



# ENERGY POVERTY

AN ENERGY POVERTY STRATEGY FOR ALBERTA

R. BOYD AND H. CORBETT

All One Sky

— F O U N D A T I O N —

HELPING **ALL** PEOPLE PROSPER IN A CHANGING CLIMATE

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## ACKNOWLEDGEMENTS

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## SUMMARY

Energy poverty is the inability of financially strapped families to maintain adequate energy services at a reasonable cost. It affects one in seven Alberta households—those who spend more than 10 per cent of their disposable income on home heating, cooking and lighting.

Energy poverty takes its toll on health and wellbeing, particularly among the young, elderly, disabled and ill. It forces difficult choices between competing basic necessities such as heating homes or eating properly. It also impedes efforts to reduce Alberta's greenhouse gas emissions and meet its climate change goals.

To reduce energy poverty in Alberta, a holistic strategy is needed that targets its three main causes: unaffordable energy charges, low income and energy-inefficient houses. This requires a partnership approach, involving all Alberta organizations that can influence energy poverty outcomes. The overriding goal is to provide all Albertans with access to the energy services needed to achieve a comfortable and healthy life.

This strategy has been developed from information gathered at a November 2017 workshop in Edmonton attended by some 40 representatives from a wide range of stakeholders. It is intended to be a first step, followed by an implementation plan that identifies actions, timelines and available resources.

Strategic objectives for energy-poor households:

- promote behaviour change to use energy more efficiently and increase the energy efficiency of housing stock;
- reduce energy bills and help households take ownership of this process;
- increase household disposable income and improve access to stable, affordable, quality housing;
- improve information gathering to better design and monitor programs and cost-effectively target them to the most vulnerable;
- develop strong partnerships among many Alberta organizations, thus maximizing resources and leveraging opportunities for tackling energy poverty.

Actions that support the strategic objectives:

- develop and test a customized energy conservation program for energy-poor households;
- design and deliver energy-efficiency improvement programs at no cost to eligible households;
- offer households more flexible bill payment arrangements and design special rate structures and credits that address energy poverty.



**Energy poverty is a significant social problem affecting 1-in-7 households in Alberta, causing considerable hardship and negative health impacts, as well as impeding efforts to reduce greenhouse (GHG) emissions.**

## INTRODUCTION AND DEVELOPMENT OF THE STRATEGY

In October 2015, All One Sky Foundation published *Energy Poverty — An Agenda for Alberta*. This was a turning point in raising awareness of the unheeded problem of energy poverty in Alberta. Energy poverty refers to the inability of a household to maintain ‘adequate’ energy services at reasonable cost. It is a significant social problem affecting 1-in-7 households in Alberta, causing considerable hardship and negative health impacts, as well as impeding efforts to reduce greenhouse (GHG) emissions. Households living in, or on the brink of, energy poverty often face very difficult trade-offs between paying their energy bills, spending on other essentials such as food, and falling into debt — all of which can exacerbate physical and mental health disorders.

Whether an individual or family is in energy poverty is determined by the interplay between three factors: the energy efficiency of their home; energy prices/charges; and household income. Reducing the burden of energy poverty in Alberta will require action targeting all three factors. In addition, tackling energy poverty will require effective partnerships between the province, local government, housing, public health, environmental and energy services, and the voluntary and community sector. “Third sector” agencies are on the frontline dealing with the consequences of energy poverty, and thus play a crucial role to help identify, access, deliver and support action on energy poverty.

In November 2017, All One Sky Foundation and the Canadian Poverty Institute hosted an Energy Poverty Workshop in Edmonton, which was attended by approximately 40 representatives from environmental, public health and social service agencies, the government, and the anti-poverty and utilities sectors. This strategy has been developed from information gathered at the workshop. It incorporates ideas generated by those organizations in Alberta which deal with the causes and consequences of energy poverty, and that can lead and oversee action. The strategy also incorporates background research conducted to inform discussions at the workshop.

The strategy highlights the nature and extent of energy poverty in Alberta, drawing on the most recent available data. It identifies individuals and families who are particularly vulnerable to the effects of energy poverty. Actions to address energy poverty should be directed as a priority to those in greatest need.

The strategy sets out a vision for the future, along with desired outcomes. Several guiding principles are also stated. In support of the vision, strategic objectives are defined which, if effectively delivered, would see the vision achieved. The objectives target the main causes of the problem: low income, energy inefficient homes and high energy charges. The need for a partnership approach is stressed, involving all organizations in Alberta with the potential to influence energy poverty outcomes. An initial set of actions are identified to assist with delivery of each strategic objective.

The strategy does not, however, include an implementation plan for the identified actions, including resource needs, targets, timeframes, and lead and supporting organizations. It is intended to be a working document that will be further developed and revised over time based on feedback from key stakeholders, supplemental research, and learnings from actions taken.

## NEED FOR THE STRATEGY

The information provided in this section is intended to demonstrate the need for action on energy poverty in Alberta.

## WHAT IS ENERGY POVERTY?

Energy poverty refers to the inability of a household to maintain ‘adequate’ energy services at reasonable cost. By adequate, we mean a level of energy consumption in the home necessary to safeguard health and wellbeing. The term first emerged on the policy scene in the United Kingdom (UK) in the mid-1970s. Rapidly rising energy prices, due to the 1973-74 oil crisis, created serious difficulties for households on fixed, low incomes, and particularly for those residing in energy-inefficient homes that are expensive to keep warm. One of the main concerns was the detrimental effect of cold homes on health. Living in a poor-quality, cold home is linked with ill health—both physical and mental—and increased mortality risk. The young, elderly, disabled and long-term sick are especially vulnerable to these effects.

**“... [energy] poverty describes the problem by which a combination of poor housing conditions and low income means that the household cannot afford sufficient [energy] to achieve either adequate warmth for health and comfort or other energy services including for lighting, hot water and cooking.”** — Prof. Brenda Boardman, 2008

Energy poverty is a problem distinct from poverty in general. While there are links to wider poverty issues that have an impact on broader health and wellbeing, energy poverty requires a special focus because:

- not all low-income households are energy poor—e.g., low-income households living in energy efficient homes;
- it is associated with specific health conditions that have a more immediate impact on health outcomes than outcomes associated with wider poverty;
- options to address energy poverty are not just income-focused—home energy efficiency improvements are the primary course of action;
- capital expenditures—e.g., to improve the energy efficiency of dwellings—can have a major impact on reducing energy poverty, while addressing income poverty usually involves revenue expenditures (government transfer payments); and
- it is possible to effect change on energy poverty more rapidly than with approaches to tackle income poverty.

Energy poverty also has an important environmental aspect. Actions to alleviate energy poverty can contribute to wider efforts to combat climate change. Improving the energy efficiency of the housing stock—a mainstay of energy poverty strategies—is a necessary component of any cost-effective strategy to reduce greenhouse gas (GHG) emissions. Indeed, energy poverty should be viewed as a cross-cutting policy issue, with implications for general poverty alleviation, health and social wellbeing, housing and climate change strategies.

## SOME KEY FACTS AND FIGURES

While there is widespread agreement at a conceptual level that energy poverty refers to the inability of a household to maintain adequate energy services at reasonable cost, operational definitions of energy poverty can differ markedly in their construction, with significant implications for designing

“... a [energy] poor household is one which needs to spend more than 10% of its income on all [energy] use and to heat its home to an adequate standard of warmth.”

— UK Fuel Poverty Strategy, 2001

an effective strategy: for measuring the extent and depth of energy poverty, for understanding the composition of the energy poor, for targeting action at those who need it most, and for monitoring progress.

The extent of energy poverty in a local population is most often measured as the number of households spending more than an acceptable fraction of their income on home energy costs. For this strategy, **a household is considered energy poor if annual spend on all home energy services (i.e., space heating, space cooling, appliances, water heating and lighting) exceeds 10 per cent of its disposable income.**<sup>1</sup>

Determination of the ratio for each household should ideally be based upon modelled energy costs required to maintain a ‘satisfactory’ heating regime—i.e., to achieve thermal comfort levels that safeguard health and wellbeing.<sup>2</sup> Measuring energy costs based on required expenditures as opposed to actual expenditures, has the advantage of capturing observed under-consumption by low-income households. Research consistently shows that low-income households substantially under-spend on energy—foregoing a heating regime necessary to safeguard health and wellbeing to meet the costs associated with other necessities, such as food. For this iteration of the strategy, in the absence of modelled estimates of required energy costs, the assessed number of energy poor households in Alberta is based on actual expenditures from Statistics Canada’s Survey of Household Spending.

Whether a low-income household can afford energy costs for their home will depend on their disposable income. Hence, after-tax income is the appropriate starting point measure of income to use when calculating the ratio for a household. A case can also be made to omit housing costs from after-tax income—specifically, for the principal residence. A household cannot spend major fixed housing costs (e.g., rent, mortgage, insurance, HOA, property tax etc.) on energy services, any more readily than they can so spend income tax, which is excluded from disposable income. These housing costs are often (and especially for low-income households) non-discretionary and therefore do not

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<sup>1</sup> The 10% threshold was first adopted by UK Governments in the 2001 UK Fuel Poverty Strategy. At that time, this fraction was what the poorest 30% of households in the UK were spending on energy services for the home and, at twice the expenditure of the median household, was a threshold above which spending on energy was judged to be ‘disproportionate’. Many jurisdictions still use the 10% threshold to this day. Based on 2016 data, twice the expenditure of the median household in Alberta on home energy services equates to just over 7% of its disposable income. Hence, the 10% threshold adopted in this strategy will produce a conservative estimate of energy poor households.

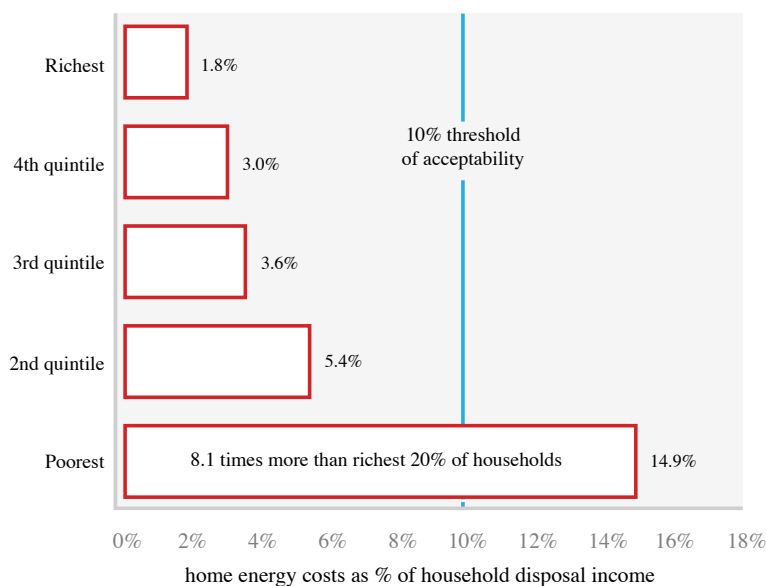
<sup>2</sup> This is generally defined as 21°C for the primary living areas and 18°C for secondary living areas, such as bedrooms.

constitute disposable income. The estimated number of energy poor households in Alberta is based on the disposable income of households, given by after-tax incomes less fixed housing costs for the primary residence.

The energy poverty ratio for Alberta households in 2016, by income quintile is shown in Figure 1. The home energy burden of an average household in the lowest income quintile (i.e., the poorest 20% of households) is clearly disproportionate relative to the burden experienced by other households in the province. As a fraction of disposable income, an average household in the lowest income quintile in 2016 spent just over eight times more on home energy services than an average household in the highest income quintile; and just over four times more than the average household in Alberta. As noted previously, the inequality is worse than the data in Figure 1 shows, given that low-income households will tend to consume less energy than required to maintain adequate warmth—instead diverting their limited disposable income to other necessities.

**The average poorest 20% of households in Alberta spent nearly 15% of their disposable income on home energy costs in 2016.**

**Figure 1: Energy poverty ratio for households in Alberta in 2016, by income quintile**



Source: R. Boyd calculations

Note: The “typical” household is the average household in the third (or middle) income quintile from the 2016 Survey of Household Spending.

Analyzing the energy burden of households within the income quintiles, conservatively, about 220,600 families (or 353,000 people) in Alberta were energy poor in 2016—that equates to roughly 1-in-7 families.

Certain groups in Alberta are more likely than others to find themselves suffering from energy poverty. Knowing these groups is crucial for targeting interventions. Table 1 provides some insight



**220,600 families (or 353,000 people) were energy poor in 2016, roughly 1-in-7 families.**

into those most vulnerable to energy poverty. Relative to a typical Alberta household, the energy poor are more likely to be: living alone without children, unemployed, elderly and renters. Additionally, disabled people and people with existing illnesses and long-term chronic (physical and mental) conditions will be more vulnerable to the impacts of cold, damp homes.

**Table 1: Characteristics of energy poor families**

	Energy poor household	Typical household
Average household size	1.6	3.0
Homeowners	40%	75%
Lone-person household	70%	45%
Of which, with no earner	60%	35%
One couple only	15%	35%
Of which, with no earner	35%	20%
Household with children	10%	15%
Of which, with no earner	35%	10%
With adult aged 65 or older	40%	20%

Source: Statistics Canada, Household Characteristics of Household Expenditure Survey

Note: The “typical” household is the average household in the third (or middle) income quintile from the 2016 Survey of Household Spending.

Energy poor households are also slightly more likely to be found in population centres than rural Alberta. Figure 2 presents data on population density and shelter costs as a percentage of income for 253 census sub-divisions in Alberta. Shelter costs are a reasonable proxy for the energy cost burdens experienced by households; home energy costs average about 11-13% of total shelter costs across all income quintiles. The solid red lines in Figure 2 indicate the median estimated population density (261 persons per km<sup>2</sup> across all sub-divisions) and the median proportion of all households spending more than 30% of their income on shelter costs (18% of total households across all sub-divisions). These lines divide Figure 2 into four quadrants:

- Quadrant “A” – lower density, higher proportions of households with high shelter cost burdens;
- Quadrant “B” – lower density, lower proportions of households with high shelter cost burdens;
- Quadrant “C” – higher density, lower proportions of households with high shelter cost burdens; and
- Quadrant “D” – higher density, higher proportions of households with high shelter cost burdens.

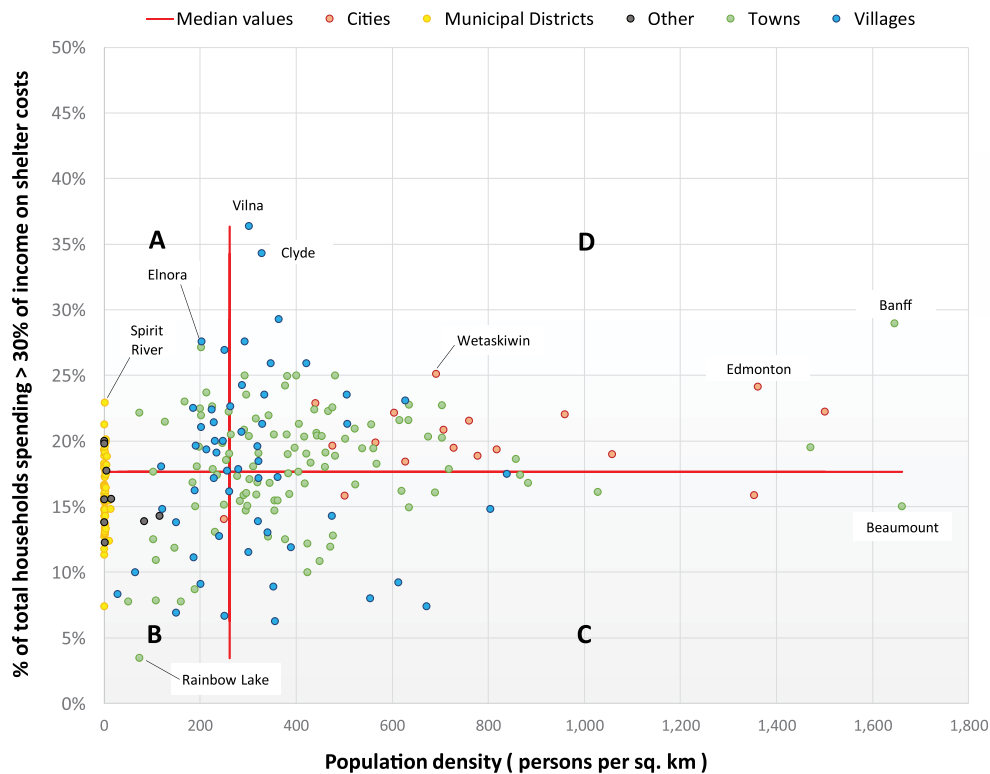
Interestingly, only 20% of all sub-divisions fall within quadrant “A”, with 31% falling within quadrant “D”. That is, a greater proportion of sub-divisions with higher than median shelter cost burdens may be classed as urban as opposed to rural. Equally, a greater proportion of sub-divisions with lower than median shelter cost burdens may be classed as rural as opposed to urban; 30% and 19% of all sub-divisions fall within quadrant “B” and quadrant “C”, respectively. Furthermore, looking solely at Municipal Districts, only 29% fall within quadrant “A”- the remaining 71% fall within quadrant “B”.

Hence, disproportionate shelter cost burdens—and by extension—energy cost burdens may be more prevalent in urban areas than rural areas in Alberta. This is particularly true with respect to renters.

**The peak in the number of energy poor households in 2014 coincided with peak residential natural gas prices, which were approximately 40% higher in 2014 than in 2012.**



**Figure 2: Shelter cost burdens in Alberta in 2016 – rural vs urban census sub-divisions**



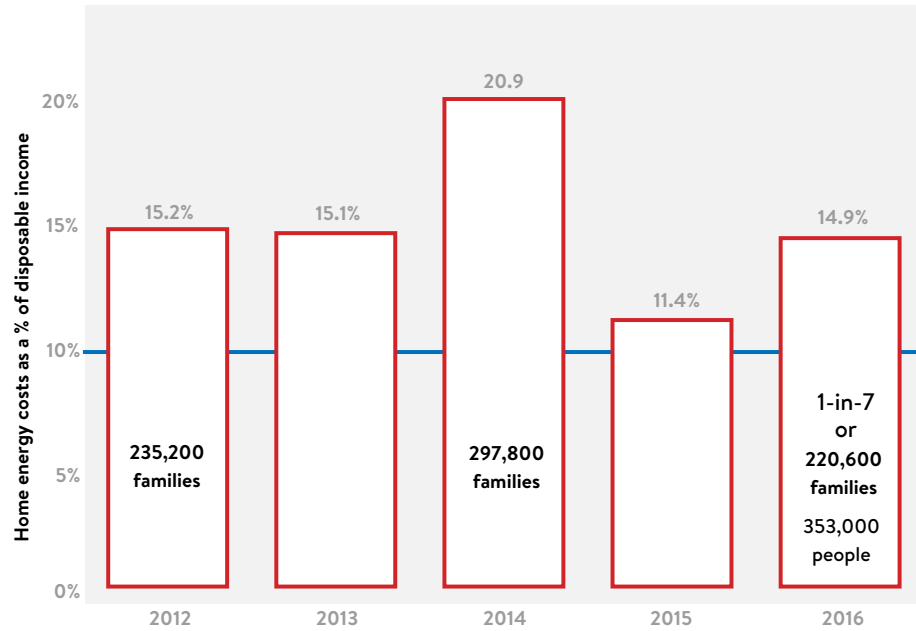
Source: R. Boyd calculations

The number of energy poor households in Alberta fluctuates from year to year. The energy poverty ratio for only the poorest 20% of Alberta households over the five-year period through 2016 is shown in Figure 3. In 2012 and 2013 the energy cost burden of the poorest households was like that in 2016—at around 15% of disposable income. The energy cost burden peaked at nearly 21% of disposable income in 2014—at which time about 297,800 families were energy poor—but fell to just over 11% in 2015.

The movement of families in and out of energy poverty reflects year-to-year changes in key determinants of home energy costs and household incomes, as shown in Figure 4. The peak in the number of energy poor households in 2014 coincided with peak residential natural gas prices, which were approximately 40% higher in 2014 than in 2012. Heating degree days—an indicator of demand for space heating—also peaked in Calgary and Edmonton in 2014.

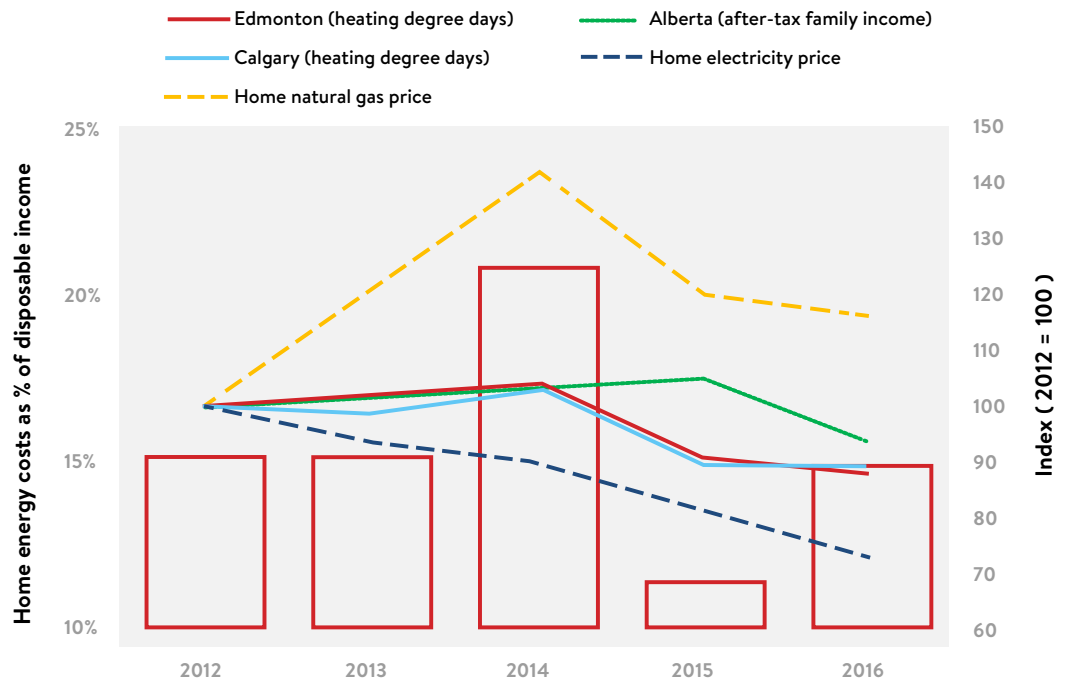
In contrast, the energy poverty ratio was lowest in 2015; coinciding with peak (after-tax) household incomes, the lowest space heating demands over the 5-year period, and residential natural gas prices 15% lower than their peak in 2014. The importance of household incomes on the energy poor headcount is evident in 2016. The energy poverty ratio increased from 2015 to 2016 despite falling energy prices and steady space heating demand, as (after-tax) household incomes fell by 10% as the economy contracted.

**Figure 3: Energy poverty ratio for poorest 20% of households in Alberta (2012-2016)**



Source: R. Boyd calculations

**Figure 4: Key factors influencing the energy poor headcount in Alberta (2012-2016)**



Source: R. Boyd calculations

Energy poor households adopt a variety of coping strategies; some ration their consumption (i.e., spend less than 10% or more of their income on home energy, and then suffer cold and damp homes). Some may spend 10% or more on home energy, but go without other essential goods and services, or go into debt. Others still, adopt a mix of strategies. Irrespective of the coping strategy, energy poor households will suffer adverse health and wellbeing consequences.

## EFFECTS ON HEALTH AND WELLBEING

There is a substantial and growing body of evidence that shows a strong association linking cold and damp homes, energy poverty, and the health and wellbeing of individuals. The evidence relates to mortality (pre-mature death) and morbidity (physical and mental illnesses and diseases) health outcomes, as well as wider social impacts that living in a cold home may cause for both children and adults.<sup>3</sup>

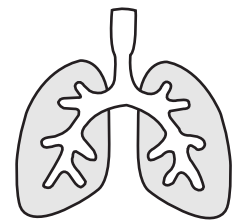
### Direct Physical Impacts

The link between living at cold temperatures and detrimental health outcomes is well established. The World Health Organization (WHO) recommends that indoor temperatures are kept above 18°C with increases of 2-4°C for vulnerable groups (e.g., elderly, long-term sick and disabled). The direct physical health effects of energy poverty and living at cold temperatures include:

- **Cardiovascular disease:**  
At living temperatures below 12°C blood vessels can constrict, resulting in a rise in blood pressure. This can lead to heart attack and stroke—especially in older people.
- **Respiratory illnesses:**  
Exposure to cold living temperatures reduces lung function, increases constriction of the airways (stimulating mucus production), and suppresses the immune system. These are all risk factors for triggering asthma attacks, pneumonia, and chronic obstructive pulmonary disease (COPD), such as emphysema and chronic bronchitis.

In addition, cold homes are more likely to be damp. This encourages the growth of mold, which can cause and aggravate respiratory illnesses. Children are particularly vulnerable to significantly increased risk of coughing and wheezing, and asthma attacks.

Energy poor individuals and families tend to spend more time indoors where they are more likely to be near one another (see below). This can aid the spread of contagious illnesses, such as influenza. Furthermore, living in cold temperatures can delay recovery from these illnesses.



The direct physical health effects of energy poverty and living at cold temperatures include cardiovascular disease, respiratory illnesses, low weight gain in infants, increased hospital admissions for infants, unintentional injuries, and even death.

<sup>3</sup> When considering the evidence, it is important to note that energy poverty and cold housing are used synonymously, with most of the evidence linking poor health and wellbeing outcomes to living at low temperatures and not to energy poverty per se. But there is compelling evidence that the drivers of energy poverty (the interaction between low income and high utility bills) are strongly associated with living in low temperatures.

- **Low weight gain in infants:**

There is a relationship between living in cold homes and poor weight gain in infants, attributed to the fact that infants living in colder homes need greater calorific intake to keep warm and maintain normal growth and development. Detrimental effects on child development are long-term and may not be reversed in adulthood.

- **Hospital admissions for infants:**

Infants living in colder homes have been observed to be at greater risk of admission to hospital or primary care facilities than the general population.

- **Unintentional injuries:**

Living in cold homes affects mobility and increases the likelihood of unintentional injuries, primarily because: symptoms of arthritis and rheumatism worsen in cold, damp homes; and strength and dexterity decrease as temperatures drop, increasing the risk of accidents. Older people are most vulnerable to injuries from falls.

- **Deaths:**

Living at cold temperatures has been linked to fluctuations in seasonal mortality rates—specifically, excess winter deaths.<sup>4</sup> Analysis of monthly death rates for Alberta over the period 1991-2011 reveals a pattern consistent with the presence of excess winter deaths, with higher death rates in winter months compared to non-winter months. The average monthly death rate during non-winter months is about 49 deaths per 100,000 persons. The monthly death rate is just over 13 per cent higher (or close to 56 deaths per 100,000 persons) during winter months. This translates into just over 820 excess winter deaths per year in Alberta.

In the UK, where excess winter deaths have been studied extensively, circulatory diseases (including heart attack and stroke) account for 40% of excess winter death; a third are caused by respiratory illnesses. Deaths directly attributed to influenza or hypothermia account for only a small fraction of excess winter deaths, though influenza compounds the risk of death from circulatory and respiratory illnesses in winter. Of note, living in cold homes is believed to be a significant contributing factor to the increased incidence of respiratory and circulatory diseases during winter months. The largest single group affected is the over-65s; the over-85s are worst affected.

## Beyond Direct Physical Impacts

The environment in which people live and how they feel about it unquestionably has an impact upon their mental and emotional wellbeing. It is therefore not surprising that energy poverty and living at cold temperatures is linked with several direct detrimental effects on the mental health of all age groups.

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<sup>4</sup> Excess winter deaths are seasonal variations in deaths, typically defined as: the difference between the number of deaths which occur in winter (December to March) and the average number of deaths during the preceding four months (August to November of the previous year) and the subsequent four months (April to July of the current year).

Excess winter deaths were one of the primary concerns when the phenomenon of energy poverty first emerged in the UK in the 1970s.

- **Common mental disorders:**

Households living at low temperatures are more likely to be stressed. The cold causes physical discomfort directly, which can be distressing, and high stress levels increase the risk of common mental disorders like anxiety and depression.

- **Heat or eat:**

Energy poor individuals and families may trade off other necessities to keep warm, the most dramatic of which may be to “heat or eat”. There is evidence that the poorest households (and particularly the over-65s) reduce expenditure on food to pay for additional heating in winter. Not only is this linked to poor nutrition, but the trade-offs are also a source of stress.

Compounding matters, stress, anxiety and depression all lower people’s capacity to resist other cold weather-related illnesses, leading to a vicious circle of health risks.

Energy poverty and the day-to-day experience of living in cold housing can also indirectly affect people’s mental state by influencing their lifestyle choices, the opportunities available to them and their relationships with others. The main indirect mental health-related effects are:

- **Risk-taking behaviours:**

People living in energy poverty may only heat a limited number of rooms (e.g., the living room). This can lead to overcrowding and a feeling of being “unhappy with family life”. This is associated with various risk-taking behaviours (early alcohol and tobacco use) and trouble with the police among adolescents, as they seek privacy outside the home.

Energy poor households are also more likely to turn to unsafe heating practices—e.g., heating their home with an open oven door or (faulty) electric heater. Supplemental heating has been linked to a significant number of residential fires and deaths in the United States each year. It is also associated with detrimental health effects due to exposure to poorer indoor air quality.

- **Educational attainment:**

Increased duration of living at cold temperatures is associated with detrimental effects on children’s learning because of having no warm and quiet place to study or the need to take time off school due to cold-related illness. Affected children are also more likely to be skip school or be suspended from school.

- **Social isolation:**

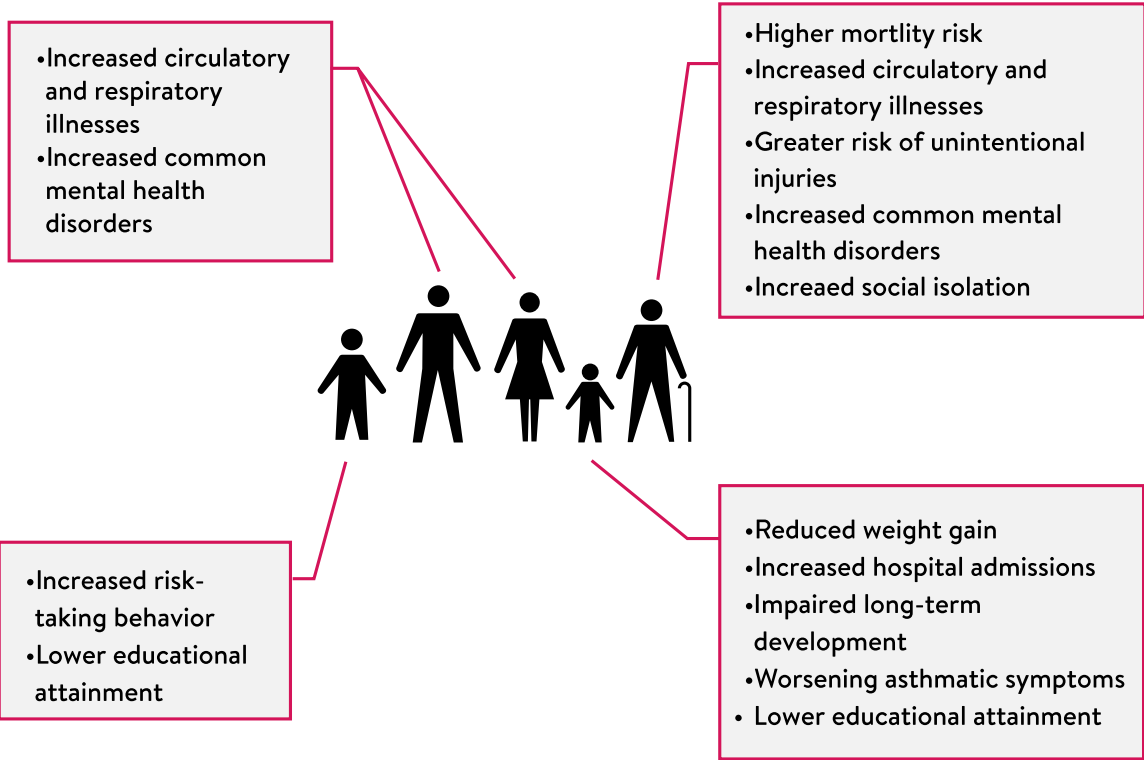
Living at cold temperatures is linked to social isolation among adults. There is a social stigma attached with living in cold, poor-quality housing, which makes people reluctant to invite friends and family into their home. The same people will also have limited options for going out due to reduced disposable income. Even if going out was possible, during winter months they fear returning home, already feeling cold from being outside. Increased social isolation can adversely affect mental health and well-being; social isolation is a risk factor for depression.



**Energy poor individuals and families may trade off other necessities to keep warm, the most dramatic of which may be to “heat or eat”.**

Potential adverse health and wellbeing impacts on families living in energy poverty are summarized in Figure 5.

**Figure 5: Energy poverty affects the health and wellbeing of all family members**



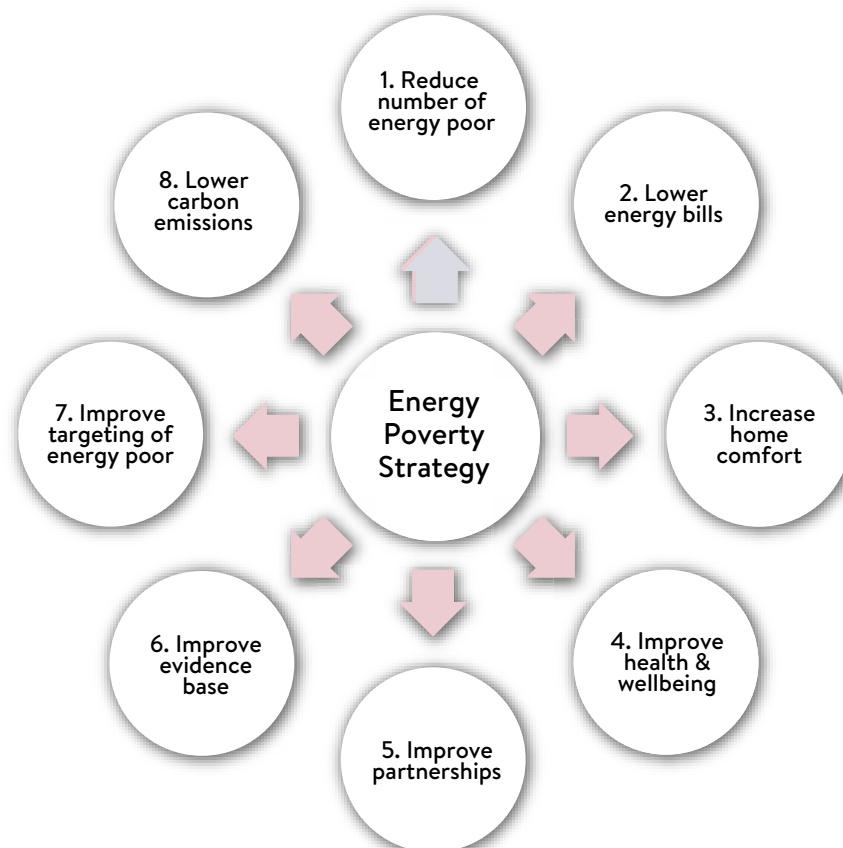
## VISION

**OUR VISION: We have a shared responsibility to ensure that all Albertans have sufficient access to energy services, through the supply and affordability of energy and energy resources, to achieve a comfortable and healthy lifestyle.**

How the strategy will achieve this vision is guided by five core principles:

- promote a strong collaborative approach with shared responsibility to tackle energy poverty;
- prioritize cost-efficient, local interventions;
- address all drivers of energy poverty—incomes, home energy use, and energy charges;
- maximize alignment across anti-poverty, housing, public health and climate change mitigation policy themes; and
- emphasize inclusive solutions to create a fairer and more equal society.

The desired outcomes of the energy poverty strategy are to:



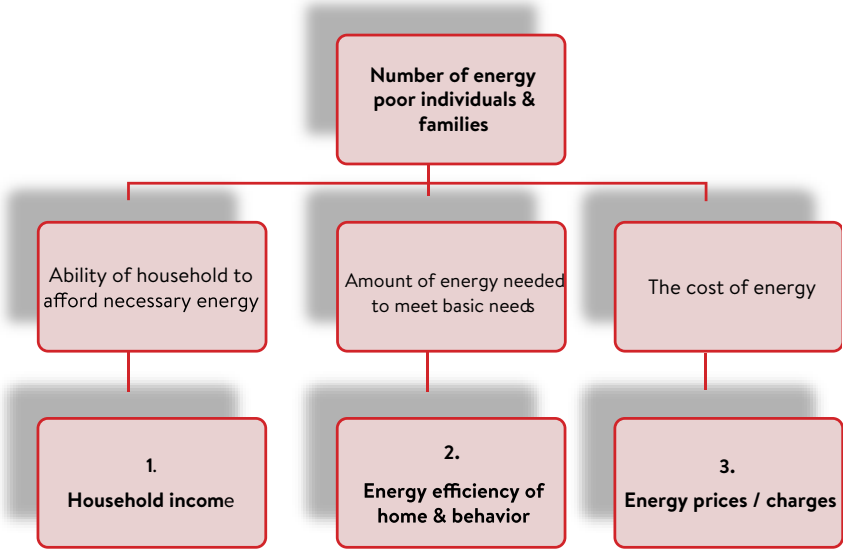
Reducing carbon emissions is a key co-benefit to reducing the number of energy poor households.

The first five outcomes flow directly from the vision. Improving the evidence base and targeting are key pieces of the strategy. A crucial first step that needs to be taken to efficiently reduce the number of energy poor households in Alberta is to accurately, and consistently, identify and target energy poor households—particularly, the most vulnerable individuals and families.

Reducing carbon emissions is a key co-benefit to reducing the number of energy poor households. With improvements in energy saving behaviours and the energy efficiency of the building stocks for these households, this strategy can not only improve comfort and wellbeing, but also make gains towards Alberta’s environmental and climate change goals.

### STRATEGIC OBJECTIVES

According to *Energy Poverty – An Agenda for Alberta*, there are three core factors that determine whether a household is energy poor:

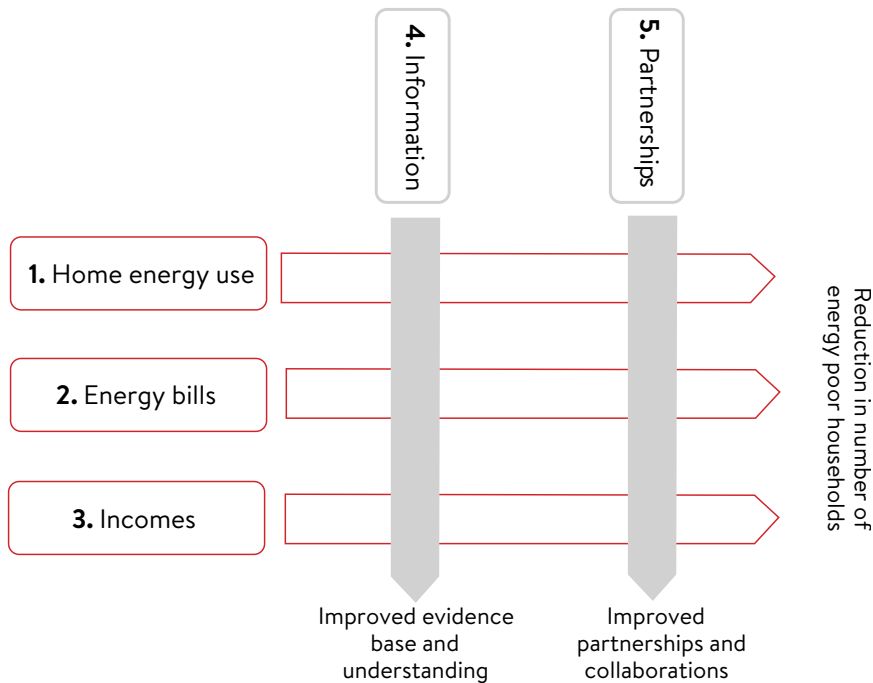


The three factors are highly interconnected. The energy efficiency of a dwelling determines how much natural gas and electricity is needed to adequately heat it and provide other energy services, which in combination with applicable energy charges determines home energy costs. The ability of residents to afford these costs is determined by household income. All other things being equal, the number of energy poor will increase if (a) household incomes decline, (b) energy prices / charges increase, or (c) the energy efficiency of homes deteriorates. Conversely, the number of energy poor will decrease if (a) household incomes increase, (b) energy prices / charges decrease, or (c) the energy efficiency of homes improves.

In support of our vision, five strategic objectives have been developed, which if effectively delivered, collectively will see the vision achieved.



Our strategic objectives are stated below and are based on a need to fully understand who is vulnerable to energy poverty, their circumstances, where they are, and how to effectively target them with meaningful interventions that tackle the three main factors that determine whether a household is energy poor:



Each of the first three strategic objectives addresses a specific cause of energy poverty:

1. energy use in the home—influenced by both the energy efficiency of the home itself and the energy consuming behaviour of occupants;
2. energy bills, including electricity and natural gas prices (rates) and other charges; and
3. disposable household incomes.

Regarding the first objective, this strategy adopts a person-centric rather than property-centric approach, by targeting both the energy behaviour of occupants and the energy performance of homes.

Action on objectives 1-3 will *directly* reduce the number of energy poor individuals and families in Alberta.

Two cross-cutting objectives are also included in the strategy, around:

- Identifying and gathering germane information to improve our understanding of the issue and the evidence base from which to formulate effective interventions; and

- Establishing and maintaining strong partnerships across all organizations with the capacity to influence energy poverty outcomes.

Both these cross-cutting objectives are recognized as crucial to the success of the strategy.

### **1. Energy use in the home**

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In terms of energy use, the objective of the strategy is to promote behaviour change among energy poor households to use energy more efficiently. At the same time, the strategy should increase the energy efficiency of the housing stock of the energy poor across all tenures, targeting the most vulnerable individuals and families.

### **2. Energy bills**

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Broadly, the objective of the strategy is to reduce energy bills. Part of that process should involve supporting energy poor households to manage their energy bills and take ownership over reducing them.

### **3. Household incomes**

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The objective of the strategy is to increase the disposable income of energy poor households, and to improve access to stable, affordable and quality housing.

### **4. Information gathering**

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To implement a successful strategy, a clear picture of energy poverty and the resources available to reduce it needs to be formed. An objective of the strategy is to gather information to these ends. This involves:

- Improving the evidence base used to inform the design of interventions;
- Identifying (and finding a reliable, cost effective means to do so) energy-poor households to be able to cost-effectively target interventions to the most vulnerable; and
- Developing a comprehensive community-based evaluation and monitoring plan.

Together, these steps will help improve awareness and understanding of energy poverty in Alberta.



## 5. Partnerships

Developing strong partnerships is a critical part of an effective energy poverty strategy. Many organizations across Alberta have different resources that, when pooled, would make a wider range of effective solutions feasible:



An objective of the strategy is thus to build and cultivate strong partnerships among these actors, by:

- developing and consolidating collaborations between organizations with the capacity to influence energy poverty outcomes;
- fostering strong local leadership; and
- maximizing resources and leverage opportunities for tackling the causes of energy poverty.

## ACTIONS

A preliminary set of actions to support delivery of each strategic objective is provided below. Many of these actions should be taken in tandem, as the objectives should be pursued concurrently. While interventions to enhance incomes and lower energy bills can contribute to the eradication of energy poverty, it is actions to reduce home energy use that are the most sustainable—i.e., provide long-term reductions in the number of energy poor households—because:

- an improvement in the energy efficiency of a home will, by its capital nature, have a permanent (or at least very long-term) effect; and

**Ongoing energy bill and income support will be needed during the transition to a more energy efficient housing stock for the energy poor.**

- the improvement, by the nature of its durable, long-term effect, will protect both current and future (prospective energy poor) individuals and families from increases in energy prices / charges or reductions in income.

Furthermore, in contrast with interventions to increase incomes or reduce energy prices / charges, only reductions in home energy consumption contribute to climate change mitigation goals.

Interventions to reduce home energy use, nevertheless, are unlikely to reach all energy-poor households any time soon; it will take years. Ongoing energy bill and income support will be needed during the transition to a more energy efficient housing stock for the energy poor. Moreover, some individuals and families may experience financial hardship, and still need emergency financial support for their bills, even when they have already received home energy efficiency improvements.

In line with our guiding principles, a cost-effective and sustainable strategy to tackle energy poverty in Alberta should therefore have at its core three elements:

1. As a priority, actions to increase the energy efficiency of energy-poor households over time, starting with those most in need (i.e., households in severe or extreme energy poverty, or at greatest risk to adverse health and social impacts);
2. The provision of advice and tools to enable behavioural change to reduce energy wastage, especially in energy-poor households with relatively high energy consumption. Advice should also cover:
  - budgeting and money management;
  - income maximization (ensuring people claim all the financial support to which they are entitled); and
  - how to select the best energy tariff;
3. For those households unable to afford satisfactory energy services, during the transition to a more efficient housing stock or because of financial emergencies / hardship, the ongoing provision of energy bill and income support (financial or otherwise). In the longer-term, the need for energy bill or income support will generally decline, as increasingly more homes of the energy poor households are upgraded.

The success of the strategy also depends crucially on precise targeting of the interventions, making maximum use of available information and evidence.

The actions listed below provide a starting point for achieving our five strategic objectives; further interventions will need to be crafted by partners in the strategy. In addition, outputs, targets, resources, timeframes, and lead and supporting organizations for each intervention are still needed for the strategy to be implemented.

## GENERAL ACTIONS

Several actions benefit all strategic objectives. Importantly, a review of the eligibility and requirements for all existing or planned income, energy bill and home energy use program offerings would ensure that energy-poor households are being efficiently identified and targeted by partners. This could include, for example, ensuring that access to one program does not preclude someone from accessing another program—offered by a different partner(s). Equally, aligning and streamlining program offerings—and particularly, outreach services—would allow partners to reach vulnerable individuals and families more efficiently and consistently. Program providers could collaborate to cross-promote the resources they are able to provide to maximize impact on energy-poor households; they could also look to establish a system whereby individuals and families can be directly referred (or automatically enrolled) across programs.

Aside from reviewing program eligibility and program outreach, action should be taken to pull in more partners with the potential to influence energy poverty outcomes. Action is needed to engage private landlords and building owners to be a part of the solution, and to build capacity in our communities to support efforts to address the issue.

## INTERVENTIONS ON HOME ENERGY USE

The energy performance of homes and the energy use of occupants both affect the energy burden faced by households. For a house to efficiently use energy to meet occupant demands, it needs to meet basic building, equipment and appliance standards. At the same time, there are behaviours

that households can develop and adopt that allow them to further manage their home energy use. If energy poor households can access support to both develop their consumption habits and improve the energy efficiency of their homes, they should see reductions in their energy bills.

**“...policies that improve the thermal efficiency of dwellings tend to be more cost effective for addressing [energy] poverty compared to policies that are focused on subsidizing energy costs or increasing incomes.”**  
[Hills, 2012]

Improving energy use / home energy performance in energy poor households requires action in the following areas:

- **Outreach and education:**

Develop and test / pilot a customized energy conservation program for energy poor households. Energy conservation behaviours by individuals can have a significant impact on the total amount of energy used in the home. Households decide how warm (cool) to keep their home in the winter (summer), whether to leave lights and appliances on or to turn them off, what water temperature to wash their clothes, etc. In short, they make decisions about how to use most household energy systems.

Energy poor households have energy end-use characteristics that differ from those of the general population. Hence, for programs to be effective, they need to be customized to take these unique characteristics into account.

Many existing low-income energy efficiency programs include energy education and outreach designed to motivate energy conservation behaviours. These programs should be studied to identify best practices and lessons learned, including which delivery mode, delivery setting, degree of personalization, and delivery personnel would be most effective for Alberta's energy poor.

When developing the program, it is important to recognize that information comes from many sources already, and it should be the case that consistent and regular messaging regarding the same energy saving behaviours is repeated by government departments and agencies, energy utilities, health and social care professionals, social housing providers, and the voluntary sector. Similarly, it is important that such messaging (and any educational or promotional materials) be available in languages other than English.

Advice on energy conservation behaviours should be offered in tandem with information and advice relating to budget and money management, as often the two go hand in hand.

The targeting of energy conservation programs is considered below, under information gathering.

- **Improving home energy performance:**

**Programs should be designed to provide home energy efficiency improvements at no cost to eligible households.**

Design a portfolio of coordinated energy efficiency program offerings for energy poor households. Programs are needed to help energy poor households with both 'basic' improvements (e.g., weather stripping, door sweeps, pipe wrap, programmable thermostats, low-flow faucets and showerheads, energy efficient light bulbs, etc.) and 'deep' improvements (e.g., enhanced attic, ceiling and wall insulation, high efficiency furnaces, water heaters, windows and appliances, low-flow toilets, solar water heaters, etc.).<sup>5</sup>

Programs should be designed to provide home energy efficiency improvements at no cost to eligible households. Furthermore, they should be available to all segments of the low-income (single-family and multi-family) housing spectrum—including providers and occupants of assisted and affordable housing, owners of privately owned buildings that have low-income tenants, and private home owners. Priority setting within these segments, can be informed by research relating to the cost-effective targeting of support for energy poor households (see below).

Home energy efficiency programs should be coupled with other programs and interventions supporting energy poor households, including (separate) energy conservation education programs, income support interventions and measures to assist with energy bills. At a minimum, program providers should provide participating energy poor households with information about all relevant support and how to access it.

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<sup>5</sup> Basic home improvements are inexpensive and easy to install, and require no formal energy assessment. Extended upgrades, in contrast, are more expensive and complex to install. The selection of extended upgrades for a dwelling is usually based on a formal energy assessment. Installation also requires specialized training. Extended upgrades do, however, provide greater energy (bill) savings.

- **Program screening criteria:**

Several factors make energy efficiency and (behaviour) conservation programs for low-income households relatively costly—e.g., the need to fully subsidize the installation of energy saving measures, and overcoming the unique challenges associated with identifying and communicating with low-income energy consumers, which requires increased cooperation with local social service agencies and the development of linguistic and culturally appropriate materials. Consequently, programs for energy poor households often have low or negative Total Resource Costs or Societal Costs (two metrics used to assess the business case for funding a program). Given the unique challenges faced by programs for energy poor households, the standard Total Resource Cost or Societal Cost tests should be modified. Also, the non-energy (ancillary) benefits of low-income programs should be monetized and included in measures of Total Resource Costs or Societal Costs; the non-energy benefits generated by low-income programs are significant relative to the non-energy benefits of general residential programs. Their omission thus distorts the allocation of resources across the portfolio of energy efficiency and conservation programs for the residential sector. Research is needed to generate measures of non-energy benefits for low-income programs applicable to Alberta.

## INTERVENTIONS ON ENERGY BILLS

There are opportunities to make improvements to every aspect of the energy bill experience for energy-poor households. This ranges from understanding the bills and how to manage them, through customer service arrangements, to the kind of energy they are paying for. The broad categories below capture a range of different interventions to reduce energy bills.



- **Understanding the bill:**

Develop an education program(s) on energy bill literacy (in tandem with general financial planning and management) and user empowerment, and expand existing programs on these topics with dedicated help and materials for energy poor households. Often, even an understanding of the customer service available to help with bill payments can make a difference. Education materials should be developed in languages other than English, and tailored for different ethnic groups.

**There are opportunities to make improvements to every aspect of the energy bill experience for energy poor households.**

- **Making payments:**

Offer energy-poor households more flexible and tailored customer service and bill payment arrangements; this can prevent energy payments from threatening the financial security of energy-poor households. For example, energy providers could allow qualified customers to pay their annual payments in 12 equal monthly instalments. Rules governing disconnections, security deposits, and the collection of bills in arrears can also be adjusted to reduce stress and financial burdens on energy poor households.

- **Special rate structures:**

Investigate the case for using special rate structures in Alberta to address energy poverty; a variety of alternative structures could be considered. For instance, fixed cost charges could be reclassified as

variable charges, thereby benefiting households with lower energy usage, increasing the flexibility of (discounted) rate setting for vulnerable consumers, and promoting the aggregation and bulk purchasing of energy to reduce costs to consumers.

In addition, specific rates could be designed for qualifying, energy poor customers, such as lifeline rates or inverted block rates. Lifeline rates charge energy poor households a lower (discounted) amount than standard rates. Inverted block rates charge an initial block of consumption (up to a threshold) at a lower rate than the subsequent block of consumption (beyond the threshold). Both allow energy poor households, with typically lower than average energy use, to see a reduction in energy bills. Finally, a separate rate class all together could be established for energy poor households, distinguishing them from other residential customers.<sup>6</sup>

- **Bill credits and subsidies:**

Develop and implement an appropriate system of bill credits for energy poor households (which would reduce the burden of fixed charges, commodity charges, and service charges). For example, monthly credits could be applied directly to the bills of eligible households, based on a sliding scale reflecting need (e.g., using occupancy or household size as a proxy). Bill credit could also be distributed as emergency relief managed by utilities. The relief could be paid out from a dedicated fund, capitalized by a tax, a rate, the carbon levy, customer donations, other means, or in combination. Relief could be given to households experiencing ‘unusual’ hardship, eligible vulnerable households during the winter months, or to these vulnerable households throughout the year.

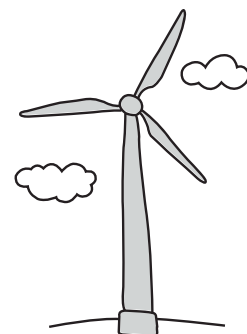
If rates are subsidized through such a mechanism (or similar), consideration should be given to coordinating it with the distribution of other subsidies and other support systems already provided to low income households, such that individuals and families are targeted in a coordinated manner and they have access to all available subsidies through one portal or agency. At a minimum, the identification of eligible households should be aligned and work in partnership with existing programs, such as Fair Entry and Bissell’s Community Bridge Fund.

- **Alternative energy:**

Investigate the potential to use alternative energy sources to address pockets of energy poverty in specific locations. For example, pursuing (suitably financed) opportunities to provide increased access to renewable energy, such as rooftop solar and other kinds of onsite generation for multi-family social / affordable housing projects, has the potential to reduce energy bills. These systems could be built in the form of district energy systems in low-income neighborhoods.

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<sup>6</sup> Energy Poverty – An Agenda for Alberta. R.Boyd and H.Corbett. 2015.





## INTERVENTIONS ON INCOMES

Improving the incomes of energy-households is complex, because assistance can come in the form of specific and targeted actions, such as one-off payments directly to eligible households, or through wider macroeconomic improvements that reduce unemployment or increase income levels generally. Incomes are influenced most by levels of employment and wages, and the levels of benefits and their take-up by those entitled to them. Levels of employment and wages are influenced by an array of macroeconomic policy levers.

When it comes to maximizing incomes generally, consideration should be given to the following options as means to affect more long-term change to household incomes:

- develop and pilot a universal basic income program;
- investigate options to increase access to long-term employment opportunities; and
- initiate measures to improve low-income individuals' understanding of basic career-life processes and skills development.

Specific actions to support the incomes of energy poor households include:

- **Benefits awareness:**

It is likely that some energy poor households are not claiming their tax refunds and pension, employment insurance and child-tax benefit payments. In 2014, Public Works Canada said it possessed unclaimed amounts totally more than \$730 million from these transfer payments.<sup>7</sup> A lack of awareness and absence of networks to inform potential claimants of their benefit entitlements is one of several suggested reasons for the poor distribution of these transfers.

To help the energy poor maximize incomes, a questionnaire to check whether people claim all financial support they are entitled to should be delivered to households in tandem with their participation in home energy efficiency programs. (Similarly, as suggested above, individuals and families receiving government transfer payments should be automatically referred to providers of appropriate energy efficiency programs.)

- **Affordable housing:**

Increase the number of affordable housing options (by eliminating existing barriers and disincentives to establish more attractive market conditions for suitable rental housing) and improve access to affordable housing through enhanced rent / income supplements. This would allow energy poor households to shift money they spend on rent towards paying for satisfactory energy services (and other basic needs).

Options should also be investigated to preserve existing affordable housing properties; the loss of existing affordable housing units would undermine efforts to create new affordable housing properties.

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<sup>7</sup> Ottawa Sitting on \$730 Million Stockpile of Uncashed Tax Refunds and Other Government Cheques (Financial Post). R. Marowitz, July, 2014.

- **Income-based assistance:**

Coordinate actions to reduce energy bills with existing general poverty reduction strategies. For example, one-off payments to eligible households to reduce the burden of (winter) energy bills could be means-tested—tied to the provision income-related benefits to eligible households.

## INTERVENTIONS TO FILL INFORMATION GAPS

To further develop, prioritize, effectively target and ultimately implement interventions contained in the strategy, better information is needed to: (a) improve our understanding of the issue—who are the energy poor, who are the most vulnerable, where do they reside, what impacts are of greatest concern etc.; and (b) improve our knowledge of best practices to address the problem.

As part of a community-led monitoring and evaluation plan, better information is needed to establish an accurate set of baseline indicators to measure the impact of interventions in achieving our vision and objectives.

The following actions, which are inter-related, should be taken to improve the information base:

- continue with the Energy Poverty Roundtable and expand its membership. The initial priority of the Roundtable should be to continue consultations with all actors who have the capacity to influence energy poverty outcomes, with the specific purpose of collating and synthesizing all relevant information needed to operationalize the strategy. The Roundtable could also lead several of the tasks below;
- conduct a cross-jurisdictional scan of best practices to eradicate energy poverty. Understanding what other jurisdictions are doing successfully will help inform which of the actions identified above might be most impactful, and which additional interventions are needed;
- develop and test a reliable and cost-effective method(s) to identify / target energy poor households, and those most in need. This will involve first resolving the following questions relating to how energy poverty is defined:
  - o Should consideration be given to alternative formulations of energy poverty (e.g., the low-income, high-cost indicator), other than the energy poverty ratio?
  - o If using the energy poverty ratio, should the threshold percentage be determined relative to the median energy cost to income ratio for all households, with its value changing over time, or be a fixed, absolute threshold, such as 10% of income, or an alternative numerical threshold?
  - o Should the definition be expanded to include other utility services, such as water bills?
  - o Does the definition need to maintain coherency across related policy areas, and if so, how?
  - o Should the definition enable differentiation between ‘classes’ or ‘levels’ of energy poverty (i.e., measure the depth of energy poverty experienced by households)?



- o Does the definition need to vary to reflect the different circumstances of rural, urban, and Indigenous households, as well as differences between renters versus home owners, seniors versus young families, new immigrants to Canada; and if so, how?

Conduct a cross-jurisdictional scan of best practices for targeting energy poor households, and sub-groups of these households, that are used in other jurisdictions and could be adapted for application in Alberta (e.g., benefits proxies versus area-based or neighborhood-based approaches, and other data-matching approaches to ‘pin-point’ interventions).

In support of identifying / targeting energy poor households, develop mechanisms for municipal government, utilities, energy efficiency providers, the AHS and other social service agencies for data sharing, and establish links between data sets created and those already managed by Statistics Canada.

- Construct a data management system to capture and share relevant information, including baseline indicators, to support partners with their efforts to address energy poverty, including monitoring and evaluating progress with the strategy, and establish a schedule / plan for data collection.

## INTERVENTIONS TO BUILD PARTNERSHIPS

Establishing and maintaining strong partnerships across all organizations with the capacity to influence energy poverty outcomes is crucial to the success of the strategy. Forming partnerships expands the (financial, human, social and institutional) resources available for the strategy. Reaching out to partners is also a key step in forming a coalition of organizations who can take responsibility for implementation.

Some steps can be taken on an ongoing basis to strengthen needed partnerships, such as:

- promote a better understanding of energy poverty (and the case for action) across partners;
- provide training to all relevant partners on how to identify energy-poor households;
- create and implement a local referral network to appropriate sources of support, which all frontline workers are aware of, and trained to implement;
- establish community hubs in priority areas, to provide a variety of joined-up programs and services; and
- generate strong local leadership among partners.

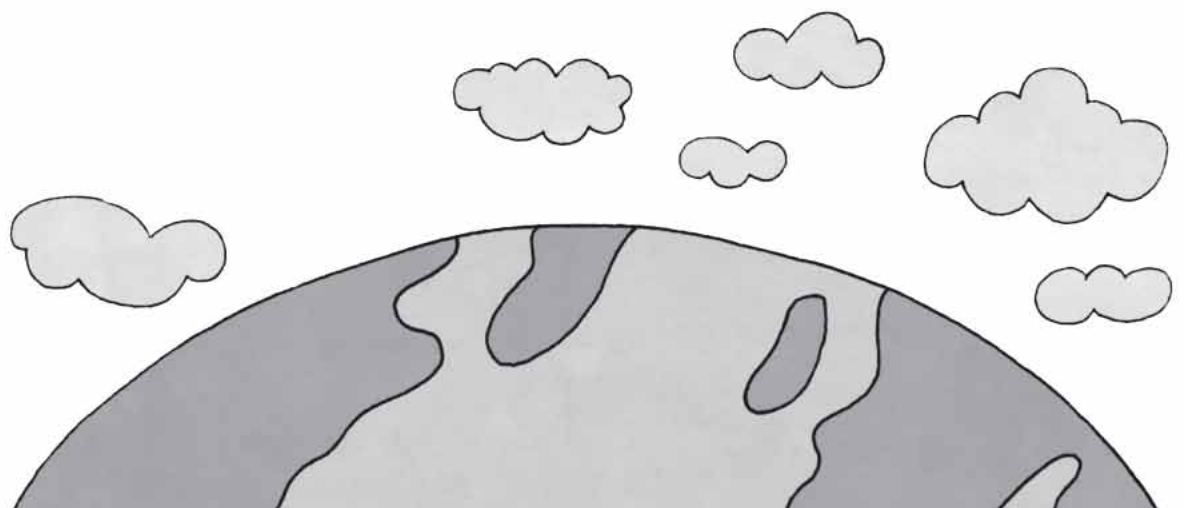
As the strategy moves toward implementation, the following steps regarding partnerships are more urgent:

- establish an implementation team or coordinating task force; and
- identify leaders among partners to support implementation.

The implementation team and leaders can oversee the process of crafting and resourcing a coordinated implementation plan.

**Establishing and maintaining strong partnerships across all organizations with the capacity to influence energy poverty outcomes is crucial to the success of the strategy.**





All One Sky

— F O U N D A T I O N —

**ALL ONE SKY FOUNDATION** is a not-for-profit, charitable organization established in 2010 to help vulnerable populations at the crossroads of energy and climate change. We do this through education, research and community-led programs, focusing our efforts on adaptation to climate change and energy poverty. Our vision is a society in which **ALL** people can afford the energy they require to live in warm, comfortable homes, in communities that are able to respond and adapt to a changing climate.

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