of reducing energy bills. Some examples include:
 - HRM Solar City (administered by Halifax Regional Municipality)
 - Switch Wolfville (administered by PACE Atlantic)
 - Town of Bridgewater, Town of New Glasgow, Town of Amherst, and others (administered by Clean Foundation)
 - Canada Greener Homes loan, an interest-free loan up to \$40,000 per household

These financing programs are not specific to those in energy poverty. In some cases, homeowners that are behind on municipal bill payments (for example) may not be eligible.

• Efficiency Nova Scotia has other programs for residents, businesses, non-profits, and institutions that are not related specifically to those in energy poverty.

In addition to the programs discussed here, there are also other programs that help households with housing repairs and renovations. In some cases, these upgrades may be required as a precursor to energy upgrades. For example, Housing Nova Scotia's Homeowner Residential Rehabilitation Assistance Program provides funding of up to \$18,000 to low-income homeowners for structural (including leaks), electrical, plumbing, heating or fire safety repairs (Housing Nova Scotia, 2022).

5.9 Electricity Rates

Another option to help reduce energy poverty in Nova Scotia is to change how much people in energy poverty pay for electricity or fuel. The Affordable Energy Coalition (AEC), a non-profit organization based in Halifax, has been advocating for a program that would provide universal access to electricity for all Nova Scotians. Such a program has operated in various American-regulated electricity systems. As part of the 2014 Electricity System Review, the AEC suggested that regulations include a way for all Nova Scotians to have equitable access to electricity. Equity in this context means that electricity is accessible to everyone; costs should not limit access to electricity and should not be high enough to prevent anyone from also accessing adequate food, healthcare, and housing. The AEC proposed a universal service program that retains current rate structures but adds electricity bill credits for low-income customers (Affordable Energy Coalition, 2014).

The universal service program, as proposed by AEC in 2014, would include:

- 1. Aligning low-income households' electricity costs with their level of income;
- 2. Solving debts in arrears sustainably;
- 3. Offering emergency financial relief in certain circumstances (e.g., job loss, sudden illness); and

4. Providing energy efficiency upgrades to buildings.

AEC recommends electricity costs in low-income households remain below 6% of income for electrically heated homes and 3% of income for baseload electricity (Affordable Energy Coalition, 2022).

In 2022, the AEC commented on a proposed change to Nova Scotia's Bill 147, amending the *Public Utilities Act*, to ensure power rates can be changed to consider equity. AEC noted that "inequitable access to electricity has human rights implications" (Affordable Energy Coalition, 2022). As passed on April 22, 2022, Bill 147 amended the *Public Utilities Act* and now allows for the government to develop regulations and for the Utility and Review Board to establish "performance standards, requirements and minimums for Nova Scotia Power," including consideration of "equity, low-income service and energy poverty." The intent is to establish a Performance Partnership Advisory Table that would provide recommendations to the Utility and Review Board (Nova Scotia Legislature, 2022). The AEC indicated additional *Public Utilities Act* amendments were needed to remove a requirement that calls for charging rates equally to all people. AEC has also recently advocated that a universal service program could be tax funded instead of funded through electricity rates as is done in Ontario (Affordable Energy Coalition, 2022).

There are a number of examples of related universal service program efforts in other jurisdictions. These are listed in Table 7.

Jurisdiction	Overview	Source
Ontario Energy Board (Ontario, Canada)	 Ontario Electricity Support Program provides low-income electricity customers with an on-bill monthly credit. The credit ranges between \$35 and \$75 each month credit per household. The credit can be higher for electrically heated homes, those with certain medical devices, and for low-income Indigenous individuals. 	(OEB, 2023)
Alameda Municipal Power (California)	 Low-income customers can receive a 25% discount on their monthly electricity bill. 	(AMP, 2023)
Anaheim Public Utilities (California)	• There is a 10% credit on electric and water bills for low- income customers who are also military veterans, 62 years of age or older, or have a long-term disability.	(City of Anaheim, 2023)
California Alternate Rates for Energy (applicable to some electric and gas utilities in California)	 Enrolled low-income customers receive either a 30-35 % discount on their electric bill (for electrical utilities with more than 100,000 customers in California) or a 20% discount (utilities with less than 100,000 customers). This is funded by a rate surcharge paid by all other utility customers. 	(CPUC, 2023)

TABLE 7. EXAMPLES OF JURISDICTIONS WITH DIFFERENT RATE STRUCTURES BASED ON INCOME

Jurisdiction	Overview	Source
Green Mountain Power (Vermont)	 A special electricity rate (25% discount) is provided for low-income customers. This includes a discount on both the monthly energy charge and customer charge. There is also a one-time forgiveness on arrears for certain customers. 	(GMP, 2023)
National Grid (Massachusetts)	 The Residential Low-Income Rate R-2 provides a special electricity tariff for low-income customers. A credit of 32% is provided on the electricity bill for eligible low-income customers. 	(National Grid, 2023)
New Hampshire (applicable to regulated electrical utilities in the state)	 New Hampshire's Electric Assistance Program is funded by utilities that apply a systems benefit charge on electric bills. A discount between 8% to 76% (based on income) is applied to the first 750 kWh on monthly electric bills. 	(NHPUC, 2023)
New Jersey (various gas and electric utilities)	 Created by the state, this applies to electric and natural gas low-income customers. Eligibility also considers the percentage of annual income that is spent on electricity and/or gas. The goal is to limit the amount paid to less than 6% of annual income. The utility bill credit varies by household because it is based on energy expenditures and income level. 	(SNJBPU, 2023)
PECO gas and electric utility (Pennsylvania)	 The monthly utility bill is based on a percentage of household income. If the actual energy bill is less than what was paid (based on income), the customer pays the lesser amount. Arrears may be forgiven in some circumstances (for first-time low-income program customers). High energy users need to participate in an energy reduction program. 	(PECO, 2023)

Voices From the Community - South Shore Open Doors Association

The South Shore Open Doors Association (SSODA) is a non-profit organization formed in May 2022 following several years of community consultation. The organization works in Lunenburg and Queens Counties and is focused on ending homelessness.

Having a place to live is a key priority and renters are especially impacted by increasing costs. "People decide to pay their rent and hope to figure out the rest later," says SSODA. Even then, some renters are living in substandard conditions including buildings that are older, inefficient, and in need of renovations. Some renters are even living without heat, water, or electricity because they cannot afford to pay these bills. As of June 2023, there were 148 households/individuals working with SSODA who are experiencing homelessness or housing insecurity (60 of whom were experiencing chronic homelessness).

Things are changing in the rental market. While it was once commonplace to have utilities included in the monthly rent, in many cases, renters are now responsible for both the rent and utility costs. Furthermore, with extremely low vacancy rates, there is less of an incentive for landlords to upgrade their buildings. "Since the pandemic things have been getting worse. There is no vacancy, we have old housing stock, and many of the support programs focus on homeowners, not renters. Programs for renters are a Band-Aid solution; they are not fixing the problem."

Arrears on electricity bills is a significant problem. SSODA is aware of 102 households in energy poverty with electricity arrears totaling over \$93,450. In one example a household owed more than \$7,000. "This is an amount they will never be able to pay off based on their income." Another example is a rental unit that costs over \$1,000/month for electricity in the winter. "Energy bills like that are simply not sustainable especially for renters. If they are living in a very inefficient space that costs a lot to heat, it's the landlord who needs to make the decision to upgrade the building."

This is the common split-incentive experienced by many renters. For renters who cannot afford their utility bills, disconnections are not just about living without electricity for a while. Landlords then become concerned for the upkeep of their building and appliances, and evictions may occur if the renter is not able to keep their utilities paid. All of the stories from SSODA were tied to the housing crisis; in some cases, their clients were living in their cars or tents.

The high cost of energy is not the only factor. Numerous variables have led to a situation where some people are not able to afford housing, energy, and other daily necessities. One issue SSODA has seen is discrimination related to race, gender, and family size. On a much broader scale, an equitable transition must consider not only the impact of energy costs but also the availability of accessing suitable housing.

"Focusing on the solving the problem, rather than applying Band-Aids, is important." For example, sustainable energy costs are especially critical for those with a lower income. "Perhaps policies or regulations for minimum-efficiency standards or provision of utilities in the rental market can be considered." This could be coupled with support programs to help landlords get buildings upgraded to where they need to be. While the situation for renters is inherently more complex, it is important to provide support to both landlords and renters as energy prices continue to rise.

6. The Depth of Energy Savings

Section 6 – Are there other upgrades programs can include to further increase energy bill savings?

There are calls for the level, or depth, of energy savings in energy efficiency and renewable energy programs to increase. Efficiency Canada suggests obtaining savings greater than 50% of the household's current energy use (Kantamneni & Haley, 2022). In some programs, the focus is on insulating and draft proofing to make a building more efficient by reducing heat loss and increasing comfort. A variety of other upgrade options exist to increase the level of energy savings in a building, but they come at an incremental cost. It is important to recognize that program funders and administrators must consider the balance of completing significant energy savings while also helping a large number of participants. If increased energy savings per household increase, this inherently means that fewer households receive upgrades (absent additional funds). Two examples that could add to the energy savings achieved are highlighted in this section.

6.1 Heat Pumps

Up until recently, heat pumps were an upgrade in some low-income programs, but not others. A recent increase to budgets now allows for heat pump installations in other energy poverty programs. Based on the energy poverty dashboard for Nova Scotia, oil-heated households experience greater levels of energy poverty, and installing heat pumps (at the very least, mini-split heat pumps) could provide further energy bill reductions. Mini-split heat pumps are the most common heat pump installed in Nova Scotia and provide significant gains in the efficiency of the home's heating system(s). The average cost (including tax) to install mini-split heat pumps in households that are already suitable (floor layout, proper electrical panel, etc.) varies by size of the system. For a single zone 12,000 BTU/hour system the average cost is \$7,200. Multiple zones would be needed to provide heating to either the whole home or the majority of the home, and additional costs for electrical panel upgrades are sometimes necessary.

Not all buildings, however, are well-suited for this type of heating system. For example, floor layout may prevent proper heat distribution and can limit the desired energy savings. Other homes may also require electrical panel upgrades, thus increasing the cost. Also, households with access to a free or low-cost supply of wood (to burn in wood stoves, fireplaces, or a central wood furnace or boiler) may see energy bills increasing if they use and install heat pumps. Considering the specific situation of the household, along with education on energy costs, is important to ensure that there is a focus on energy bill reductions.

6.2 Solar Photovoltaic Systems

Solar photovoltaic panels produce electricity and are another upgrade option. Systems installed on Nova Scotia homes range from 6 to 12 kW with an average 10.5 kW in size (roughly 26 panels) and cost on average \$25,700 to install before tax. On average, these systems produce 11,360 kWh/year of electricity,

translating into annual energy bill savings of \$1,850. Based on the current greenhouse gas intensity of the electricity grid in Nova Scotia, these systems can lead to significant greenhouse gas reductions as well as bill savings to participants.

In some households, this upgrade may be one of the only remaining options to achieve energy use reductions of 50% or more. However, low- to modest-income households are not likely able to afford this upgrade. Similarly, program spending to this degree (in addition to current energy improvements) would mean a significant increase to budgets. Even if funds were to become available, it is important to recognize that not all households will be suitable for this upgrade. For example, homes that need to replace roof shingles in a few years should not have solar photovoltaic systems installed beforehand as it will lead to an additional cost to remove the solar panels while new shingles are being installed later temporarily.

6.3 Other Examples and Electrification

There are, of course, other options such as replacing large appliances (included in some programs), electric water heating systems with heat pump water heaters, oil-fired domestic hot water heaters with standard or three-stage electric hot water tanks, and increased levels of insulation in walls. The purpose of this section is simply to note that there are a variety of other opportunities to further energy reductions in homes via energy efficiency upgrades.

A net-zero carbon Nova Scotia is contingent on a significant number of households transitioning from their fossil fuel heating systems to electricity. Efficiency Canada suggests that it is also important to help low-income households access cleaner fuels (the future electricity grid in Nova Scotia). This is because the cost of furnace oil is likely to increase when demand goes down over time as homes and businesses make the switch to electric heating. When this occurs, oil-delivery companies lose their economies of scale and prices increase. In turn, this pushes households into greater energy poverty ((Kantamneni & Haley, 2022). As with the previous upgrade options, programs can also consider fuel-switching.

6.4 Deeper Savings Considerations

Efficiency Canada calls for energy savings of at least 50% in households experiencing energy poverty (Kantamneni & Haley, 2022). Achieving these levels would require higher investments either from program funders or partially from the homeowners and landlords.

There are some examples of higher levels of spending in the United States where the Build Back Better initiative has an upper limit spend of \$15,000 USD. This rises to more than \$25,000 USD when federal and state incentives are combined. However, even these levels pale in comparison to projected costs to achieve 60% energy savings: \$56,000 to \$96,000 in single-family dwellings, or \$46,000 to \$66,000 in single-family units in a multi-family unit building (Kantamneni & Haley, 2022). In EfficiencyOne's deep energy retrofits analysis, costs to achieve roughly 50% of energy savings ranged from around \$25,000 to \$52,000 (these figures do not include solar photovoltaics as options). Overall, spending can vary greatly depending on the building type, upgrades already performed, and upgrades selected.

In some circumstances, it could make sense for a cost-sharing agreement between the funder and participant given the significance of the potential energy bill savings. In such a situation, the program would pay for certain upgrade costs and the homeowner or landlord could finance the rest (ideally via low-interest financing). Having the household finance part of the cost requires first considering whether household debt is increased. A report on equity and financing programs recommended that financing should not be provided to some low- to modest-income households where it increases their household debt (Kambo and REEP, 2022). One municipality in Nova Scotia stated that accumulating debt is a tool that should only be used in emergencies. Increasing debt may prevent the household from borrowing additional funds for other necessary purchases. As such, being net cash-flow positive is very important.

Another report sets out four considerations for an equitable financing program: protect the consumer; establish late and non-payment processes; reduce financial risk; and create equity-based key performance indicators (Kambo and REEP, 2022). In theory, financing for some modest-income participants that will remain cash-flow positive (monthly energy-bill savings exceed monthly financing costs) could be an option. Setting aside funds to cover potential loan defaults was also mentioned during engagements.

Voices From the Community - Eskasoni Mi'kmaw Nation

Eskasoni is located in Cape Breton and is the largest Indigenous community in Atlantic Canada. With more than 5,000 Band members, over 4,800 of whom are living on the reserve, they are the largest Mi'kmaw-speaking community in the world.

Mi'kmaw communities have experienced discrimination for centuries including having been placed on a reservation. Ongoing discrimination has led to a variety of issues that continue to persist. For example, houses in the community are often overcrowded with intergenerational families due to the shortage of housing. This has led to houses and appliances deteriorating more quickly. For example, hot water tanks, plumbing, and floors deteriorate at a higher rate because of overcrowding. Due to the significant increase in population, there are often many people living under one roof, which can lead to challenges related to indoor air quality. For example, preparing meals large enough to feed a family of 14 means a lot of soups and stews, and this can lead to excess moisture in the air. Mold and other indoor air-quality issues can then arise. This is especially a concern for homes built prior to 1985 that do not have proper ventilation.

Homes built before 1985 were not required to be built to national building code standards as community members were building their own homes in an effort to meet the demands for more housing. Many of these buildings now need upgrades to address structural and mold issues. Of the approximately 1,200 homes on reserve, roughly 700 were built before 1985. Climate change is exacerbating the problem. For example, flooding and high humidity has led to mold in homes that previously did not experience such issues. This has led to an increase in respiratory conditions among community members, including children.

Housing problems are also made worse by not having electrical service. For example, one family needed to put their money into buying a vehicle and food, so they cancelled their electricity for four months. While an extension cord from a neighbour's house was used to keep the fridge running and food cold, cancelling the electricity led to serious mold problems in the basement. Depending on the time of year, there can be other negative impacts to a building from not having electricity to provide heat.

The community members most affected by energy poverty are the working poor. These are people who have a job but struggle to make ends meet and "the already high, and increasing, cost of electricity or oil can make or break them," says a representative of the Eskasoni Housing Department, which works on renovations and new housing projects.

Another story is of a single mom making less than \$40,000 a year, who is facing a challenging situation in the face of ever-increasing price hikes. Making ends meet is not always possible. This mother is not alone. There are several stories every year about the working poor who have had to cancel their electricity for a period of time. They are inherently at a disadvantage. "When appliances break, they buy older secondhand appliances that are less efficient. It's all they can afford, but that leads to higher energy bills because these appliances consume more energy," says the Housing Department.

Voices From the Community - Eskasoni Mi'kmaw Nation, continued

The Mi'kmaw Home Energy Efficiency Project provides funding for energy efficiency upgrades that may not happen otherwise as allocated funding often focuses on emergencies. Higher energy efficiency in homes "raises the standard, decreases mold, increases the longevity of the home, and improves the health and quality of life for the people living there."

Ongoing education for community members is also very important. For instance, heat recovery ventilators (HRVs) are designed to provide fresh air for a home while removing stale air. This helps reduce moisture levels in the home and allows fresh incoming air to be pre-heated by outgoing air. However, some community members have removed their HRV because they didn't like the look of it or because they thought it would significantly increase their electricity bill. Education about a home's mechanical systems such as HRVs, kitchen exhaust fans, and bathroom fans needs to increase.

In Eskasoni, developing an understanding of modern appliances is further complicated by language barriers. Mi'kmaw is the first language, but it can be difficult to translate concepts where the technical term in English does not have a complementary word in Mi'kmaw. "People may nod their heads but not really understand. For that reason, continuing education is important so people can live in healthy, energy-efficient, homes."

7. Recommendations

Section 7 – What are the primary ways enhanced energy efficiency can further support those in energy poverty?

Nova Scotia is already a leader in addressing energy poverty. The recommendations below are based on two themes: continuing existing efforts and expanding into new areas to further reduce energy bills for households experiencing energy poverty.

7.1 Continue Existing Energy Efficiency Programs

This paper clearly demonstrates there is a need to maintain existing programs that provide Nova Scotians with significant energy bill reductions.

Recommendation #1: Commit long-term funding to energy efficiency programs for those in energy poverty until at least 2030

• Electricity energy efficiency and conservation funding, regulated by the Nova Scotia Utility and Review Board, exists until December 31, 2025. The next funding agreement is expected to run from January 1, 2026, to December 31, 2030. In addition, government funding is committed to a variety of energy poverty programs over the next several years with varying end dates. Aligning government funding with the newly anticipated electricity energy efficiency and conservation funding will allow for a well-coordinated effort to reduce energy bills for those in energy poverty for the foreseeable future. Long-term funding security also provides the energy efficiency industry with confidence to invest in resources, helps reduce overall costs, should consider inflation costs, and demonstrates a commitment to address energy poverty.

Recommendation #2: Monitor and evolve new program offerings

• There are three relatively new program offerings for those in energy poverty. First, there is funding for heat pumps in HomeWarming (a new addition for non-electrically heated homes). Second, top-up incentives are available for moderate-income homeowners in the Home Energy Assessment program (for non-electrically heated homes). Third, an African Nova Scotian Community Retrofits Pilot Project is in the works. Each of these should be monitored over time to ensure they are effectively addressing energy poverty. This should include a review of the level of energy savings in participating households and a review of options to evolve the new program offerings over time. Future funding for moderate-income homeowners in the Home Energy Assessment program (for electrically heated homes) could also be provided to allow for all moderate-income homeowners to be eligible.

7.2 Develop New Initiatives

In addition to maintaining existing programs, more funding should be provided over time to better assist renters, enhance the depth of energy savings, and improve equity.

Recommendation #3: Establish a program for moderate-income renters

• The Affordable Multifamily Housing program is currently available for buildings that provide affordable rentals, with the intention of serving low-income tenants. However, moderate-income Nova Scotians also experience energy poverty, and there is a notable gap in support for these renters. Energy efficiency funding should also be provided to landlords and building owners who have rental rates geared towards moderate-income Nova Scotians.

Recommendation #4: Achieve deeper energy savings

• Efforts are already under way to achieve deeper energy savings (e.g., via heat pumps in HomeWarming). However, there are other upgrade options, and over time programs should consider including additional energy efficiency measures to further reduce energy bills in participating households. This will require more funding, and new upgrades can be integrated over time based on available funds and contractor capacity.

Recommendation #5: Further efforts to address equity by focusing on barriers to initial participation and issues with a building

 There is a need to dedicate more money and resources to address two primary equity barriers. First, build on existing efforts to further address the initial-participation barrier. This can include increased resources for hard-to-reach program participants. Second, increase funding to allow for more building upgrades that are a prerequisite to energy retrofits. This can include fixing minor structural issues, addressing moisture concerns in the home, and more. In the future, it could even evolve into other upgrades to improve resiliency related to climate change (e.g., improvements related to flood and fire risks).

7.3 Conclusion

These recommendations are meant to help people, and they can be considered by any organization working to address energy poverty. This includes those funding and/or administering specific programs (including EfficiencyOne) as those making decisions can have a direct and significant influence on the lives of Nova Scotians. The recommendations can also be considered by other groups such as related support groups or advocacy groups.

These recommendations are meant to be one step further in the evolution of programs for those in energy poverty. This is an ongoing process and budgets, programs, eligibility, and other details will continue to evolve over many years. Energy poverty and equity are significant and complex issues with many variables and considerations that go well beyond energy costs. Ongoing efforts are also needed to increase income levels; reduce other household costs; increase skills, capacity, and education; and address the wrongs of the past that stem from racism and discrimination. While reducing energy bills is only one piece of the puzzle, benefits of energy savings can be significant for individuals and households. It can mean they no longer need to decide between heating or eating, it can result in significant comfort improvements in the household, improve health, and reduce the ongoing stress of financial worries related to energy bills.

Voices From the Community - Nova Scotia League for Equal Opportunities, Pictou County Resource and Sexual Assault Centre, and Chebucto Connections

EfficiencyOne spoke with three organizations with clients from a variety of backgrounds who experience energy poverty. The Nova Scotia League for Equal Opportunities is a provincial organization that works across sectors and advocates for full inclusion and accessibility for persons with a disability. They challenge discriminatory policies using a rights-based approach. The Pictou County Resource and Sexual Assault Centre (PCRSAC) works on gender-based issues and violence by providing direct services and advocating for social change. Chebucto Connections works with the community to identify and attract resources to improve the overall health and well-being of residents that include at risk youth programming and food insecurity. Despite the diverse nature of these organizations, they all have people from the community seeking help related to energy poverty.

"Energy poverty doesn't get the attention it deserves. However, it always comes up in discussions for those unable to afford everyday essentials like medications, diapers, and paying rent." Systemic equity issues are tied directly to poverty, including energy poverty. For example, "people born with a disability have a greater chance of being in poverty because of their higher cost of living. Others that age into a disability can have a hard time making ends meet because they are on a fixed income." Many barriers intersect and can impact one's education, social interactions, employment opportunities, and housing, leading to a greater chance of being in poverty. Another example is women. 24% of the women that access the PCRSAC come through the door because of financial insecurity or poverty.

One story comes from a family with a member who had a permanent disability. Coming up to the winter they accepted they would not be able to afford power. They did all they could to use food banks and other services, however, they had no heat. Extension cords from a neighbouring home were used to run small appliances. All of this was done under the radar because the family was worried about the kids being taken away due not having a suitable living environment. "In Pictou county just under 25% of the kids live in poverty, some are living in extreme poverty".

There are even stories of people contemplating ending their life due to fear of living on the street. For example, some people with disabilities living in dire financial situations have asked about medically assisted dying. They were struggling to pay their bills and for their medication. While energy prices are only one of the many expenses, the effect of poverty on people is significant. For those on income assistance or a fixed income, higher costs for any of life's necessities is a huge challenge.

All three organizations recognize that while financial assistance programs have increased in recent years, others are still too low, and some are restricted to one-time support. One of the challenges is trying to get ahead by reducing energy use. However, even when there are rebate programs, paying the contractor up front is simply not an option for people with lower incomes. What's needed are innovative solutions that consider all areas of support and seek to further reduce barriers. This could mean changes to funding in some programs, to eligibility to make programs more uniform, or to remove restrictions to make programs more accessible. "People should not have to be in a situation where the lose power...it only makes things worse – kids doing homework by candles, and not having power for internet means they fall behind in school."

Section 8 – "Efficiency First" in an equitable net-zero future

"Energy efficiency is the first fuel – the fuel you do not have to use" (International Energy Agency, 2019)

"Energy efficiency is the first fuel – the fuel you do not have to use" (International Energy Agency, 2019). This is especially important for those experiencing energy poverty. As stated in EfficiencyOne's 2021 White Paper, "Efficiency always tops the priority list for any effective decarbonization strategy, not only for its direct cost-savings and emission-reduction benefits but for the role it plays in facilitating electrification and in optimizing the amount of additional infrastructure required to achieve and maintain a carbon-free supply of electricity" (EfficiencyOne, 2021). In practice, this means making households more efficient first (e.g., improvements to the insulation and draft proofing), then focusing on heating systems, appliances, lighting, and then renewables. The recommendations in this report continue to promote the "efficiency first" principle, and continuing and growing existing efforts will provide significant help to those who need it the most. There are, however, other future considerations beyond household energy efficiency upgrades.

For example, a net-zero future requires greenhouse gas emission reductions from personal vehicles and fuel costs can be a high energy burden for those in energy poverty. Many references to energy poverty thresholds and programs do not include the costs for transportation. Natural Resources Canada indicated that data was incomplete when it tried to assess the cost of transportation related to household income (Natural Resources Canada, 2020). The Rocky Mountain Institute in 2015 noted that transportation is a significant expense for households (RMI, 2015) and a study in Connecticut found that the mean annual spending on fuel used in personal vehicles was \$2,524 USD (4% of incomes in that jurisdiction) (VEIC, 2020). While a full assessment of transportation costs was out of scope for this report, it could be considered in future energy poverty efforts.

In addition, support for measures to adapt to climate change could also be considered. Structural upgrades, water diversion, and moisture-mitigation measures could help properties of low- to moderateincome households better withstand a future with a changing climate (higher winds, heavy rains, and significant snow and ice storms). While an in-depth review is out of scope for adaptation measures in this report, some programs already fund moisture-mitigation and water-management upgrades for indoor airquality reasons. Examples of these upgrades include bathroom fans and heat-recovery ventilators (to remove humidity from the home), rain gutters to divert water away from the home, and dehumidifiers to manage moisture levels. While these initiatives do not reduce energy bills, they improve the living conditions of the home, including the health of the building and its occupants. Additional climate change adaptation measures could also be considered in the future.

By building on Nova Scotia's leadership to address energy poverty, future efforts can continue to evolve and grow and will help the lives of many Nova Scotians.

Voices From the Community – North Preston's Future

North Preston's Future Community Organization Society began eight years ago to help address some of the barriers faced by the community. The organization serves as a resource that community members trust and provides assistance by helping connect people with and navigate through a variety of support programs.

"The African Nova Scotian community has faced discrimination for over 400 years," states the organization's founder and CEO. Discrimination continues today, and this includes barriers that exist as a result of discrimination that has existed for generations.

Many people in North Preston don't have a mortgage, but proof of homeownership is very low. This is because many of the homes were passed down to families over generations. However, there was never an appropriate system to establish home deeds and land title, so some residents cannot show proof of homeownership and participate in programs to assist them. While the land title and homeownership situation gained media attention years ago and a plan was made to address it, the issue still exists for some. "It can be a struggle to wake up in the morning and leave your community to work with others who are not like you, who do not understand you or your community.... When do we get to be part of this Province?"

Energy poverty has a big impact on some residents in the community. One story comes from a family who lives in social housing. While housing is provided, the family can't afford the heating bill. This is especially challenging for single moms with lower incomes. "It's simply not possible to provide for your kids and pay for all the required expenses (including heat) while making \$16 an hour. They can't give their kids grapes, apples, and healthy food because they can't even afford to pay for heat." Another example comes from a home where the windows are full of frost for much of the winter because the temperature in the house is so low.

"We are a close-knit community, and help each other," but sometimes this means people making a variety of sacrifices. Some people who can't afford heat and power sometimes move in with their relatives for the winter. This means that one home becomes quite crowded, and everyone must make sacrifices to help each other out. "This is 2023, and we're still so far behind, but it shouldn't be this way. Sometimes people ask themselves: Do I abandon the community, or do I stay here and continue to deal with all the barriers that come with it?"

There are many ways to improve the situation. This includes addressing land title and homeownership issues, and by learning from the community to better understand the issues and seek solutions. Working together is key. "We need to see what everyone can contribute, and then develop a plan so that everyone can benefit." At an individual level, it also includes understanding each person's specific situation and context. For example, if someone in need doesn't participate in a program meant to help them, ask them why. Talk to each homeowner and see why they didn't apply. "You can't assume, you need to know."

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Appendix 1 – Energy Poverty Dashboard for Nova Scotia

As indicated in the report, EfficiencyOne created an Energy Poverty Dashboard. This details the rate of energy poverty at a community level and for Nova Scotia as a whole. The dashboard can calculate how energy poverty rates change in the wake of fluctuating energy costs, median wage increases/decreases, and with the completion of energy efficiency upgrades. The dashboard explores poverty rates across electrically heated and non-electrically heated households down to the forward sortation area (FSA), the first three characters of a postal code. At the FSA level, it is possible to review data such as energy poverty rates, median and average wages (before and after-tax), home counts, ownership percentage, age of households, electric and non-electric sources of heating, and other variables related to energy poverty.

The dashboard uses an intelligent mix of datasets including:

- 2021 Environics DemoStats (an advanced data model licensed through Environics that provides detailed insights about the population and housing stock at various geographic hierarchies using years of Canadian Census data, Bank of Canada data, Canada Revenue Agency data, and other datasets). Environics DemoStats provide an accurate description of household incomes across the province as well as many other detailed geographical statistics. ©Environics Analytics, 2022.
- Nova Scotia Power energy consumption data (the raw bills and energy usage patterns as measured at each residential meter by Nova Scotia Power, updated monthly). This data allows for tracking direct electrical energy consumption for almost every residential household and apartment across the province as well as predicting whether the household is heated through electrical or non-electrical means.
- EnerGuide home assessment data (extracted from Home Energy Assessment and HomeWarming program pre-upgrade and post-upgrade assessments via Hot 2000 files). The EnerGuide Home Energy Assessment participants provides a dataset that allows for predicting the consumption of non-electrical energy sources (such as oil, wood, propane, natural gas) for non-electrically heated households.
- Property Valuation Services Corporation (PVSC) data. This gives high-level details, such as size and age, of residential buildings across Nova Scotia.

Accessing these datasets (along with some simple machine learning techniques and other statistical analytics) provides an overall view of energy poverty across the province at a granular level. The Energy Poverty Dashboard gathers and analyzes all this data and provides insights such as:

- Areas with the highest rates of energy poverty (percentage of households in a community experiencing energy poverty).
- Areas with the highest/lowest median wages.
- Energy poverty rate for non-electrically heated and electrically heated households.
- Energy poverty rate changes if the price of home heating oil rises or decreases.
- Energy poverty rate changes if the price of electricity changes.

Several other variables can be adjusted within the dashboard. For example, it is possible to:

• Adjust the threshold for energy poverty (6% of the median income is the default where that represents 6% of the after-tax household income).

- Change the median wage to see how an increase/decrease may affect energy poverty rates.
- Adjust the price of electricity per kilowatt hour.
- Change the price of oil and propane per litre.
- Modify the price of wood per cord.
- Vary the price of natural gas per gigajoule.

Based on the data sets, the following are a few Nova Scotia demographics:

- Occupied dwellings = 435,000
- Average age of residential building = 46.2 years
- Adjusted median household salary (after tax) = \$52,547
- Average annual household energy costs (all households) = \$2,920
- Households owned = 67.8%
- Households rented = 31.7%
- Households owned by First Nations = 0.6%
- Nova Scotia households that heat primarily with electricity = 43%
- Nova Scotia households that heat primarily with non-electric fuel sources = 57%
- Nova Scotia households in energy poverty = 43%
 - o 18% for electrically heated homes
 - 61% for non-electrically heated homes

This dashboard can be used for a variety of purposes. It demonstrates that energy poverty affects many households in Nova Scotia. This can be useful for government when assessing priorities, developing budgets, implementing new programs, and creating policies.

At an operational level, it can pinpoint specific areas in Nova Scotia that are in the greatest need, thus allowing for targeted efforts to help those that need it the most. In addition, it provides insights on the energy used in each community. For example, if there was a desire to focus on home heating oil, the tool identifies which communities have a higher reliance on non-electric fuels for heating. This dashboard is analogous to the beta version of the Climate and Economic Justice Screening Tool used by the United States government. Their tool identifies disadvantaged communities across all 50 states by considering eight different categories including energy efficiency, affordable and sustainable housing, and health burdens (United States Government, 2022).

It is hoped that the dashboard for Nova Scotia can be used as one tool to further assist those in energy poverty.