Green Rental Checklist Methodology

Overview

The Green Rental Checklist provides a point system with multiple compliance pathways. The three primary pathways are:

1. Planning – A set of points that represent a sustainable planning process resulting from determining which actions will be the most impactful and creating a plan for achieving them in the most sustainable manner.
2. GHG Modeled Points – A set of points based on modeled GHG reductions resulting from energy efficiency, electrification, and renewable energy.
3. Non-Modeled Points – A set of points with equal values that represent healthy, safe, and sustainable actions or improvements to rentals.

The checklist has 284 available points.

Planning

Energy assessments provide an understanding of how the unit is currently performing as well as identify cost effective options for decreasing energy costs, eliminating GHG emissions, and utilizing renewable energy. These reports will show landlords the best next steps to move towards compliance on the GHG Modeled Pathway. Additionally, creating an Energy Improvement Plan will help landlords take the results from an energy assessment or an alternative process and put into action the recommendations in a way that fits in with their existing business model to meet their goal. By completing these actions, it will help make changes that are the most impactful with a better understanding of energy usage and savings.

GHG Modeled Points Pathway

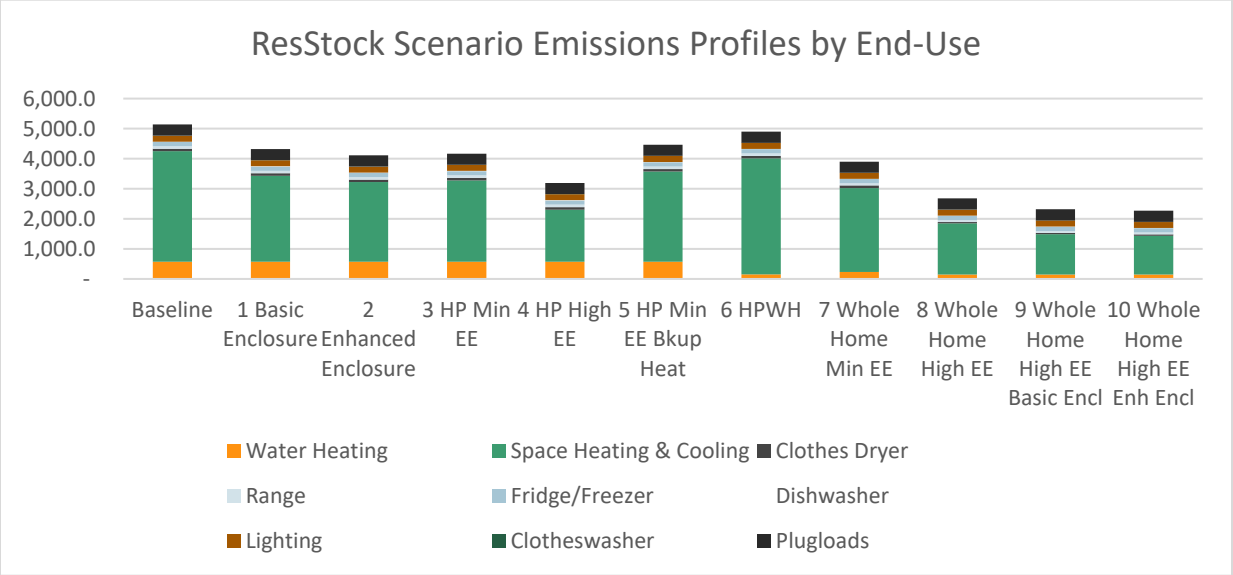
The GHG Modeled Points Pathway is built on data from the National Renewable Energy Laboratory's ResStock tool[1]. The basic methodology measures GHG reductions from average GHG emissions profile of a household in Michigan. The model starts with a representative set of energy consumption, by end-use and fuel type, per square foot for the State of Michigan[2]. Next, end-use savings shapes that measure the energy savings by end-use from specific energy upgrades were used to establish outcomes from specific actions[3]. End-uses with different fuel types were grouped together to form a baseline energy consumption per square foot model that could be compared to different scenarios. These include:

- Space Heating
- Water Heating
- Clothes Dryers
- Clothes Washers
- Cooking Ranges

[1] https://www.nrel.gov/buildings/resstock.html
[2] https://resstock.nrel.gov/dataviewer?datasetName=vizstock_resstock_amy2018_release_2022_1_by_state_view
[3] https://www.nrel.gov/buildings/assets/pdfs/euss-resround1-webinar.pdf

- Fridges and Freezers
- Dishwashers
- Lighting
- Plugloads

The baseline and all scenario outcomes were converted from energy use by fuel type to a GHG profile utilizing the emissions factors by fuel type from ResStock[4][5]. The GHG profiles of each scenario were evaluated, based on the specific parameters utilized in the end-use savings shape analysis, to set the benchmarks for system changes (e.g., installing a high-efficiency heat pump) and the resulting changes in GHG emissions. The chart below shows the changes in emissions profiles across each scenario.



There were end-uses that did not have any changes in their energy consumption from these scenarios. In these cases, other methods were utilized to evaluate potential savings. Dishwashers, Refrigerators, and Lighting utilized the detailed ResStock data for Michigan to show differences in energy consumption from the baseline data (e.g., having 100% LED lightbulbs, and Energy Star Dishwasher, or an EF 19.9 refrigerator). Plugloads were also modeled using a study from Pacific Northwest National Lab and Lawrence Berkeley National Laboratory[6]. We ultimately decided to not include plugloads in the modeled pathway because landlords have no control over how much their tenants utilize plugged in devices that are not provided by the landlord (e.g., televisions, computers, phone chargers, etc.).

The results of these analyses were then translated into point system that was based on the baseline emissions profile representing 100% of possible GHG emissions that could be reduced through actions that affect specific end-uses.

Energy efficiency actions represented 75% of total emissions reduction potential. The remaining 25% can only be reduced by utilizing renewable energy for the remaining electricity. A household can only reduce that remaining 25% of emissions through renewable energy if they have an all-electric

[4] https://www.nrel.gov/analysis/cambium.html
[5] https://www.resnet.us/about/resnet-carbon-rating-index/
[6] https://zenodo.org/record/4012692

household. The end result of having a highly efficient, all-electric household that utilizes renewable energy would be 100 points.

Non-Modeled Points Pathway

To enable a comparable pathway for compliance that is not directly tied to the modeled points for emissions reductions, a set of health, safety, and sustainability actions were established to balance the checklist. Points are awarded in equal amounts, with few exceptions, across two primary categories: Sustainability, Health, and Education and Water Conservation. It is important to note that some checklist questions award both modeled and non-modeled points because the actions have multiple impacts that provided increased value.

Sustainability, Health, and Education

Questions in this section are focused on actions or education that result in a direct health impact, a sustainability impact that likely reduces GHG emissions but is not easily quantifiable, or a combination of the two. Each question can award 2 points in either area, so some questions can result in either 2 or 4 points. The exception is for having renters attend a Renter Sustainability Session provided by the City, which we expect to have an outsized impact on renter behavior and personal energy consumption from plugload use that is not included in the modeled pathway.

Water

Water conservation has numerous sustainability benefits that extend from household energy and water bill savings to system-wide savings to our energy infrastructure and wastewater management.

Electrification and Renewable Energy

There are crossover points for having electric systems in households and utilizing renewable energy. Removing combustion appliances like cooking ranges, dryers, water heaters, and furnaces removes harmful indoor air pollutants that can contribute to cardio-respiratory diseases and long-term health impacts. 2 points are awarded for each system that is electrified. Utilizing renewable energy has inherent GHG emissions impacts, but it also removes harmful outdoor air pollutants and contaminants that can get into soils and groundwater, resulting from the combustion of fossil fuels at power plants. 2 points are awarded for utilizing renewable energy for the majority of a household's electricity consumption. These points are not dependent on the household having made any energy efficiency improvements from the Modeled Pathway.

Insulation and Air Sealing

Improving the building shell of a household has very clear energy efficiency benefits, but it also has broader health and safety and sustainability benefits. Households that reduce air infiltration can reduce harmful outdoor air pollutants that come indoors. Households also maintain more consistent temperatures which contributes to lower likelihoods of illness[7]. Properly insulated and air sealed homes better manage moisture which reduces the likelihood of mold and mildew for better health outcomes. 2 Points were awarded for each insulation and air sealing question for health and safety, resulting in 10 additional points. There are also 10 points possible for sustainability, as having a properly insulated and air sealed building shell helps make sure other building systems are right-sized – likely smaller capacity –

[7] https://www.science.org/doi/10.1126/sciadv.abg0947

and has a significant impact on reducing peak heating and cooling loads on the grid that align with more carbon intensive energy sources being utilized to meet demand.