U1 Align Energy Efficiency Programs with State's Climate Goals

Target	• Ensure energy efficiency programs align with other policies such as HB 2021 and CPP • Ensure demand response programs delivery and enable GHG emissions reductions

Note: This policy was not assessed quantitatively; a qualitative assessment of the policy has been undertaken using the same framework. This assessment is based on our understanding of the policy intention and our best assessment of its impacts.

Indicators

1. GHG emissions	↓ Decreases emissions	Aligning energy efficiency programs with GHG emissions reductions will reduce emissions
2. Economic impact-lifecycle abatement cost	↑ Costs money per ton of emissions reduced	Efficiency measures leading to deep emissions reductions are capital intensive but lead to cost savings over the long run
3. Energy efficiency	↓ Decreases energy consumption	Energy efficiency measures will by definition reduce energy consumption
4. Resiliency	↑ Increase resilience	Efficiency measures which reduce GHG emissions will increase resilience by improving the passive survivability of homes
5. Public health and air quality	↓ Decreases health costs	Efficiency measures which reduce energy consumption improve health outcomes and decrease health costs
6. Household expenditures	↓ Decreases household energy costs	Energy efficiency measures will decrease household energy costs

7. Economic impact-employment	↑ Employment	Energy efficiency expenditures will stimulate employment
8. Social cost of carbon	↓ Decreases the social cost of carbon	Energy efficiency measures designed to reduce GHG emissions will reduce the social cost of carbon

Discussion

1. GHG Emissions

The provision of renewable energy is critical to decarbonising the energy system. Energy efficiency measures can reduce the capacity of renewable energy required both by reducing overall annual consumption, reducing peak demand and reducing demand when carbon intensive electricity is highest.

Energy efficiency measures can be compounding. For example, weatherization of a home can reduce the annual heating requirements by 50%. This reduces the size of heating equipment required, and if a heat pump is installed, which uses one unit of energy to generate three units of heat, the overall reduction in energy consumption is nearly 85%.

Energy efficiency measures which target deep GHG emissions are different from energy efficiency measures which target energy savings writ large. Measures can target savings to periods of more GHG intensive electricity generation. Other measures can avoid locking in investments in equipment or measures that result in incremental energy savings but do not result in substantial emissions reductions over the long run.

2. Economic Impact, Costs and Savings

GHG emissions reductions require a more systematic approach to energy efficiency that targets investments with a longer-term payback such as weatherization of the envelope over measures with a shorter term payback such as commercial lighting upgrades.[1] Incremental costs and savings can be reduced by retrofitting multiple buildings simultaneously; an approach known as the industrialisation of retrofits.

3. Energy Efficiency

Energy efficiency programs which will achieve GHG emissions reductions can be classified into four categories:

- More efficient equipment (i.e. heat pumps)
- Passive demand reduction (e.g., peak-saving efficiency)
- Demand flexibility programs (e.g., managed electric vehicle charging)
- Non-energy resources (e.g., refrigerant savings for GHG abatement, tree planting)

4. Resiliency

Some energy efficiency measures can increase the resilience of the home or building by increasing its passive survivability, its ability to maintain heating or cooling without external energy inputs. When the power is out as a result of a storm, the building or home will remain hot or cold for a period of time as a result of its enhanced thermal envelope, enabling people to shelter in place for longer periods. A study of buildings in New York City found that homes with efficiency upgrades

[1] For example see the analysis of the net present value of deep retrofits calculated for the Oregon Global Warming Commission presentation on October 7, 2022. Retrieved from: https://www.keeporegoncool.org/meeting-calendar/2022/10/7/oregon-global-warming-commission-meeting-virtual

could maintain indoor temperatures of over 60 degrees during a week-long power outage, whereas the temperature in average efficiency homes with no retrofit fell below 35°F in three days.[2]

5. Public Health and Air Quality

Households facing energy poverty or energy insecurity face challenges such as "pay the rent or feed the kids", "heat or eat", or "cool or eat". In particular, energy insecurity disempowers low-income residents such as single parents, the elderly, persons with disabilities, and others with low or fixed incomes, resulting in stresses such as utility-related debt, shutoffs, inefficient heating systems, antiquated appliances, and extreme home temperatures with significant health impacts.[3] Children may experience nutritional deficiencies, higher risks of burns from non-conventional heating sources, higher risks for cognitive and developmental behavior deficiencies, and increased incidences of carbon monoxide poisoning.[4] Subsequent impacts include parents being unable to work in order to look after children, missed school days, and lost productivity.

There are also health benefits to the extent that efficiency measures reduce combustion in the building envelope.

Maintaining or improving indoor air quality as a result of energy efficiency improvements requires careful design of ventilation and consideration of the materials used in the weatherization upgrades.

6. Household Expenditures

Energy efficiency measures decrease household expenditures on energy, and reduce the exposure of households and businesses to fluctuations in energy costs.

7. Economic Impact, Employment

Energy efficiency measures stimulate job creation.

8. Social Cost of Carbon

Energy efficiency measures that reduce greenhouse gas emissions will reduce the social cost of carbon.

---

[2] C2ES. (2018). Resilience Strategies for Power Outages.

[3] Hernández, D., & Bird, S. (2010). Energy burden and the need for integrated low-income housing and energy policy. Poverty & Public Policy, 2(4), 5–25. https://doi.org/10.2202/1944-2858.1095

[4] Ibid.