# What is a scenario?

## A scenario is a what if? question

What if we limited allowable total carbon of buildings?

What if we decarbonized institutional/public buildings?

What if we enacted residential or expanded commercial PACE financing?

# We need details for each policy

**Which buildings-** new, existing or both

**Which sector-** residential, commercial, industrial

**By when-** 2030, 2035, 2040?

**How much-** 20%, 50%, 75%

And is it about **energy or emissions?**

# Survey results: Policy details to be modelled

**SSG will model or analyze the following policy directions to gather more information:**

1. Building performance standards
2. Promote, incentivize, and/or subsidize energy efficiency and heating/cooling efficiency increases
3. Decarbonize institutional/public buildings
4. Promote, incentivize, and/or subsidize heat pumps
5. Assess and disclose material-related emissions

6,7. Enact energy-efficient building codes

**Several selected policies will be analyzed differently:**

- Modify Energy Trust of Oregon's (ETO) metrics and operations
- Align energy efficiency programs with State's climate goals
- Promote, incentivize, and/or subsidize air purification systems

*Source: LPRO*

# Survey results: Policy details to be modelled

**24 respondents** of 27 Task Force members

**SSG couldn't model every scenario:**

- Utilized a survey to provide some bounds
- Asked Task Force to provide preferences on the policy details that need to be entered into the model
- Default policies were informed by Task Force discussions

**A couple of things to note:**

- Respondents were not required to answer questions
- A respondent initially answering that they preferred the default did not get all questions about specific preferences
- Respondents who did not select certain answers did not see subsequent relevant questions

*Source: LPRO*

# Building performance standards

**Preference – 20** | **Use default – 4**

| **Goal** | | |
|---|---|---|
| Less stringent than default- 5% reduction<br>7 | Default -Require direct emissions to be reduced by 20% of 2025 emissions by 2030<br>5* | More stringent than default – 40% reduction<br>12 |

| **Building Type** | | | |
|---|---|---|---|
| | **Existing** | **New** | **Do not include this type** |
| Residential | 14 | 9 | 1 |
| Multifamily | 14 | 8 | 1 |
| Institutional/Public | 18 | 9 | 0 |
| Industrial | 12 | 3 | 7 |
| Commercial | 13 | 8 | 1 |

| **Commercial minimum square footage** | | |
|---|---|---|
| Higher than default<br>6 | Default - 35,000 sq ft<br>7* | Lower than default<br>10 |

*Source: LPRO*

**default values include "Use default" from initial question*

# 1. Building performance standards

| *Policy concept* | *Building performance standards* | | | |
|---|---|---|---|---|
| *Scenario* | *1a* | *1b* | *1c* | *1d* |
| Target | Direct emissions need to reach 5% below 2025 levels by 2030 | | Direct emissions reduced by 40% of 2025 by 2030 | |
| Building types | Existing residential, commercial, industrial and multi-family buildings | | | |
| Building sizes | All buildings | Buildings ≥ 35,000 ft2 | All buildings | Buildings ≥ 35,000 ft2 |

# Promote, incentivize, and/or subsidize energy efficiency and heating/cooling efficiency increases

| Preference – 20 | Use default – 4 |
|---|---|

| Goal | | |
|---|---|---|
| Less stringent than default – 50% of buildings are retrofitted<br><br>8 | Default -Require direct emissions to be reduced by 20% of 2025 emissions by 2030<br>5* | More stringent than default – 100% of buildings are retrofitted<br><br>10 |

| Building Type | |
|---|---|
| Residential | 18 |
| Single family | 18 |
| Row houses | 17 |
| Apartments | 18 |
| Commercial | 20 |

| Commercial minimum square footage | | | |
|---|---|---|---|
| Higher than default<br>2 | Default - 50,000 sq ft<br>6* | Lower than default<br>10 | No minimum sq ft<br>6 |

*Source: LPRO*

**default values include "Use default" from initial question*

# 2. Promote, incentivize and or subsidize energy efficiency and heating/cooling

| *Policy concept* | *Promote, incentivize and or subsidize energy efficiency and heating/cooling* | | | |
|---|---|---|---|---|
| *Scenario* | *2a* | *2b* | *2c* | *2d* |
| Target | 100% of buildings are retrofitted by 2035, thermal energy requirements reduced by 50% | | 50% of buildings are retrofitted by 2050, thermal energy requirements reduced by 15% | |
| Building types | All building types | | | |
| Building sizes | Buildings ≥ 50,000 ft2 | Buildings ≥ 30,000 ft2 | Buildings ≥ 50,000 ft2 | Buildings ≥ 30,000 ft2 |

# Decarbonize institutional/public buildings

**Preference – 20** | **Use default – 4**

| Goal | | |
|---|---|---|
| Less stringent than default – | Default – | More stringent than default – |
| • New buildings after 2035 are carbon neutral,<br>• 50% of buildings are retrofitted by 2045,<br>• thermal energy requirements reduced by 15%, and<br>• plug load reduced by 15% | • New buildings after 2030 are carbon neutral,<br>• 80% of buildings are retrofitted by 2040,<br>• thermal energy requirements reduced by 30%, and<br>• plug load reduced by 30% | • New buildings after 2023 are carbon neutral,<br>• 100% of buildings are retrofitted by 2035,<br>• thermal energy requirements reduced by 50%, and<br>• plug load reduced by 50% |
| 9 | 5* | 10 |

*Source: LPRO*

**default values include "Use default" from initial question*

# 3. Decarbonize institutional/public buildings

| *Policy concept* | *Decarbonize institutional/public buildings* | |
|---|---|---|
| *Scenario* | *3a* | *3b* |
| Target- part 1 | New buildings after 2035 are carbon neutral | New buildings after 2023 are carbon neutral |
| Target- part 2 | 50% of buildings are retrofitted by 2045; thermal energy requirements reduced by 15%; plug load reduced by 15% | 100% of buildings are retrofitted by 2035: thermal energy requirements reduced by 50%; plug load reduced by 50% |

# Promote, incentivize, and/or subsidize heat pumps

**Preference – 20** | **Use default – 4**

| Goal | | |
|---|---|---|
| Less stringent than default- 50% of buildings that are covered have a heat pump installed by 2050<br>5 | Default - 80% of by 2040<br>6* | More stringent than default – 100% of buildings by 2035<br>13 |

| Building Type | | | |
|---|---|---|---|
| **Existing residential** | | **New residential** | |
| Single family | 17 | Single family | 17 |
| Row houses | 16 | Row houses | 16 |
| Apartments | 17 | Apartments | 18 |

| Commercial size | | | | | |
|---|---|---|---|---|---|
| Type | Higher than default | Default- 50,000 sq ft | Lower than default | All - no minimum | Do not apply |
| New Commercial | 0 | 8* | 0 | 14 | 0 |
| Existing Commercial | 1 | 7* | 0 | 14 | 0 |

**default values include "Use default" from initial question*

*Source: LPRO*

# Promote, incentivize, and/or subsidize heat pumps, cont…

| Option modelled to promote installation of heat pumps in homes regardless of their existing energy source | |
|---|---|
| Yes<br>21 | No<br>3 |

*Source: LPRO*

**default values include "Use default" from initial question*

# 4. Promote, incentivize, and/or subsidize heat pumps

| *Policy concept* | *Promote, incentivize, and/or subsidize heat pumps* | |
|---|---|---|
| *Scenario* | *4a* | *4b* |
| Target | 80% of covered buildings have a heat pump installed by 2040 | 100% of buildings that are covered have a heat pump installed by 2035 |
| Building types | New and existing residential and commercial buildings | |

# Assess and disclose material-related emissions

| Preference – 20 | Use default – 4 |
|---|---|

| Goal | | |
|---|---|---|
| Less stringent than default- 20% reduction by 2030<br>9 | Default - Reducing embodied carbon from construction by 40% by 2030, compared to 20185*<br>4* | More stringent than default – 60% reduction by 2030<br>10 |

| Residential Building Type | |
|---|---|
| Single family | 16 |
| Row houses | 15 |
| Apartments | 16 |

| Commercial minimum square footage | | | |
|---|---|---|---|
| Higher than default<br>6 | Default - 35,000 sq ft<br>7* | Lower than default<br>10 | No minimum sq ft<br>1 |

*Source: LPRO*

**default values include "Use default" from initial question*

# 5. Assess and disclose material-related emissions

| *Policy concept* | *Assess and disclose material-related emissions* | | | |
|---|---|---|---|---|
| *Scenario* | *5a* | *5b* | *5c* | *5d* |
| Target | Reduce embodied carbon from construction by 20% by 2030, compared to 2018 | | Reduce embodied carbon from construction by 60% by 2030, compared to 2018 | |
| Building types | Residential, Commercial | | | |
| Building sizes | Buildings ≥ 50,000 ft2 | Buildings ≥ 30,000 ft2 | Buildings ≥ 50,000 ft2 | Buildings ≥ 30,000 ft2 |

# Enact energy-efficient codes - Existing

**Preference – 20** | **Use default – 4**

| Goal | | |
|---|---|---|
| Less stringent than default-<br>• 50% of existing buildings are retrofitted by 2050,<br>• thermal energy requirements reduced by 15%, and<br>• plug load reduced by 15%<br>9 | Default –<br>• 80% existing buildings are retrofitted by 2040<br>• thermal energy requirements reduced by 30% and<br>• plug load reduced by 30%<br>5* | More stringent than default –<br>• 100% of existing buildings are retrofitted by 2035,<br>• thermal energy requirements reduced by 50%, and<br>• plug load reduced by 50%<br>10 |

| Residential Building Type | |
|---|---|
| Single family | 18 |
| Row houses | 17 |
| Apartments | 18 |

| Commercial minimum square footage | | | |
|---|---|---|---|
| Higher than default<br>5 | Default - 35,000 sq ft<br>6* | Lower than default<br>12 | No minimum sq ft<br>1 |

*Source: LPRO*

**default values include "Use default" from initial question*

# 6. Enact energy-efficient building codes- Existing

| *Policy concept* | *Enact energy-efficient building codes- Existing* | | | |
|---|---|---|---|---|
| *Scenario* | *6a* | *6b* | *6c* | *6d* |
| Target | 50% of existing buildings are retrofitted by 2050, thermal energy requirements reduced by 15%, plug load reduced by 15% | | 100% of existing buildings are retrofitted by 2035, thermal energy requirements reduced by 50%, plug load reduced by 50% | |
| Building types | Residential, Commercial | | | |
| Building sizes | Buildings ≥ 50,000 ft2 | Buildings ≥ 30,000 ft2 | Buildings ≥ 50,000 ft2 | Buildings ≥ 30,000 ft2 |

# Enact energy-efficient codes - New

| Preference – 20 | Use default – 4 |
|---|---|

| Goal | | |
|---|---|---|
| Less stringent than default- 40% reduction in new building energy consumption from the 2006 Oregon codes<br>9 | Default – 60% reduction in new building energy consumption from the 2006 Oregon codes<br>5* | More stringent than default – 80% reduction in new building energy consumption from the 2006 Oregon codes<br>11 |

| Residential Building Type | |
|---|---|
| Single family | 18 |
| Row houses | 17 |
| Apartments | 19 |

| Commercial minimum square footage | | | |
|---|---|---|---|
| Higher than default<br>6 | Default - 35,000 sq ft<br>6* | Lower than default<br>4 | No minimum sq ft<br>8 |

*Source: LPRO*

**default values include "Use default" from initial question*

# 7. Enact energy-efficient building codes- New

| *Policy concept* | *Enact energy-efficient building codes- New* | | | |
|---|---|---|---|---|
| *Scenario* | *7a* | *7b* | *7c* | *7d* |
| Target | A 40% reduction in new building energy consumption from the 2006 Oregon codes | | A 80% reduction in new building energy consumption from the 2006 Oregon codes | |
| Building types | Residential, Commercial | | | |
| Building sizes | Buildings ≥ 50,000 ft2 | All buildings | Buildings ≥ 50,000 ft2 | All buildings |

| Policy Direction | Default Policy or Values |
|---|---|
| Building performance standards | Climate Solutions Now Act of 2022 [Maryland, SB 0528, 2022]:<br>• Requires energy efficiency and emissions reductions for certain buildings.<br>• Sets BPSs for buildings over 35,000 square feet.<br>• Reporting of direct emissions from heat begins in 2025.<br>• Covered buildings are required to reduce direct emissions 20% below 2025 by 2030 and achieve net-zero direct emissions by 2040. |
| Promote, incentivize, and/or subsidize energy efficiency and heating/cooling efficiency increases | • Incentivizes energy efficiency and emissions reductions for existing buildings<br>• 80% of buildings are retrofitted by 2040<br>• Thermal energy requirements reduced by 30% |
| Decarbonize institutional/public buildings | Seattle Energy Code:<br>• New buildings after 2030 are carbon neutral<br>• 80% of buildings are retrofitted by 2040<br>• Thermal energy requirements reduced by 30%<br>• Plug load* reduced by 30%<br>• *plug load is energy used by equipment that is plugged into outlets |

*Source: LPRO*

| Policy Direction | Default Policy or Values |
| --- | --- |
| Promote, incentivize, and/or subsidize heat pumps | • Requires heat pumps installed in certain buildings<br>• 80% of covered buildings have a heat pump installed by 2040 |
| Assess and disclose material-related emissions | City of Vancouver's Embodied Carbon Strategy:<br>• Set a goal of reducing embodied carbon from construction by 40% by 2030, compared to 2018 |
| Enact energy-efficient building codes (existing) | Seattle Energy Code:<br>• Requires energy efficiency and emissions reductions for existing buildings<br>• 80% buildings are retrofitted by 2040<br>• Thermal energy requirements reduced by 30%<br>• Plug load reduced by 30% |
| Enact energy-efficient building codes (new) | E.O. 20-04:<br>Requires a 60% reduction in new building consumption of energy from the 2006 Oregon residential and commercial codes |

*Source: LPRO*