scout

U.S. DEPARTMENT OF ENERGY

How to use BTO Scout to communicate the broader impacts of your work

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BTO Awardee Kickoff Meeting, December 12th, 2017

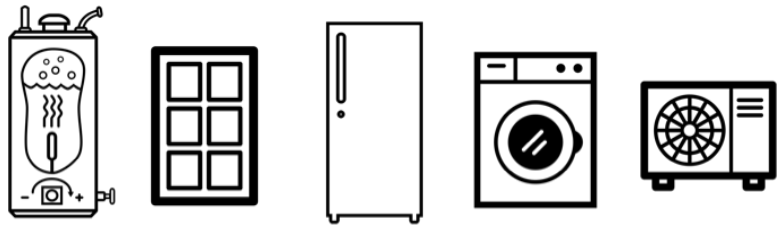
Scout places emerging building technologies into a broader energy efficiency policy context

Scout helps answer the following questions:

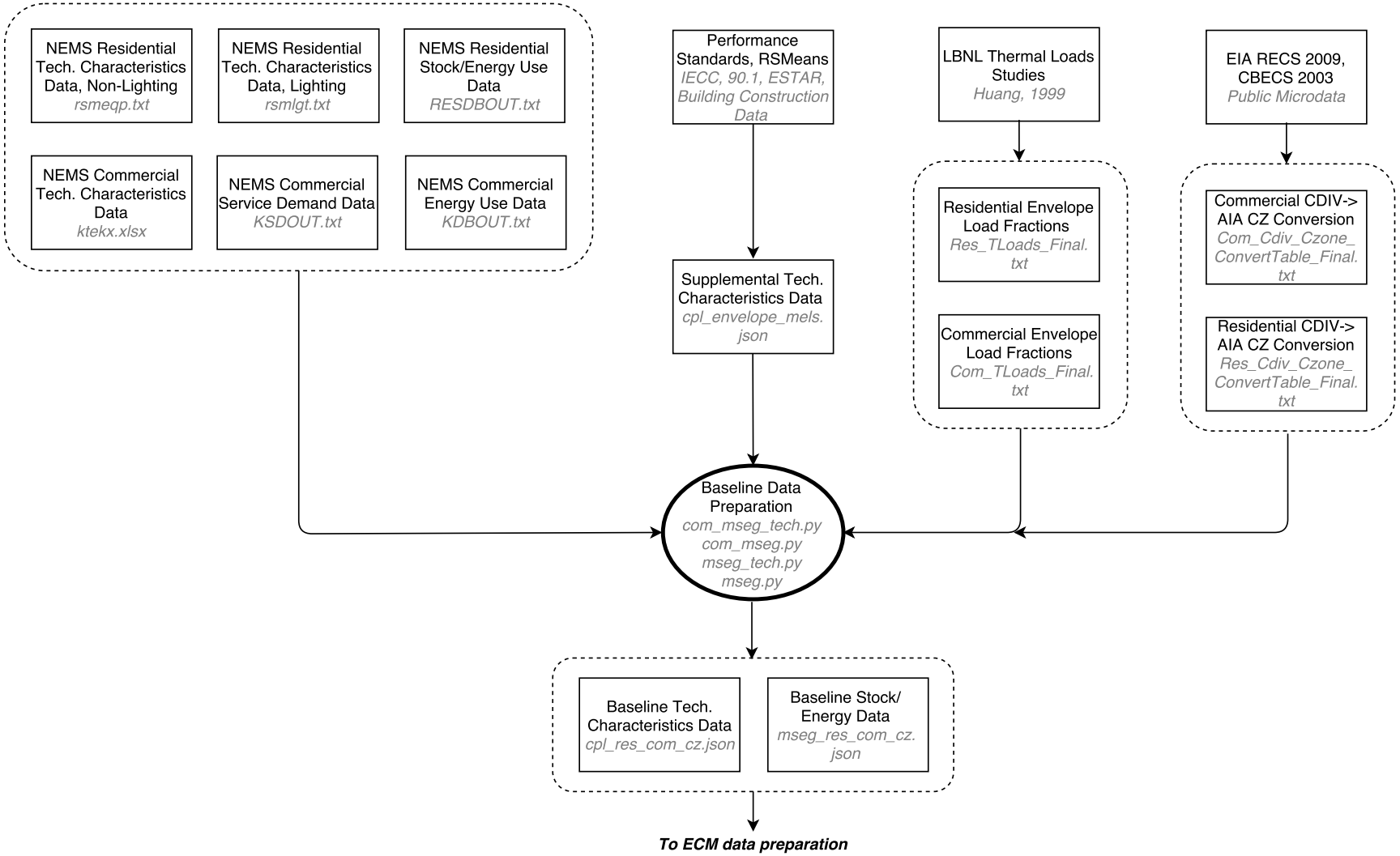
1. What are the biggest opportunities for U.S. building energy use and cost reductions – now, in 10 years, in 20 years?

2. How might a efficiency measure (or measures) impact "business-as-usual" building energy use in the U.S.?

3. Does a measure (or measures) compare favorably to and/or complement other efficiency measures?



The starting point for Scout is baseline energy use data aggregation across multiple sources



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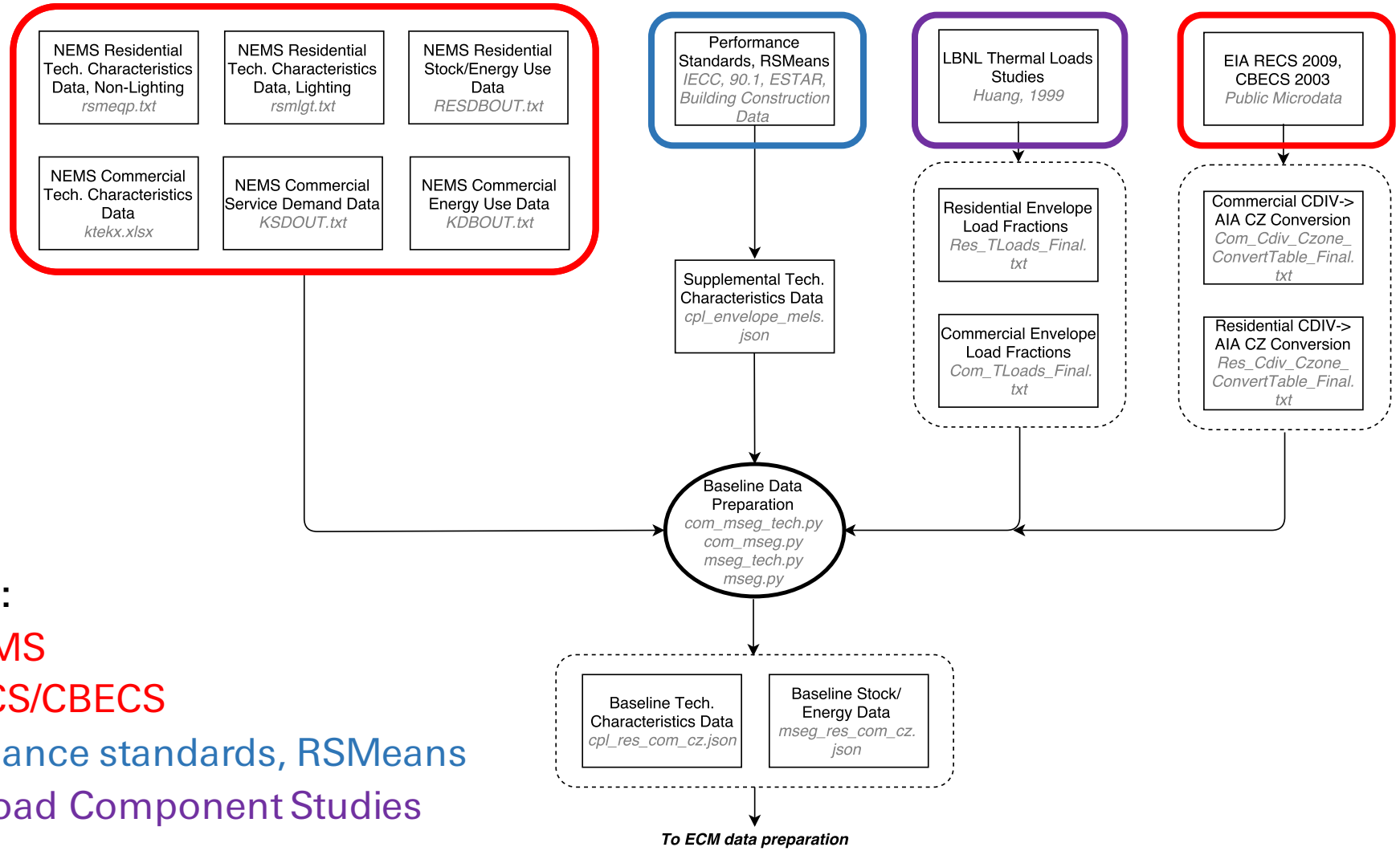

Input data:

- EIA NEMS
- EIA RECS/CBECS
- Performance standards, RSMeans
- LBNL Load Component Studies

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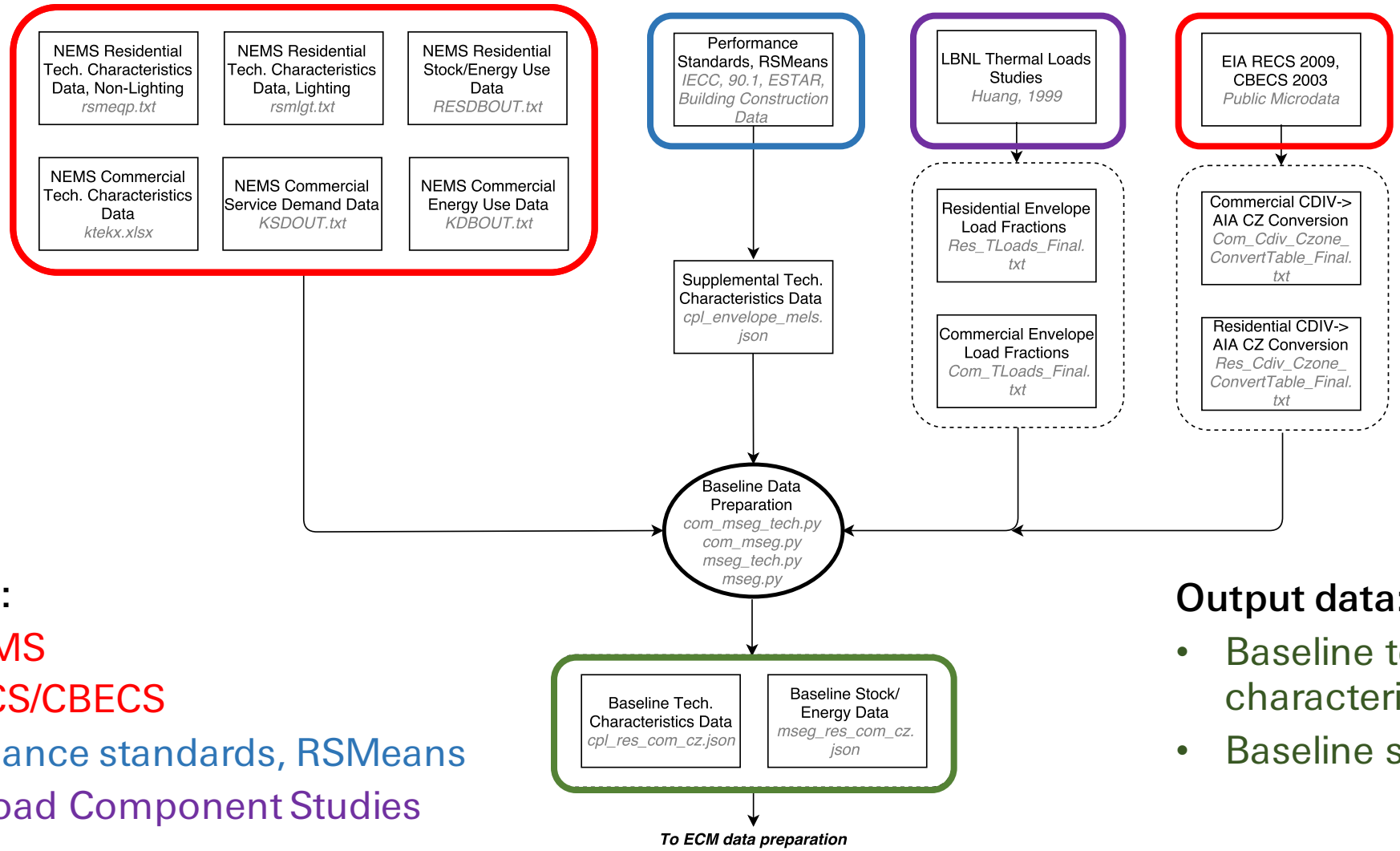


Input data:

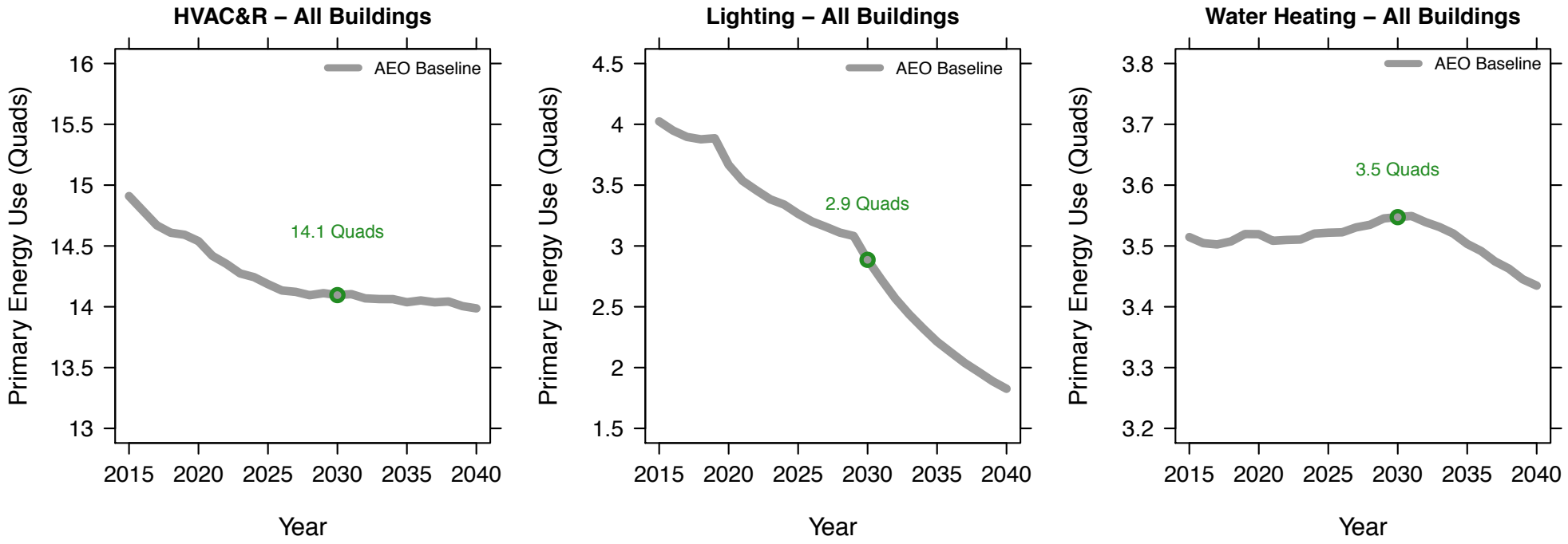
- EIA NEMS
- EIA RECS/CBECS
- Performance standards, RSMeans
- LBNL Load Component Studies

Output data:

- Baseline technology characteristics
- Baseline stock/energy use

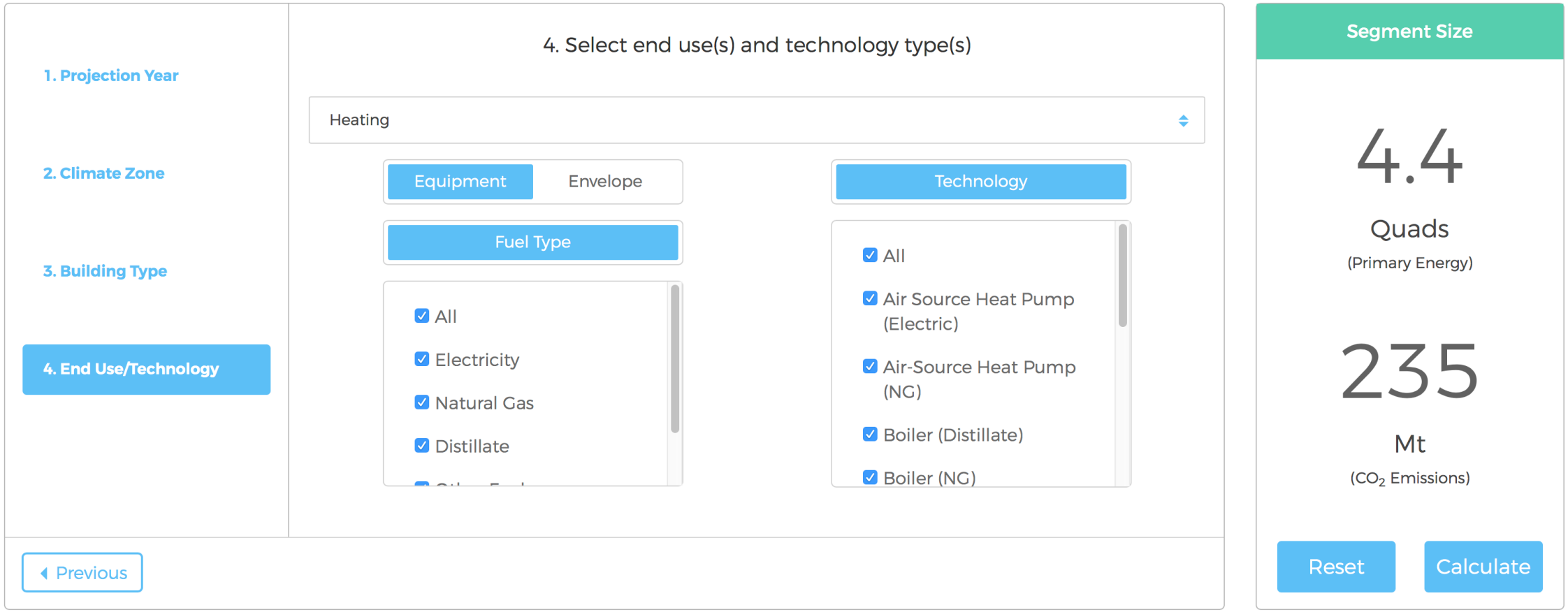
Baseline energy use ‘markets’ are defined by climate, building type/vintage, fuel, and end use

- Energy Information Administration (EIA) Annual Energy Outlook (AEO) baselines represent “business-as-usual” energy use projections to 2050; updated annually
- Baselines split by climate, building type/vintage, fuel, end use, technology
- Energy use baselines can be translated to other variables (CO_2, cost)

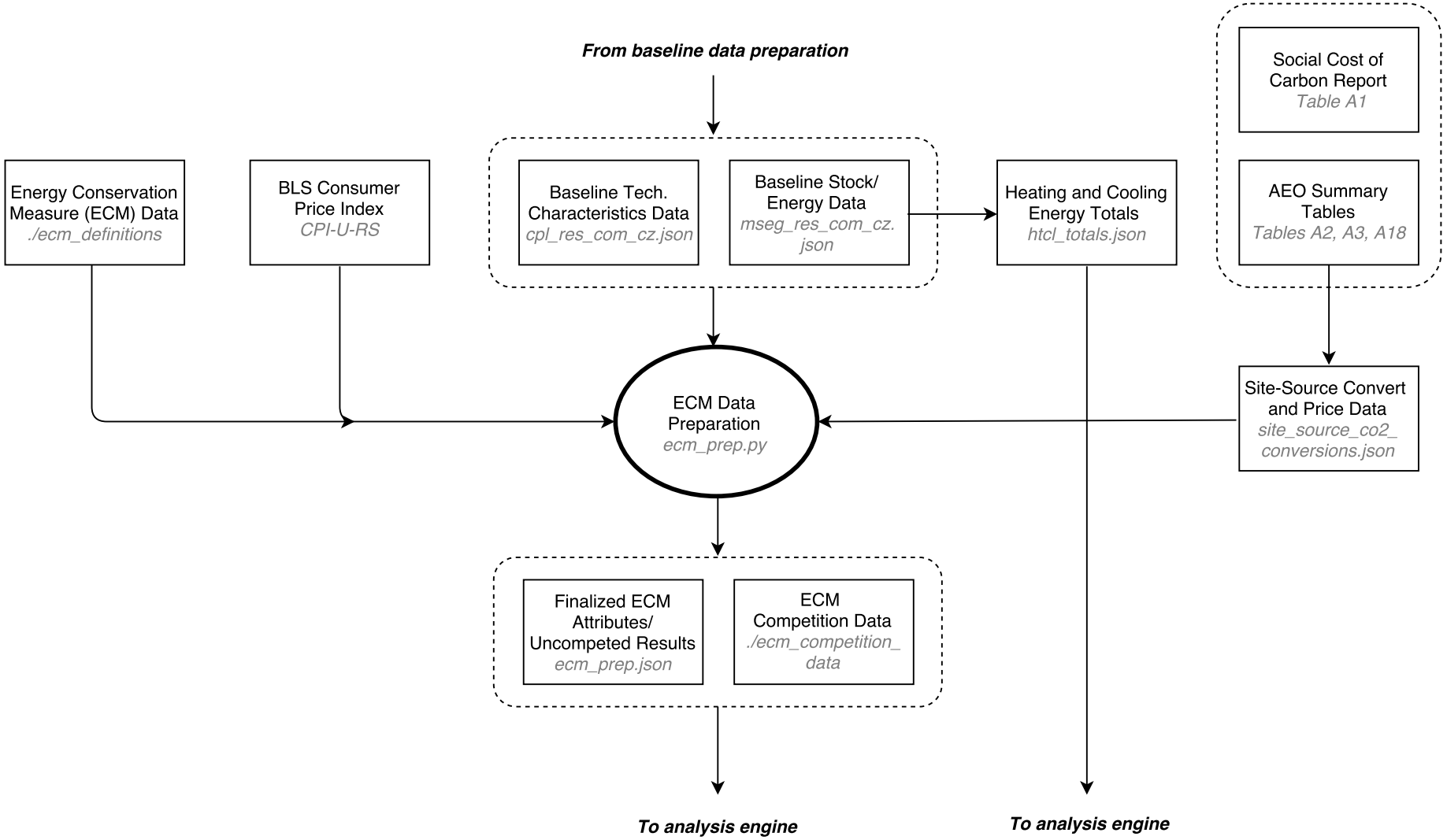


Use the Scout Baseline Energy Calculator to estimate baseline energy use/CO_2 emissions

What are the biggest opportunities for U.S. building energy use reductions?



User-defined energy conservation measures (ECMs) are applied to baseline markets



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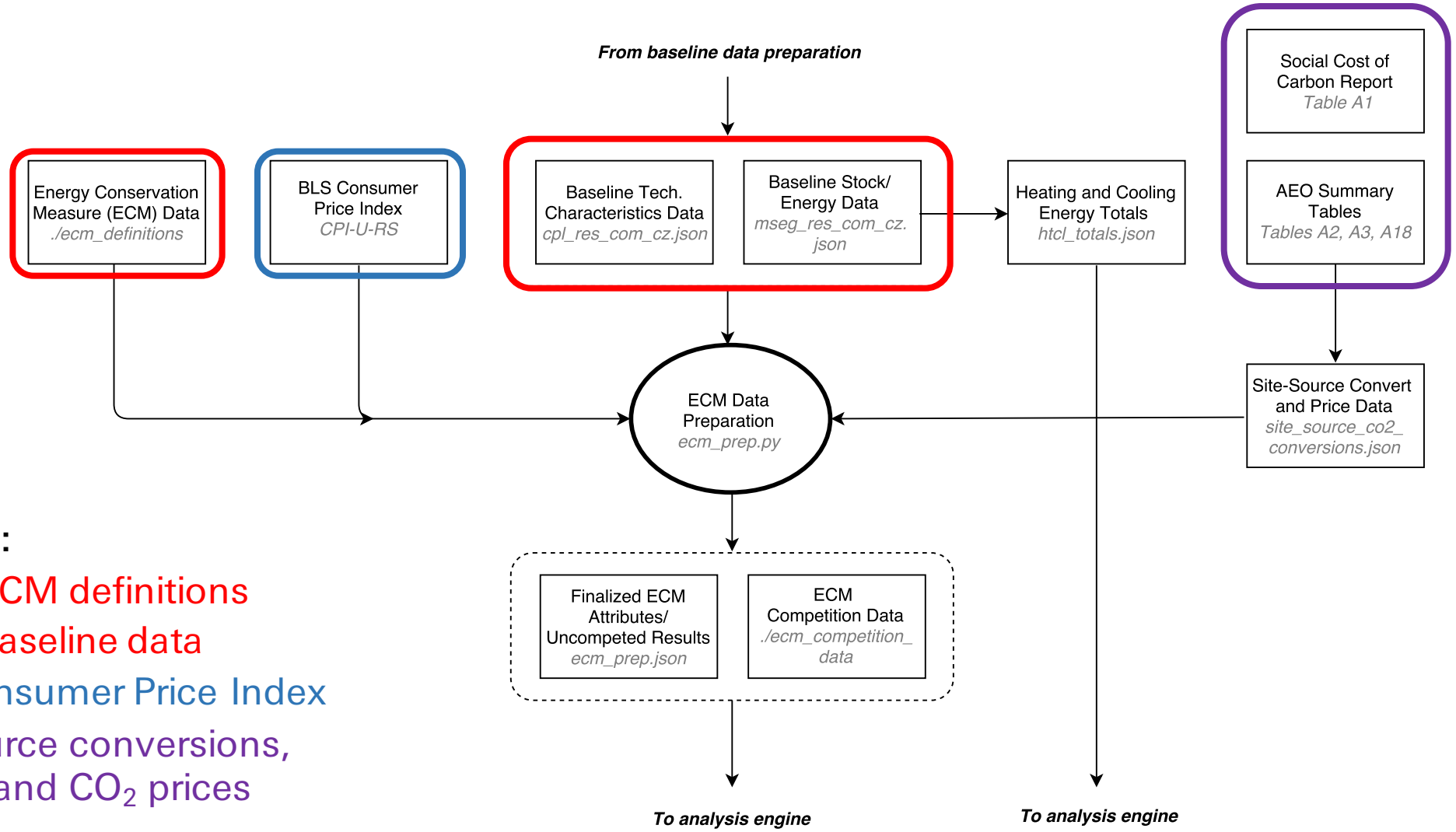

Input data:

- Scout ECM definitions
- Scout baseline data
- BLS Consumer Price Index
- Site-source conversions, energy and CO_2 prices

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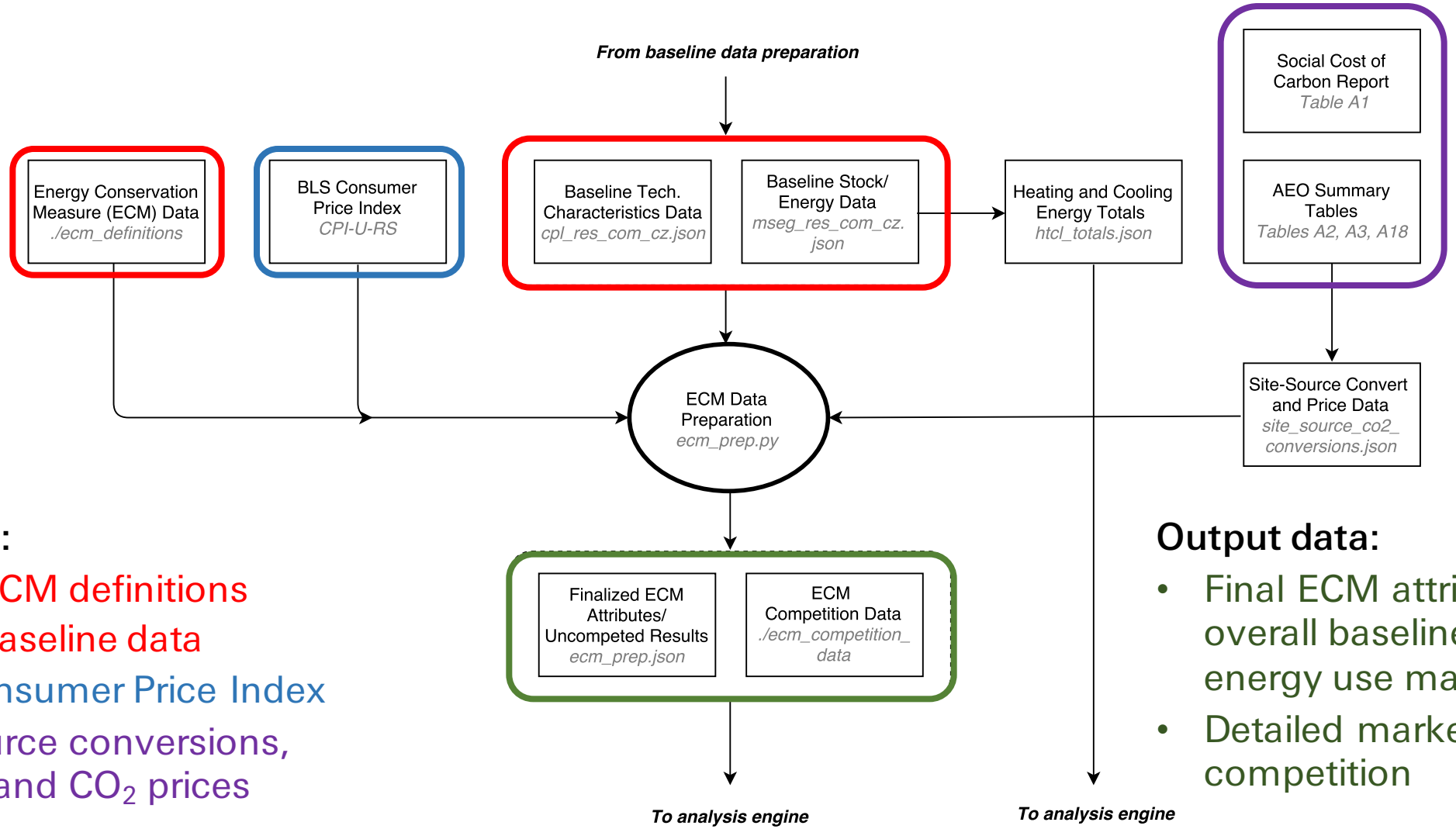


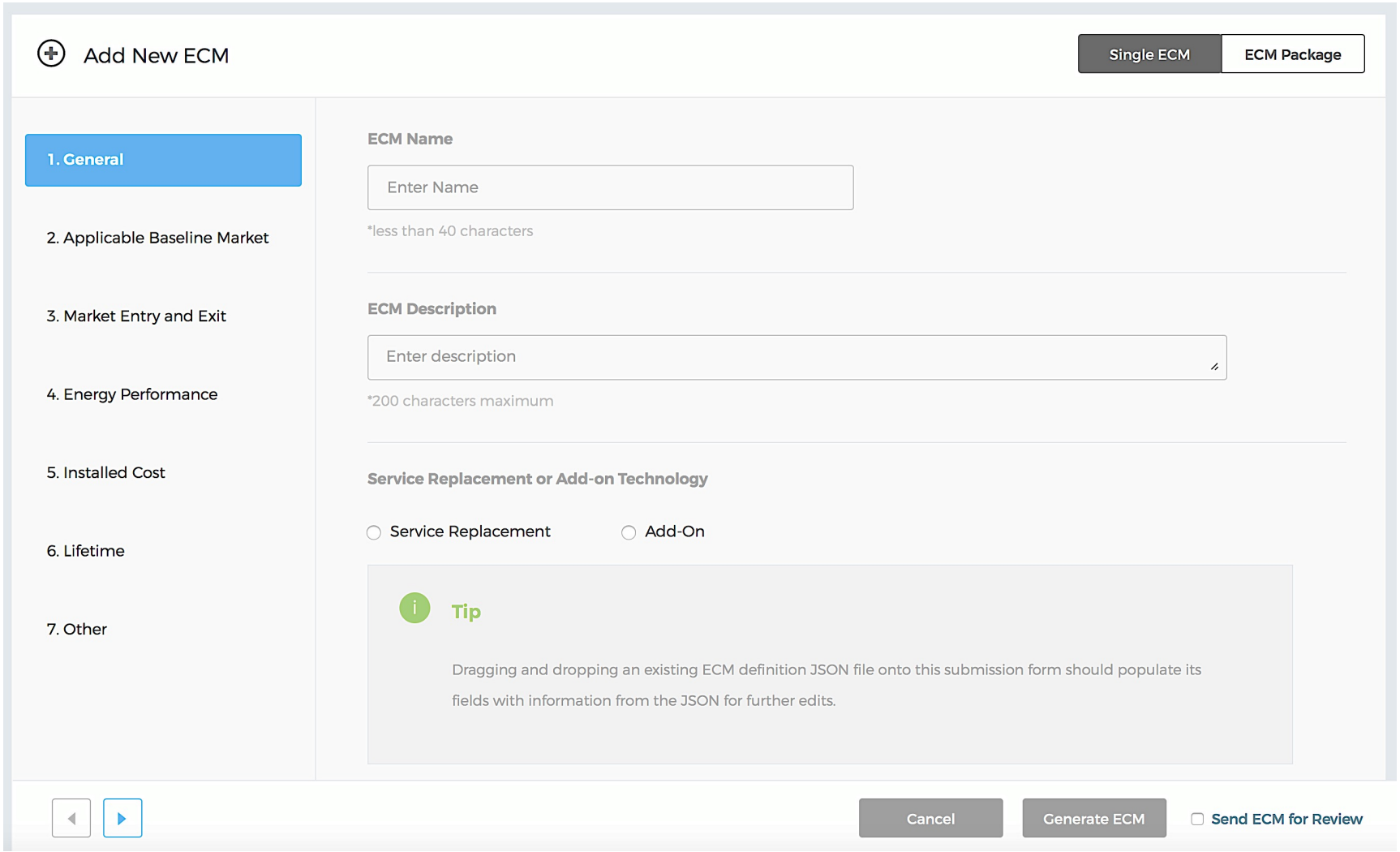
Input data:

- Scout ECM definitions
- Scout baseline data
- BLS Consumer Price Index
- Site-source conversions, energy and CO_2 prices

Output data:

- Final ECM attributes, overall baseline/'efficient' energy use markets
- Detailed market data for competition

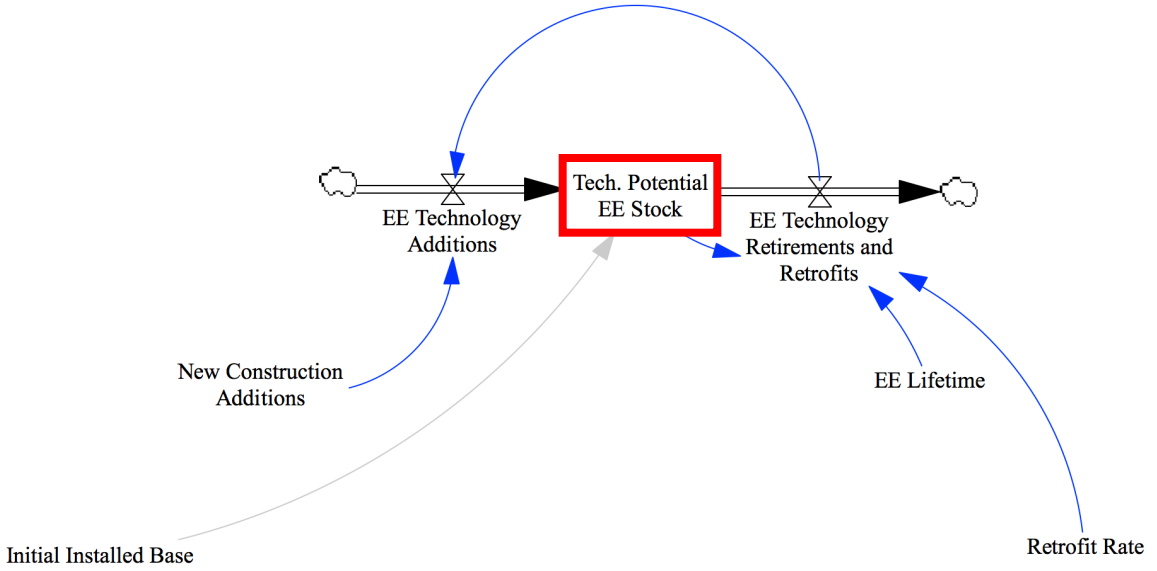
Use the Add/Edit ECM form to create your own Scout ECM definition, step-by-step



ECM penetration into baseline markets is determined by technology stocks-and-flows

Two ECM adoption cases are assumed:

- Technical Potential (TP) case
  - ECMs compete for and capture total market in market entry year, as well as all new additions to market in subsequent years



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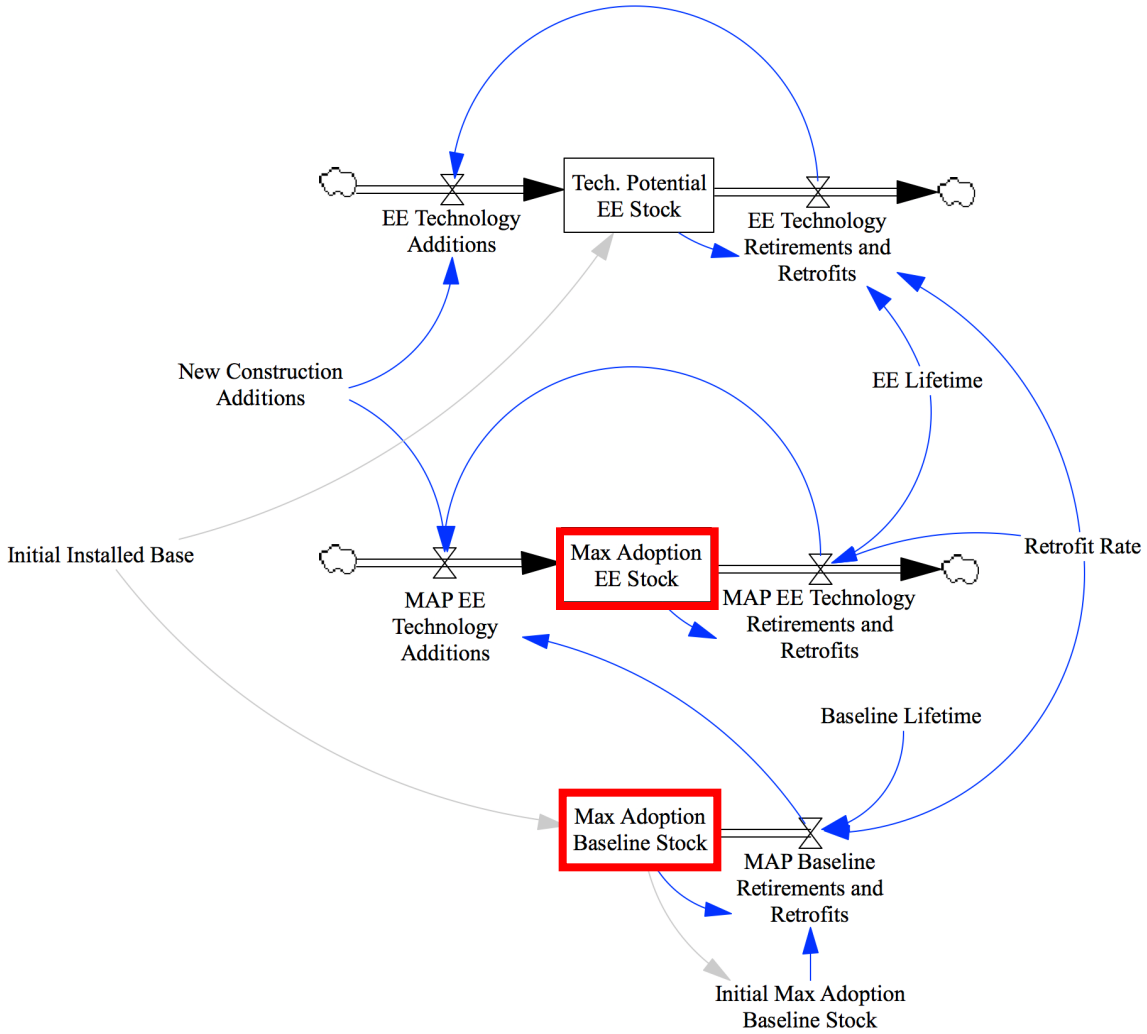
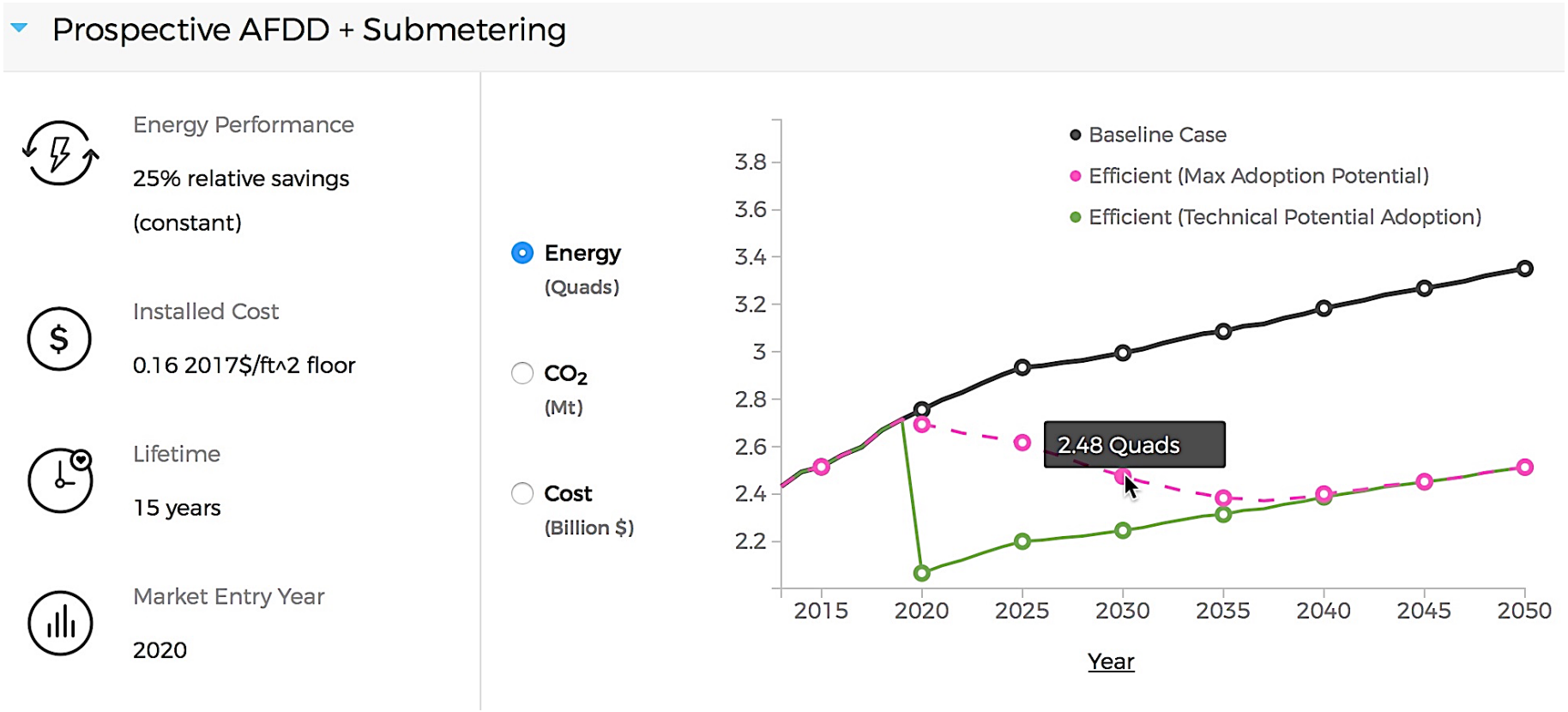
Two ECM adoption cases are assumed:

- Technical Potential (TP) case
  - ECMs compete for and capture total market in market entry year, as well as all new additions to market in subsequent years
- Max Adoption Potential (MAP) case
  - ECMs compete for and capture new, replacement, and retrofit fractions of total market annually

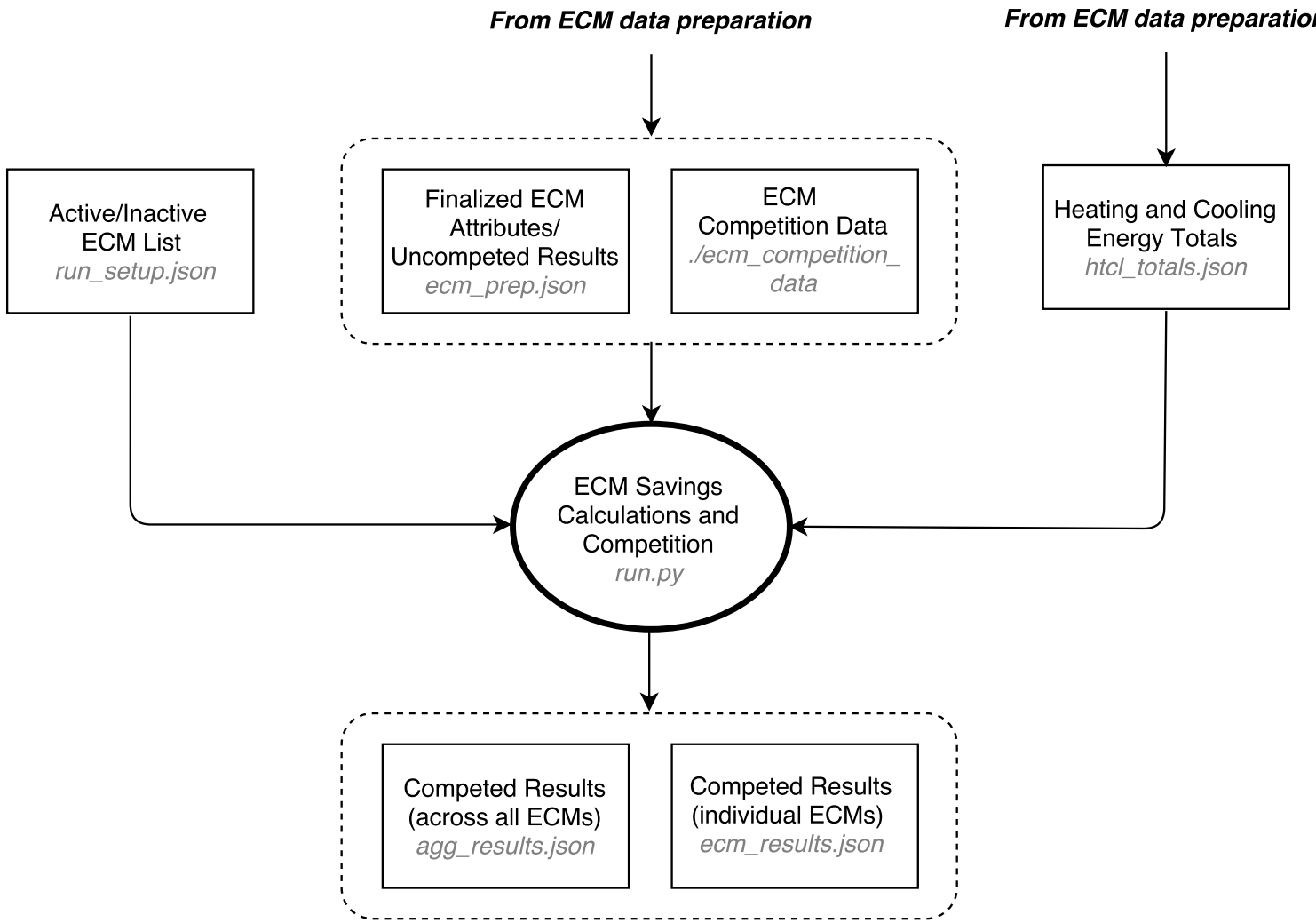


Use Scout ECM Summaries to estimate individual ECM impacts on baseline markets

How might an efficiency measure of interest impact baseline building energy use in the U.S.?



Multiple ECMs are assembled into a portfolio and competed based on cost effectiveness



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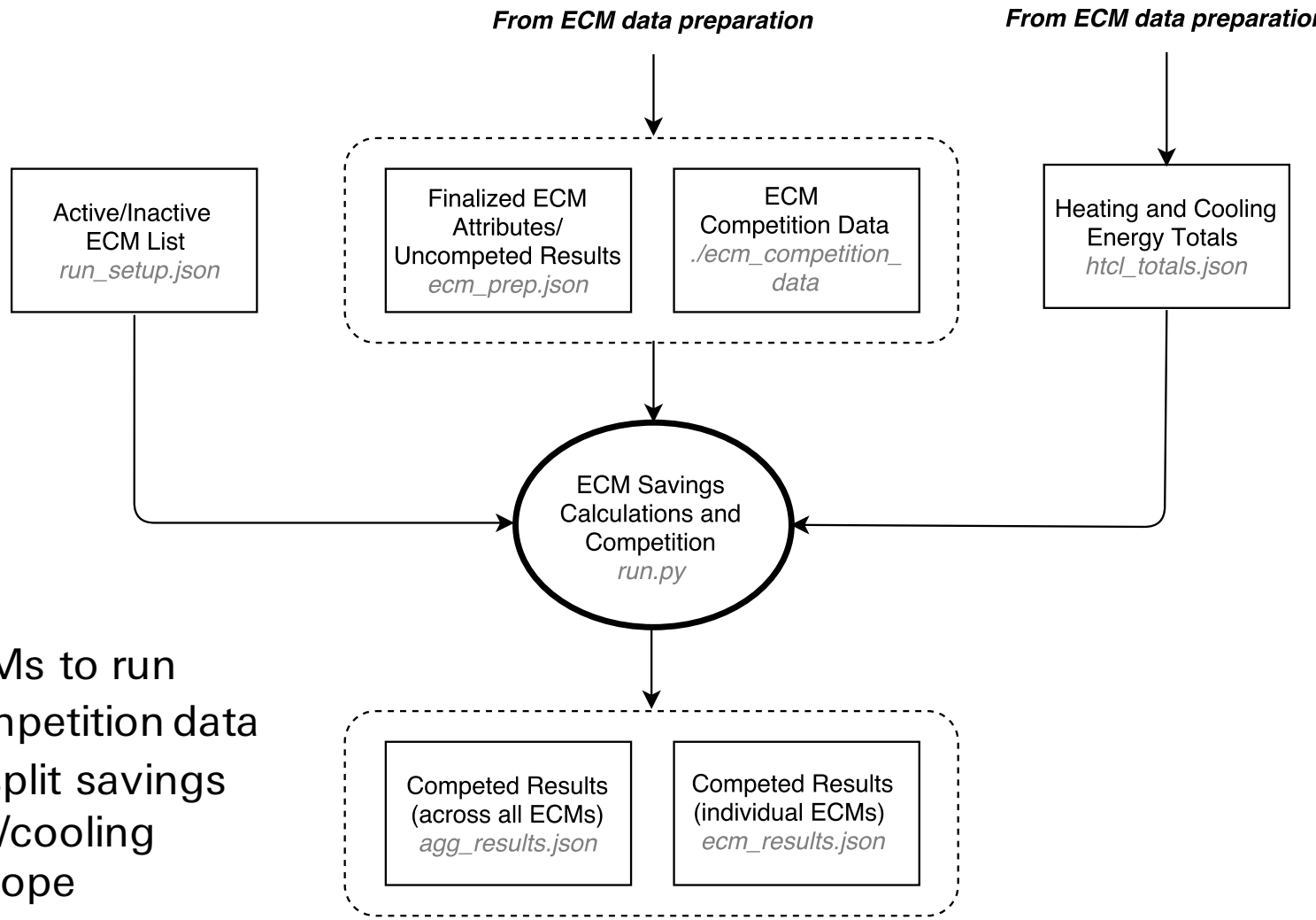

Input data:

- List of active ECMs to run
- ECM market/competition data
- Data needed to split savings between heating/cooling equipment/envelope

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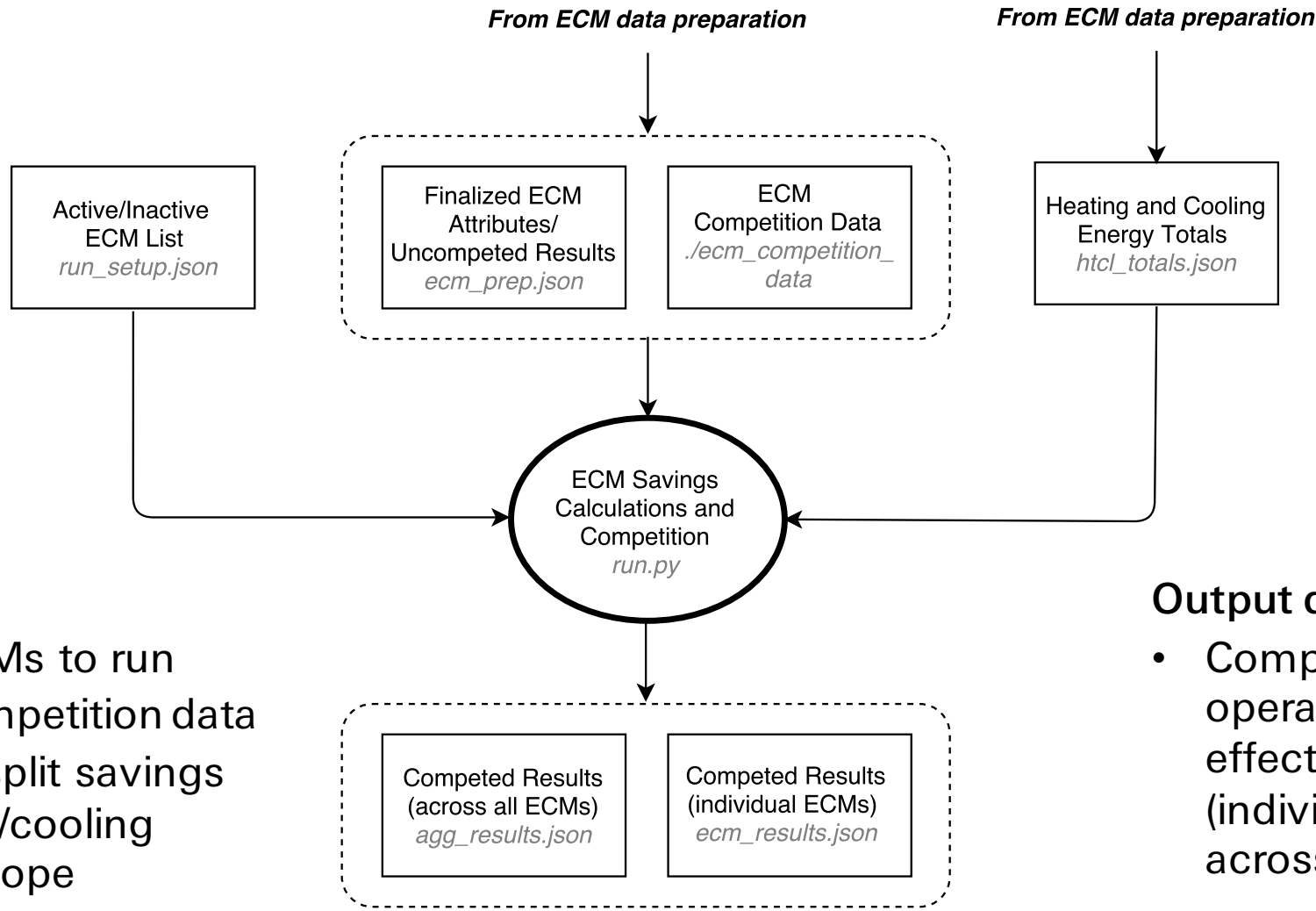


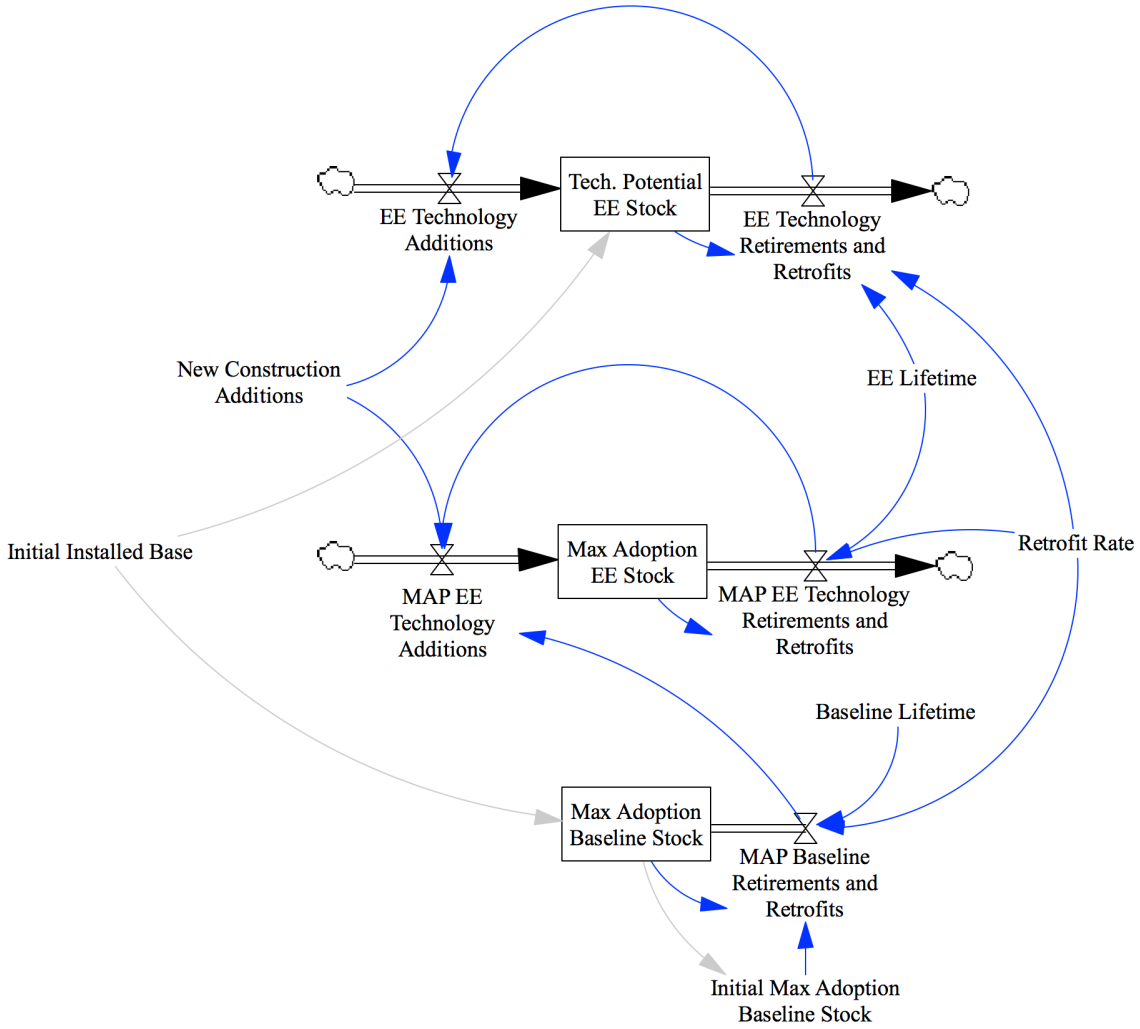
Input data:

- List of active ECMs to run
- ECM market/competition data
- Data needed to split savings between heating/cooling equipment/envelope

Output data:

- Competed energy, CO_2, operating cost, and cost effectiveness results (individual ECMs and across ECM portfolio)

ECM baseline markets are scaled down to reflect competition with overlapping ECMs



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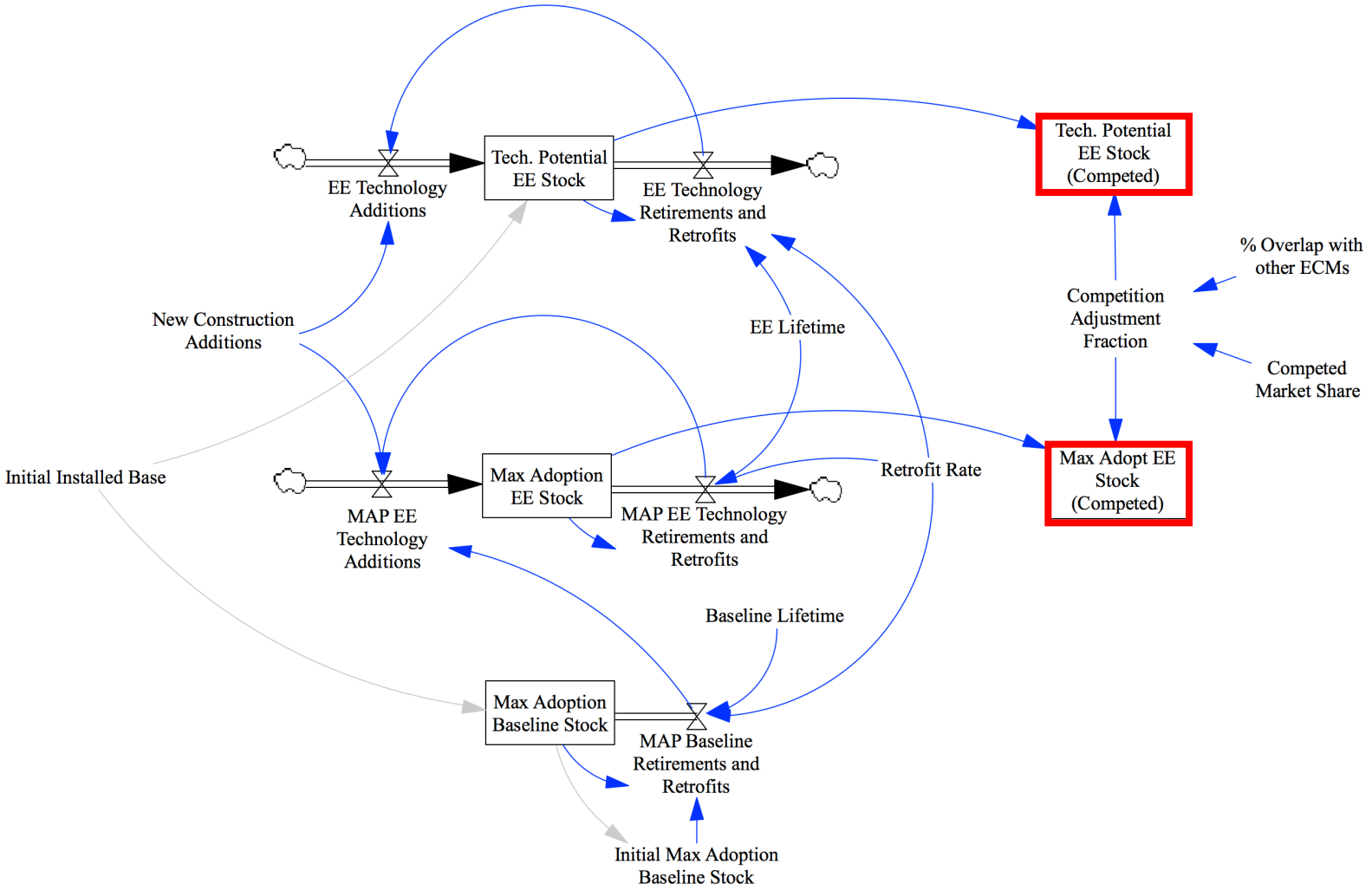


ECM baseline markets are scaled down to reflect competition with overlapping ECMs

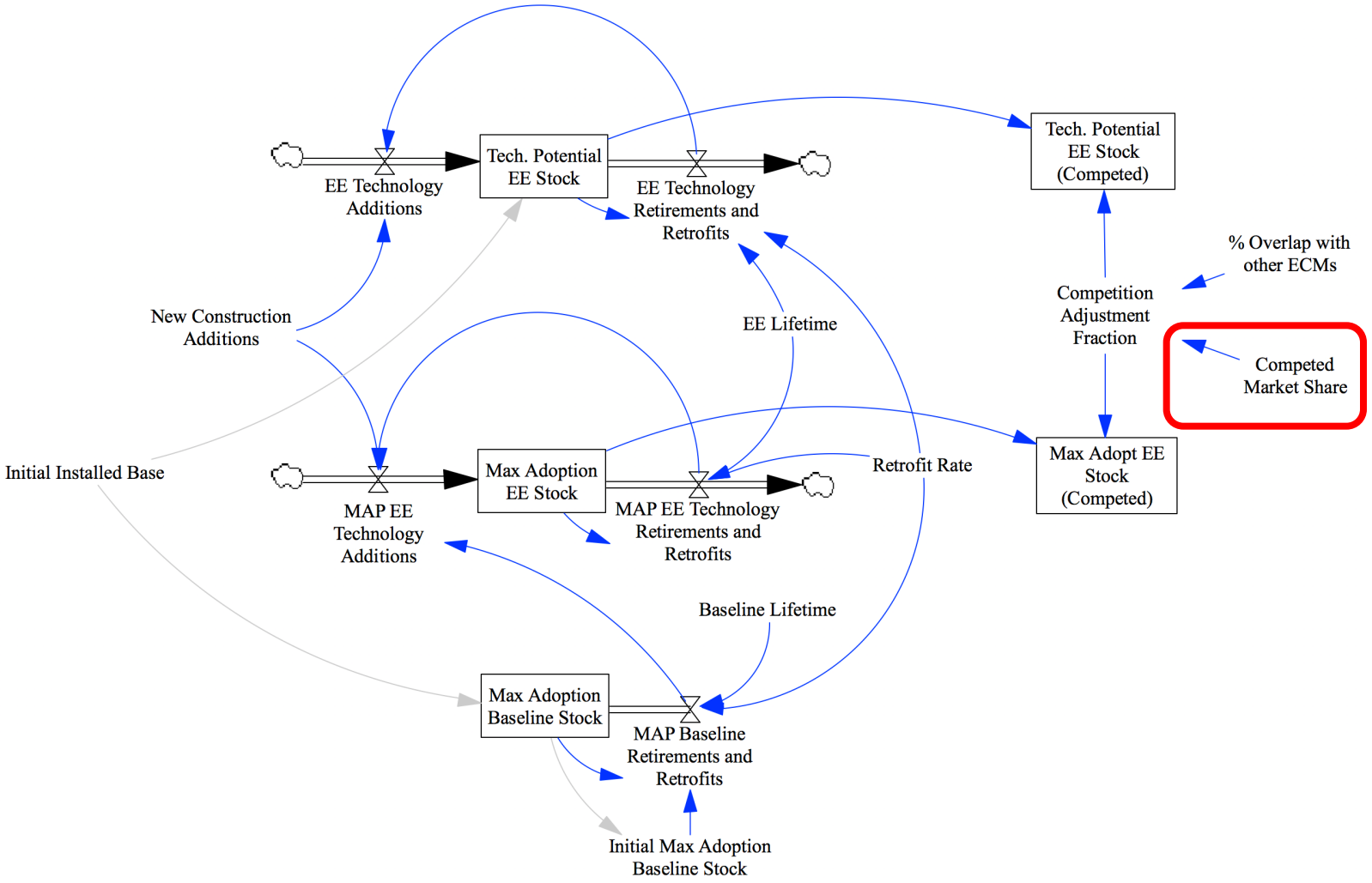
Scout uses NEMS technology choice models to represent ECM competed market shares:

- Residential (log-linear regression, Eqs. B-20, B-21):

$$Market\ Share = f(Capital\ Cost, Operating\ Cost)$$

- Commercial (cost model, Table E-1):

$$Market\ Share = f(Life\ Cycle\ Cost, Time\ Preference\ Premium)$$

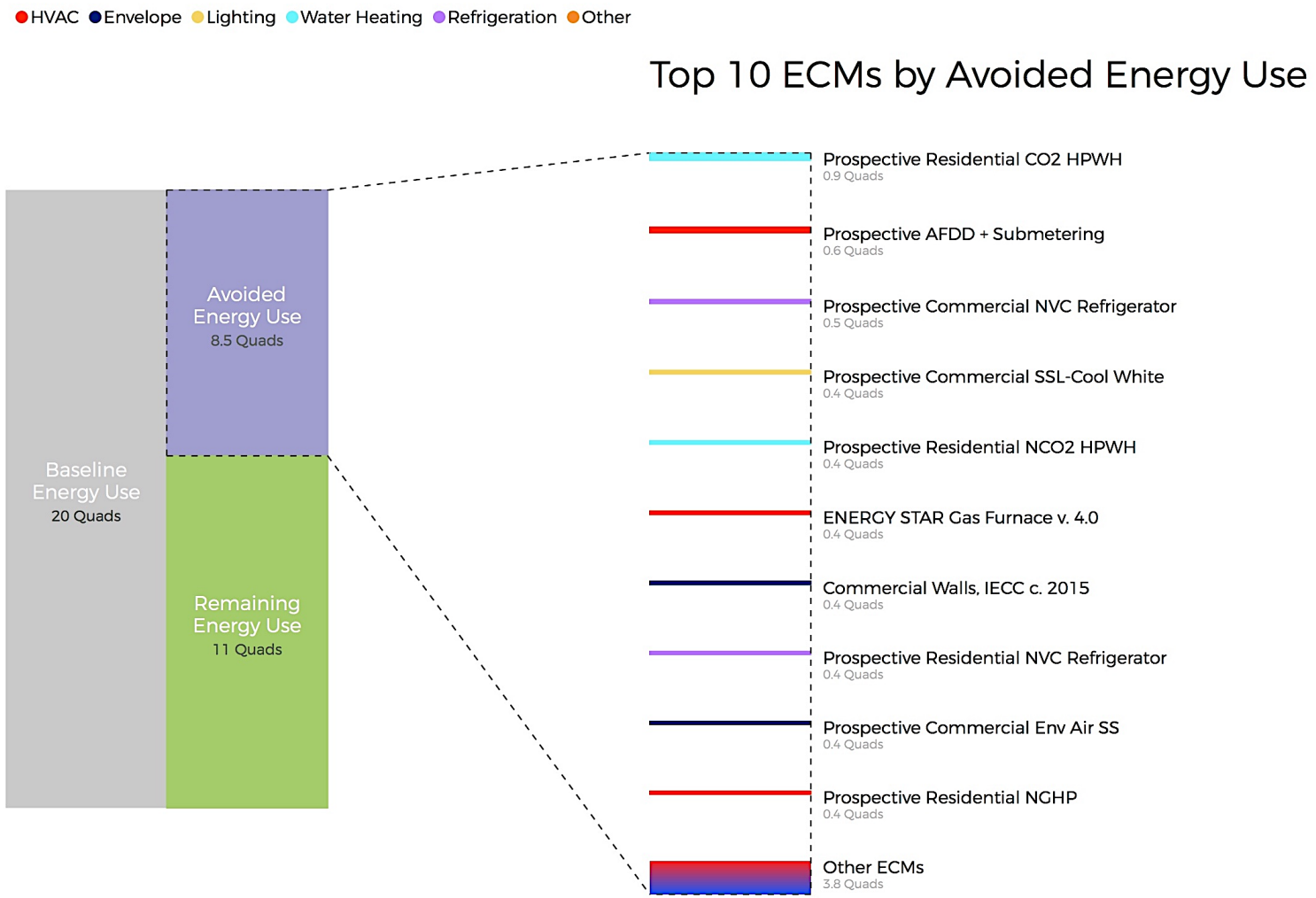


Use Scout Analysis Results bar graphs to compare individual ECM savings impacts

How does a measure of interest compare to and/or complement other measures?

In this example:

- Total 2030 energy savings of an ECM portfolio are attributed to individual ECMs
- High impact ECMs come from a variety of end uses, with two of the top five ECMs affecting water heating

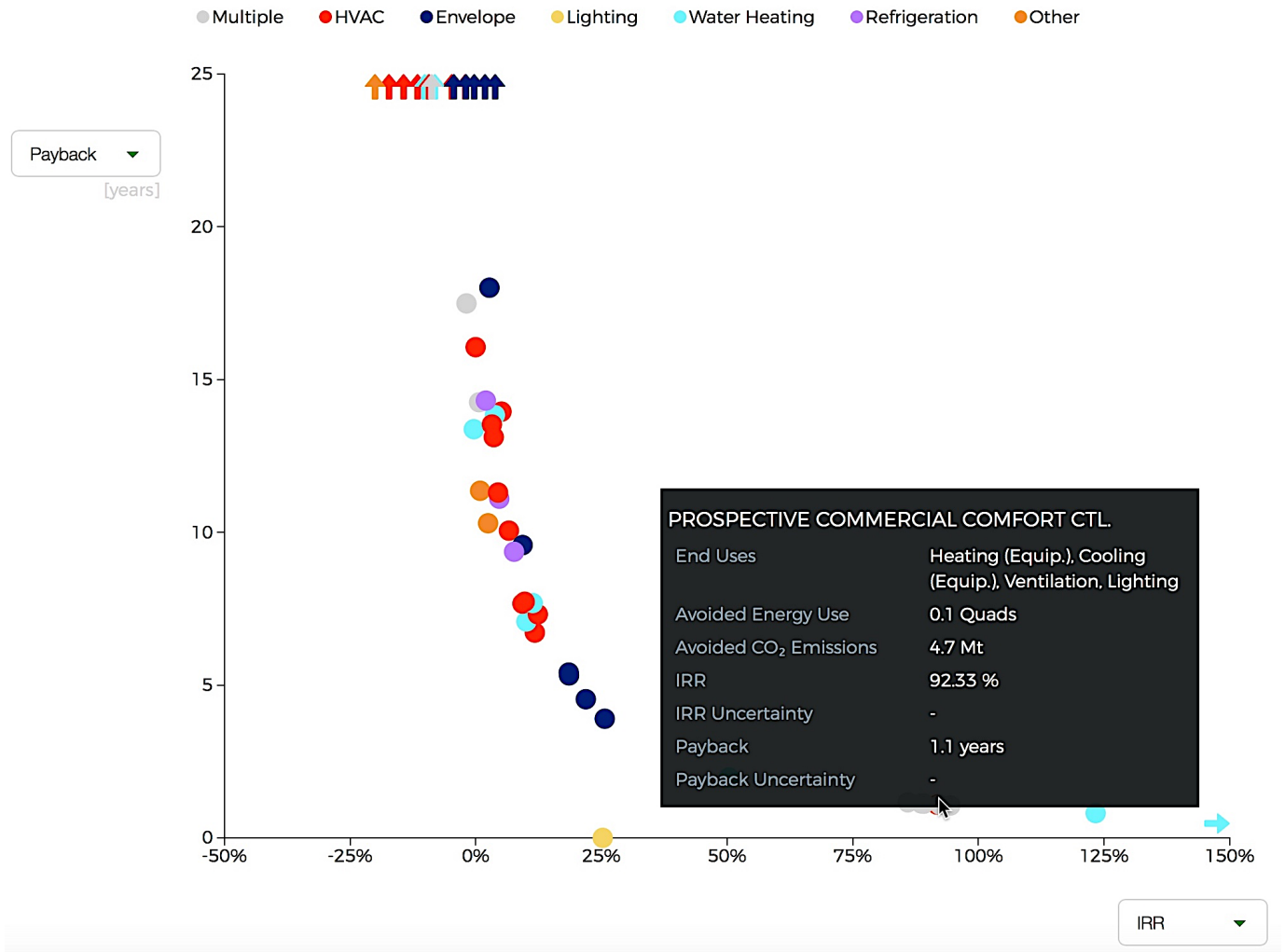


Use Scout Analysis Results scatterplots to compare individual ECM cost effectiveness

How does a measure of interest compare to and/or complement other measures?

In this example:

- The cost effectiveness of individual ECMs in 2030 is compared under two financial metrics
- Multiple controls ECMs look favorable due to aggressive one year payback targets

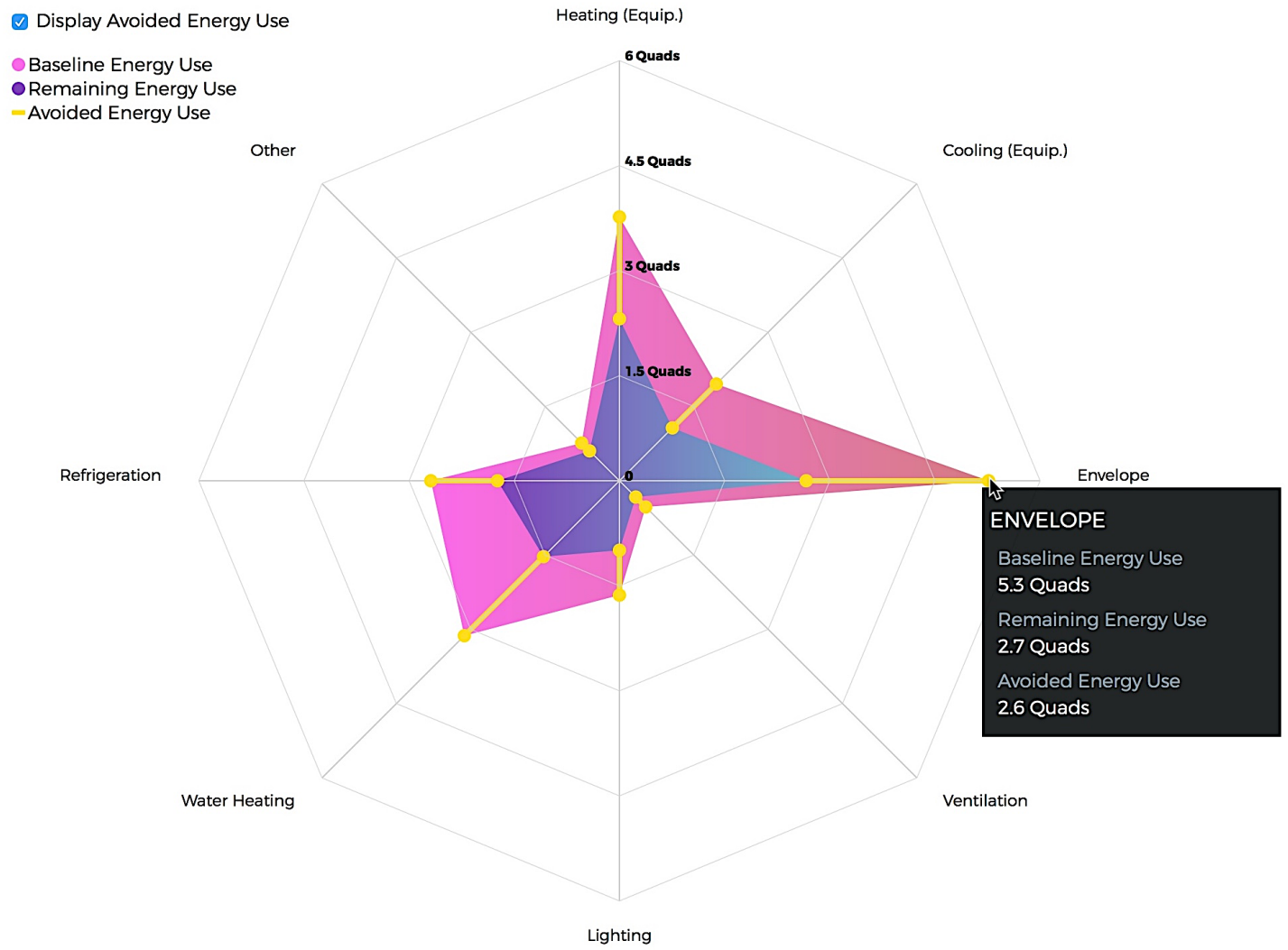


Use Scout Analysis Results radar graphs to aggregate ECM savings impacts

How does a measure of interest compare to and/or complement other measures?

In this example:

- Total 2030 energy savings of an ECM portfolio are broken down by end use
- Envelope makes the largest baseline energy market and savings contribution , followed by water heating and heating



How to get started using Scout

- Visit the Quick Start Guide[1]
  - Walks you through running a Scout analysis from start to finish
  - Pertains to the command—line—only version of Scout (published June 2017)
- Access the web UI prototype by e-mailing me (jared.langevin@lbl.gov)
  - Currently functional but being transitioned to a permanent hosting location
  - Comes with a supporting set of documentation
- Follow Scout development on GitHub
  - Access the raw code[2]
  - Use the Issues functionality[3] to flag problems with the code or ask questions

1 http://scout-bto.readthedocs.io/en/latest/quick_start_guide.html
2 https://github.com/trynthink/scout
3 https://github.com/trynthink/scout/issues/new