

Our role

Evaluating Policies

Presentations

1

Modelling
Approach

2

Baseline and
BAU

3

Scenario
Results

4

Financial
Impacts &
Additional
Benefits

5

Draft Report

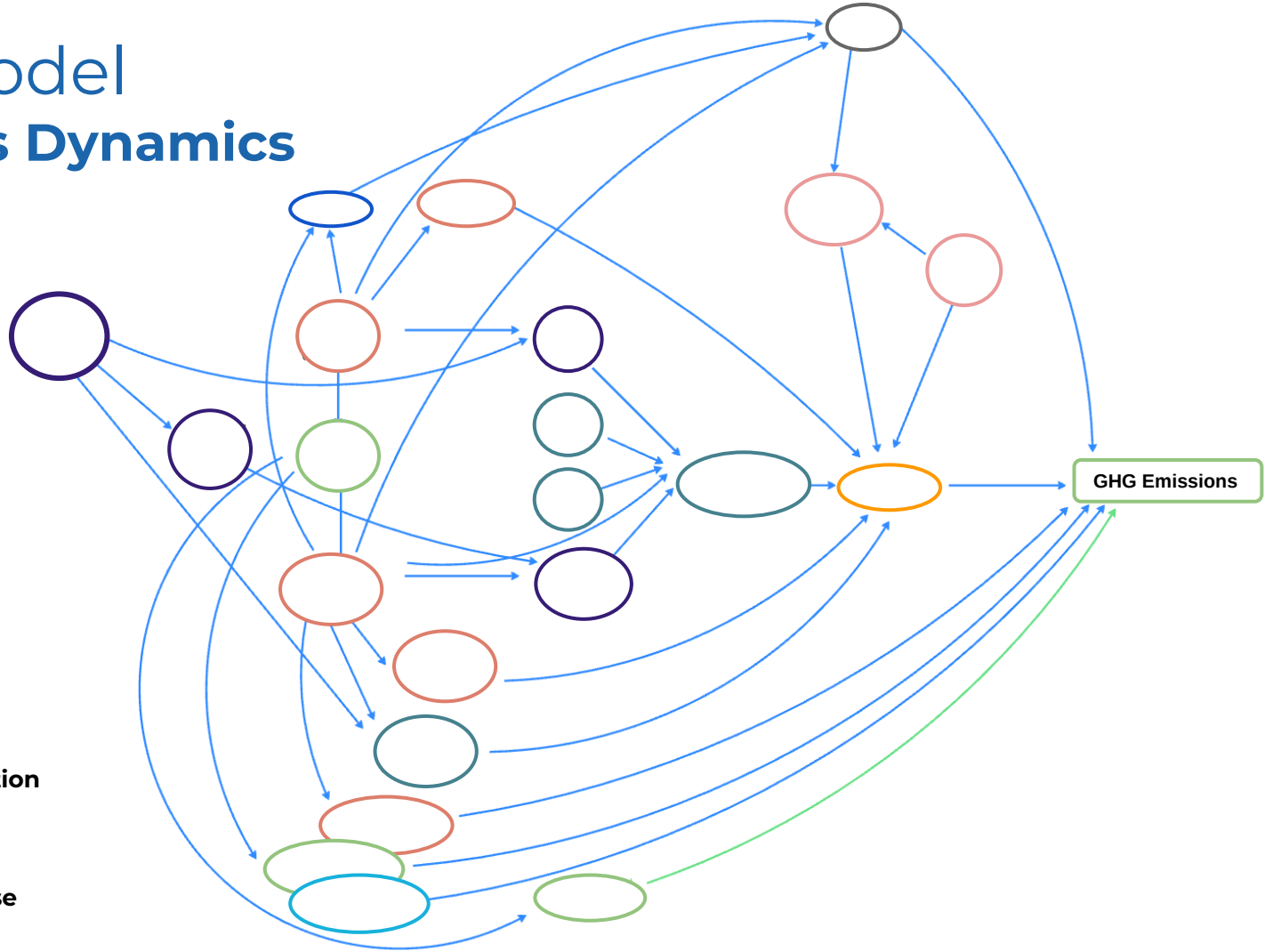
Key Inputs	Key Outputs
List of policies	Scenario results (GHG and energy)
Setting policy parameters	Data, methods and assumptions manual
Decarbonization Scenarios (combination of policies)	Financial impacts
Financial cost catalogue	Health impacts
	Employment impacts
	Social cost of carbon
	Draft report and final report

How do we do it?

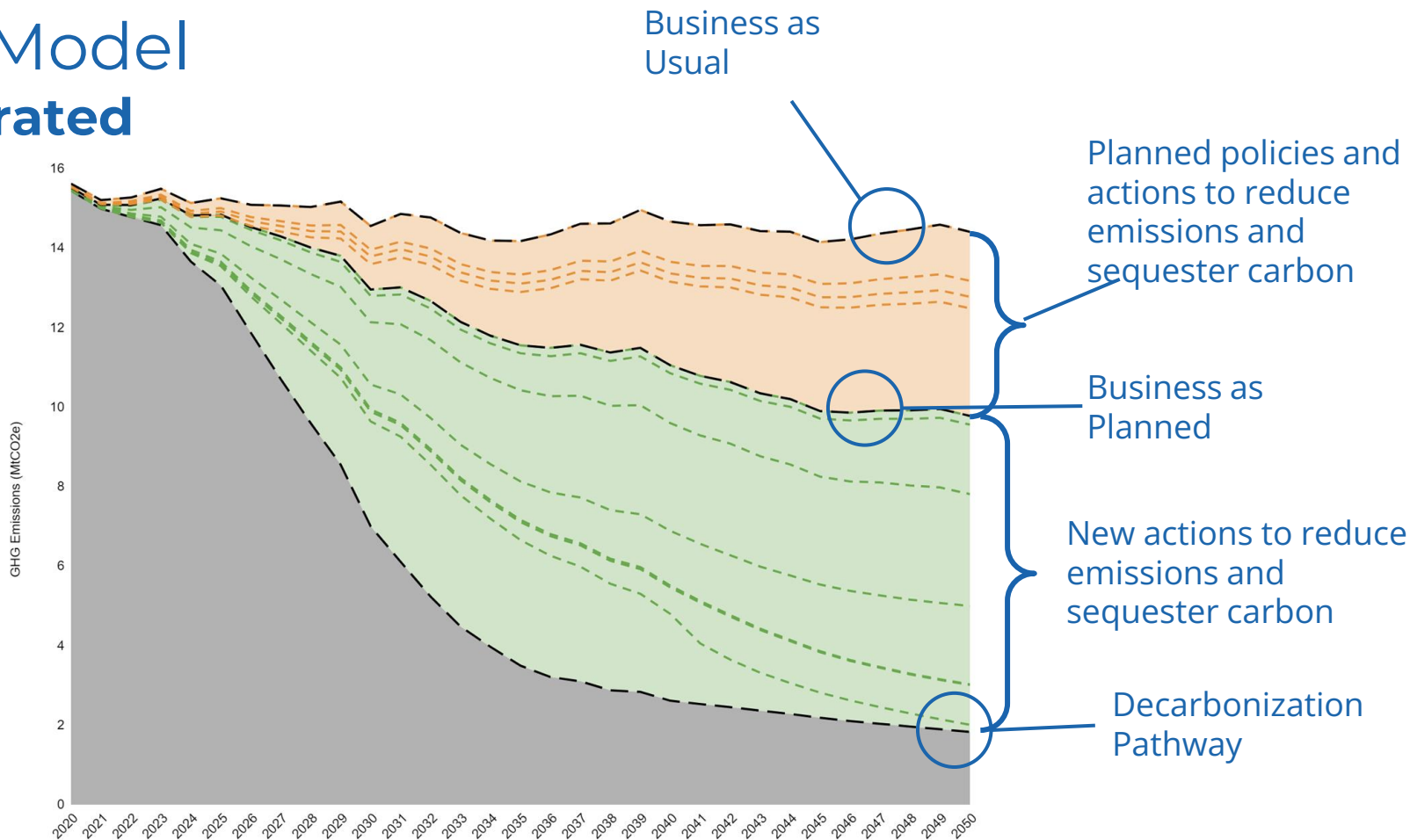
Modeling Process

The Model

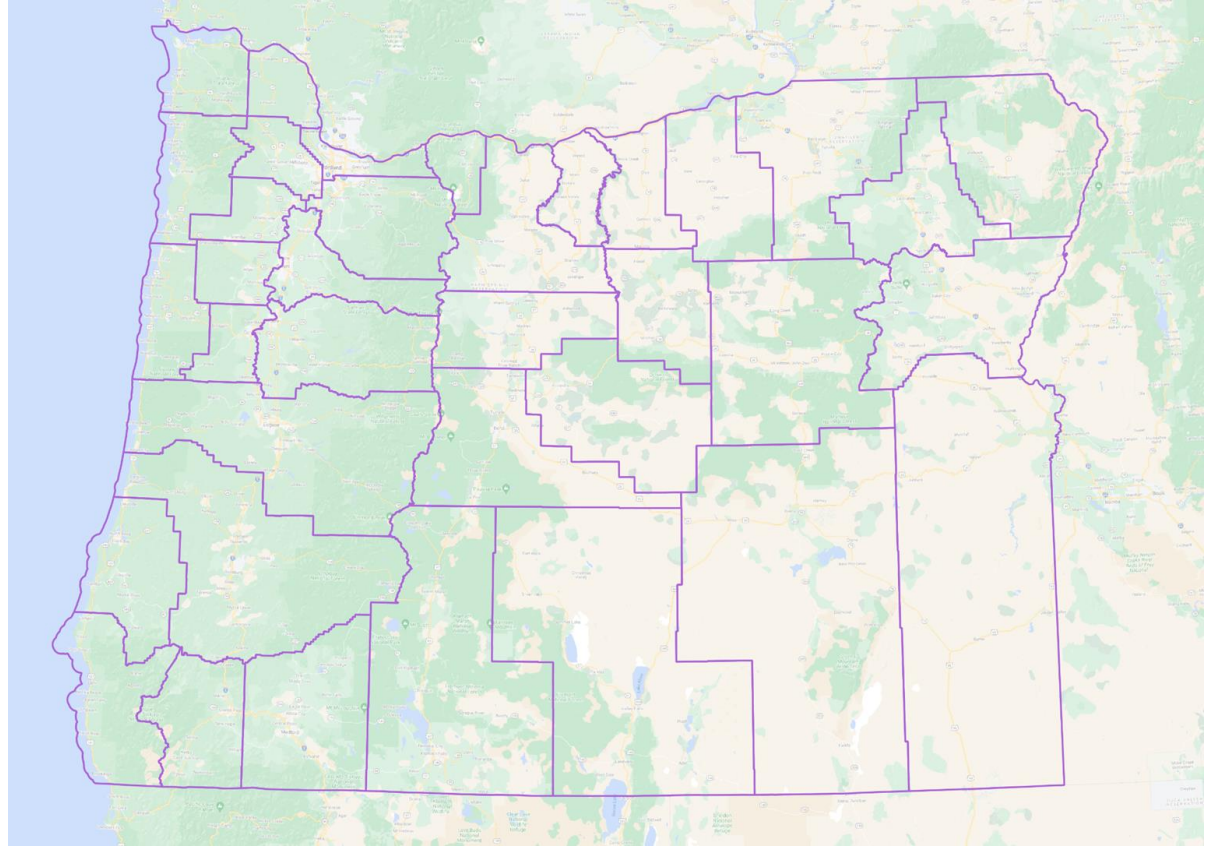
Systems Dynamics



The Model Integrated

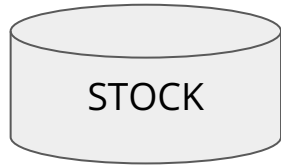


The Model Space



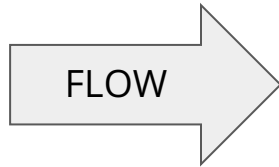
The Model

Stocks and Flows

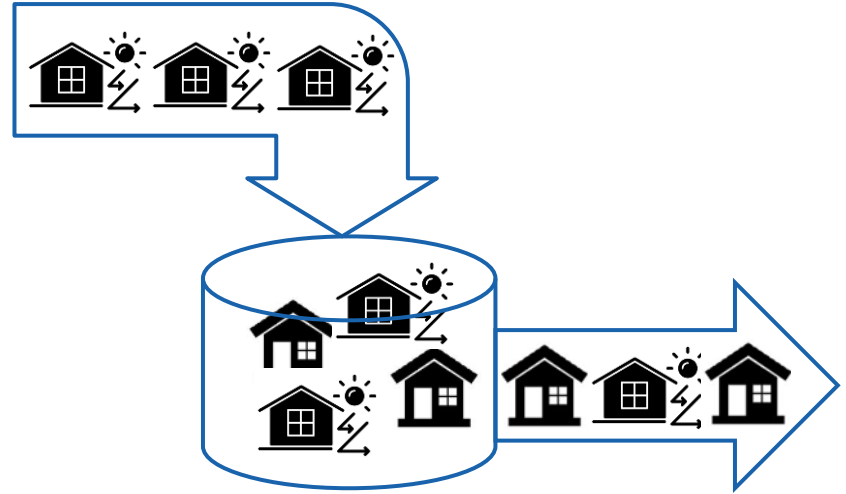


Measure of a collection of objects at a specific time

Provides balance but also lag in the system

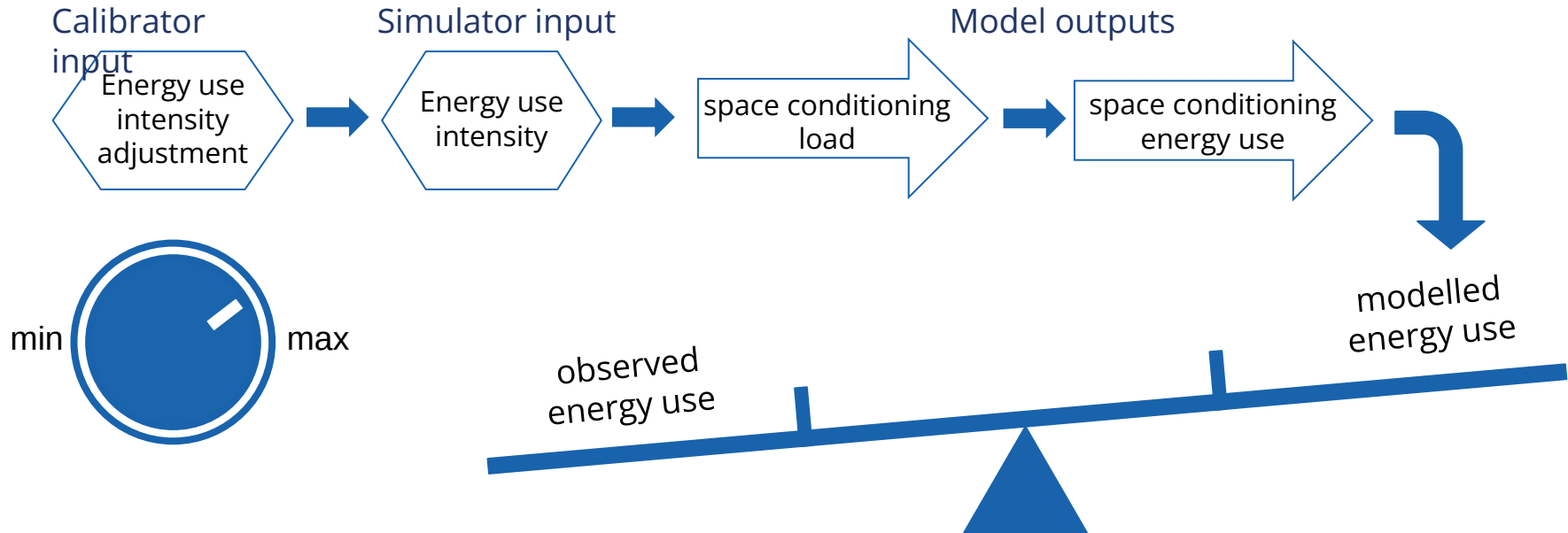


Measures the change of a stock over a period of time



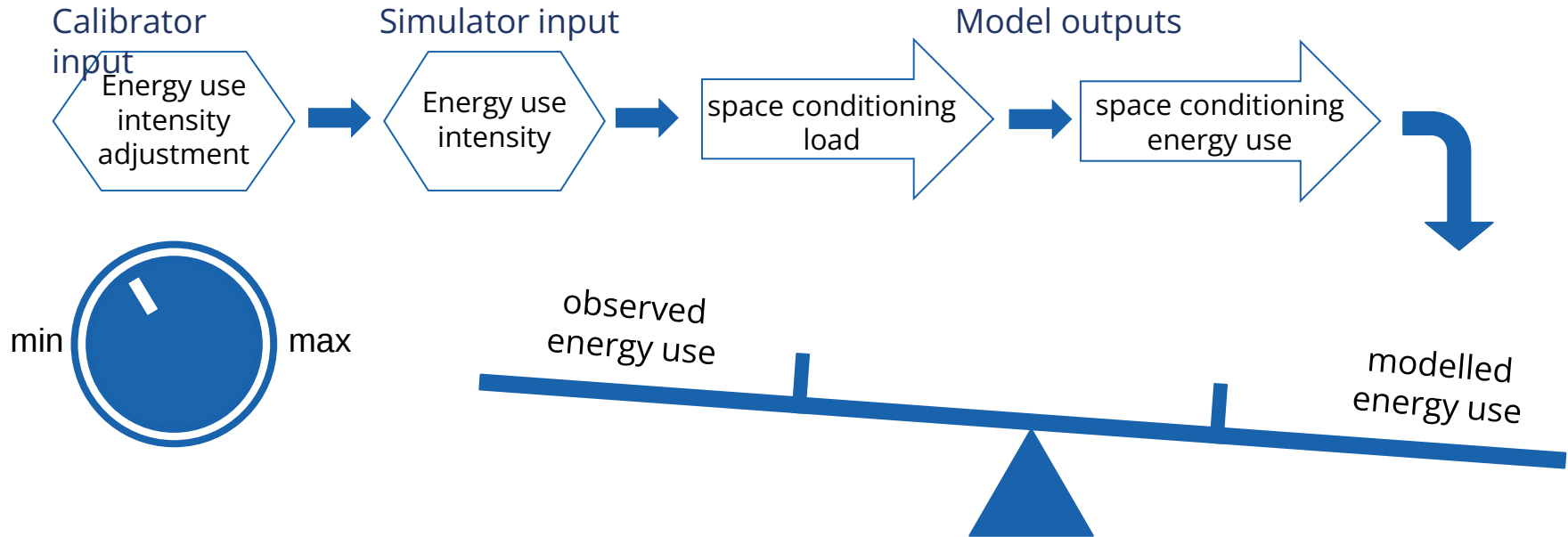
Calibration

Adjust calibrator input parameters to ensure that model outputs align with observed data



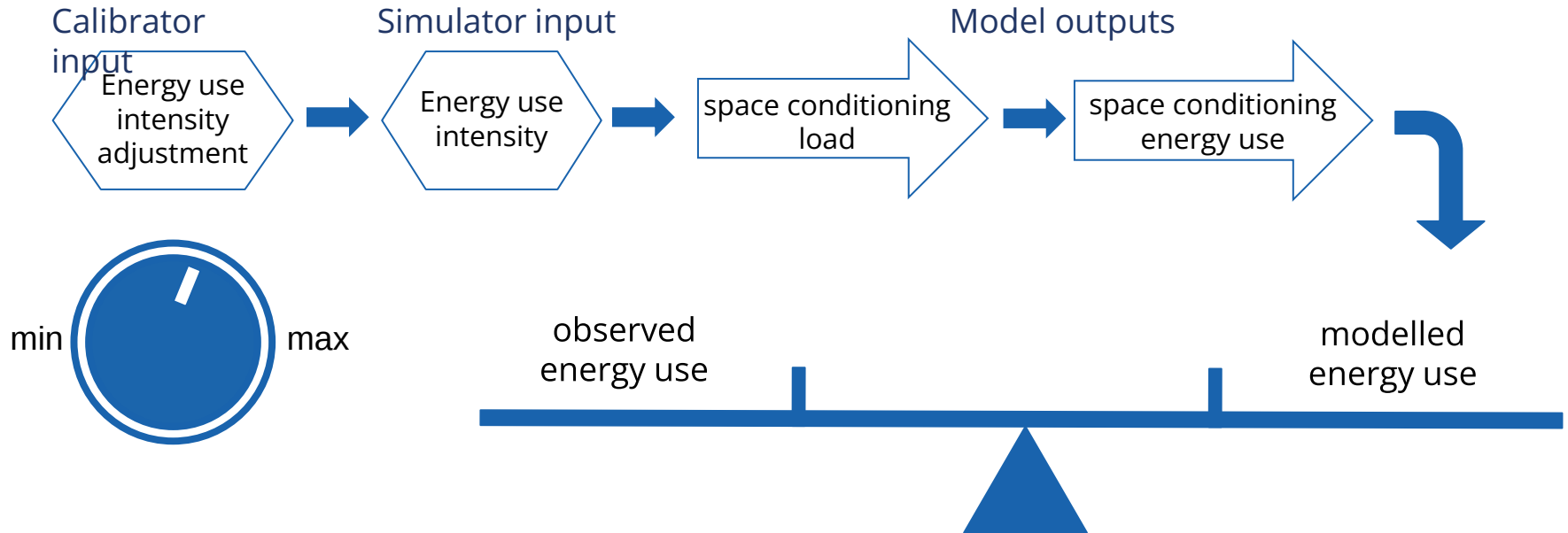
Calibration

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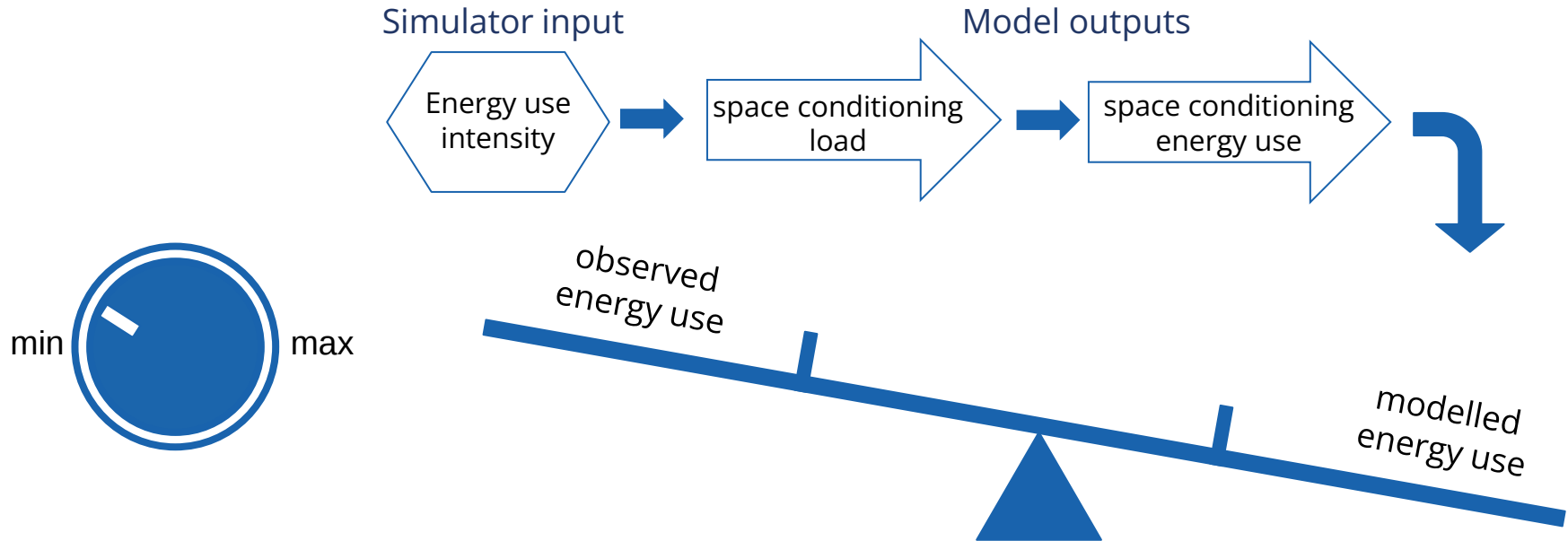
Calibration

Adjust calibrator input parameters to ensure that model outputs align with observed data



Simulation

Adjust simulator input parameters to simulate the new action based on new parameters



Calibration

Data Sources - Demand

Data Type	Source
Population by county, age, sex	US Census - 2019 ACS
Residential buildings by county and type	US Census - 2019 ACS
Residential floor space by county and type	Replica land use data
Non-residential floor space by county and type	Replica land use data NEEA CBSA
Natural gas deliveries by county	Utility data
Electricity sales by utility and customer sector	EIA Form 861
Other fuel use	SEDS
Equipment shares	NEEA RBSA and CBSA

Modelling Policies

1

Identification

2

Defining
policies

3

Setting
parameters

4

Combine into
scenarios

5

Evaluate the
scenarios

Policies

Setting Parameters

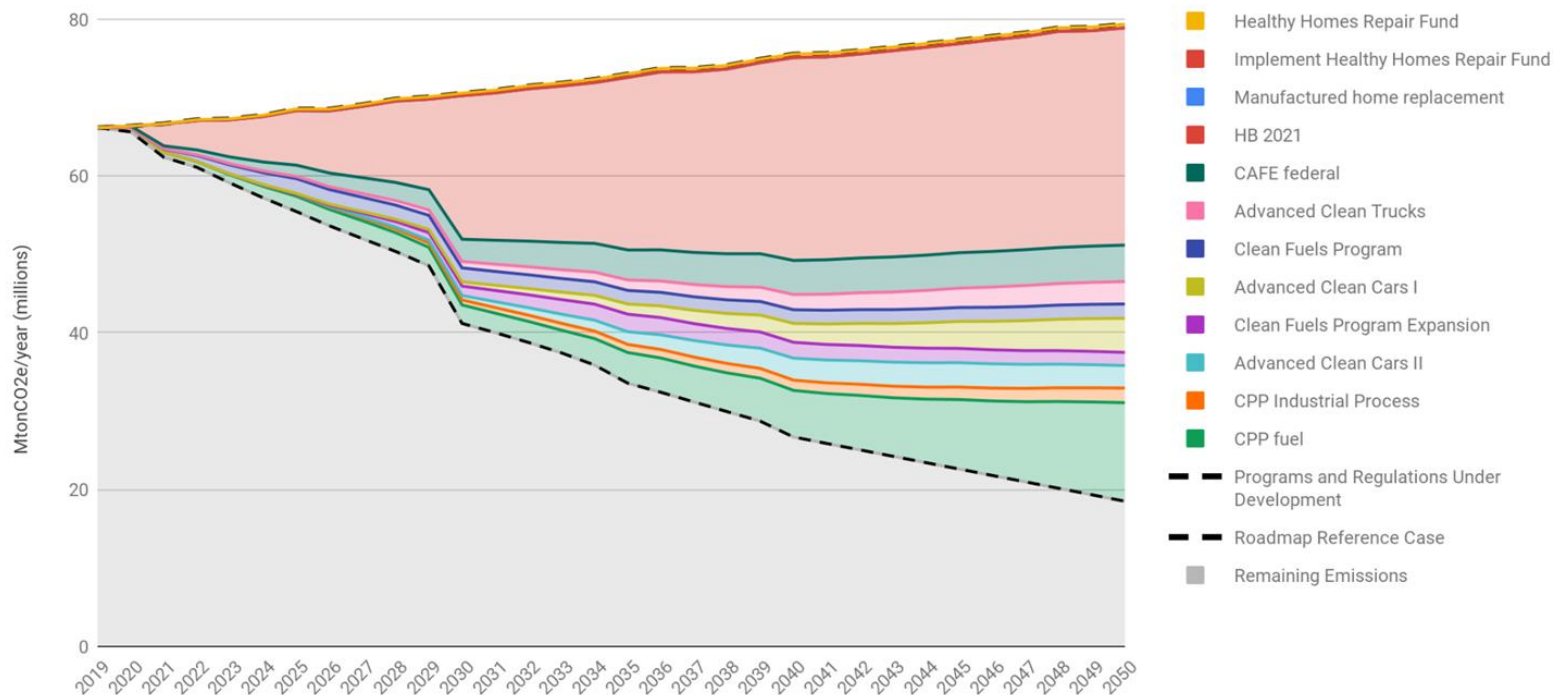
Limit Allowable Total Carbon of Buildings

GHGI reduction of X% by 2025, x% by 2035 and x% by 2050

Scenario 1	Scenario 2
EUI reduction of X% by 2025, x% by 2035 and x% by 2050 over some past year	EUI reduction of Y% by 2025, Y% by 2035 and Y% by 2050 over some past year
<u>80%</u> electric air source, <u>20%</u> electric ground source by <u>2040</u>	<u>50%</u> electric air source, <u>50%</u> natural gas (RNG) air source by <u>2040</u>

Results

Lifecycle GHG Emissions



Results

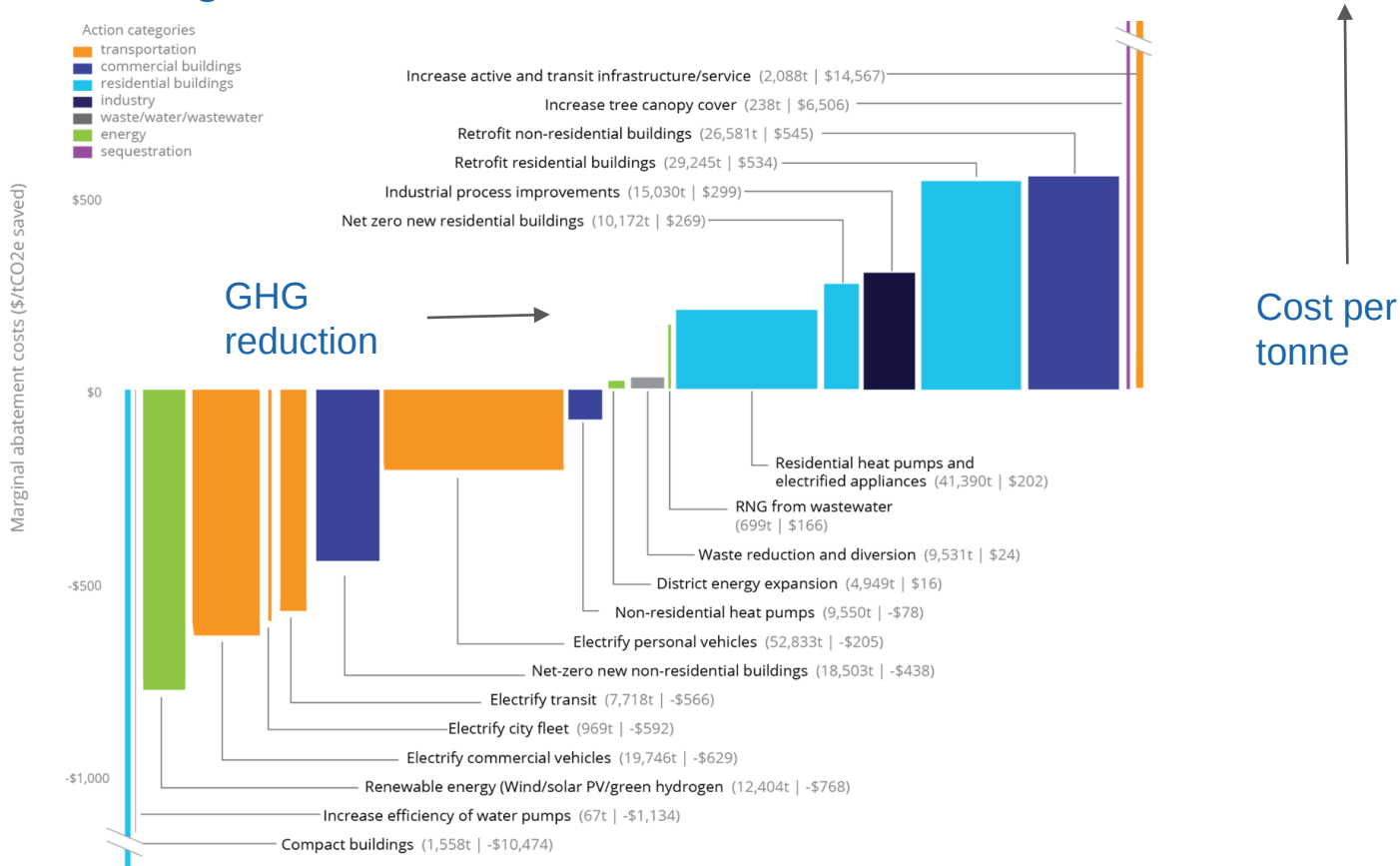
Financial Analysis

- Incremental costs and savings over the course of the investment by sector (residential, commercial and industrial)
- Financial cost catalogue ensures all the financial assumptions are transparent
- Sensitivity analysis is used to evaluate future uncertainty in costs

Results

Financial Analysis

Savings
per tonne



Results

Additional Benefits

- Increasing energy efficiency
- Improving public health and air quality
- Energy Burden
- Improving resilience against climate change
- Climate and health costs, savings and benefits
- Lifecycle emissions
- Social cost of carbon

