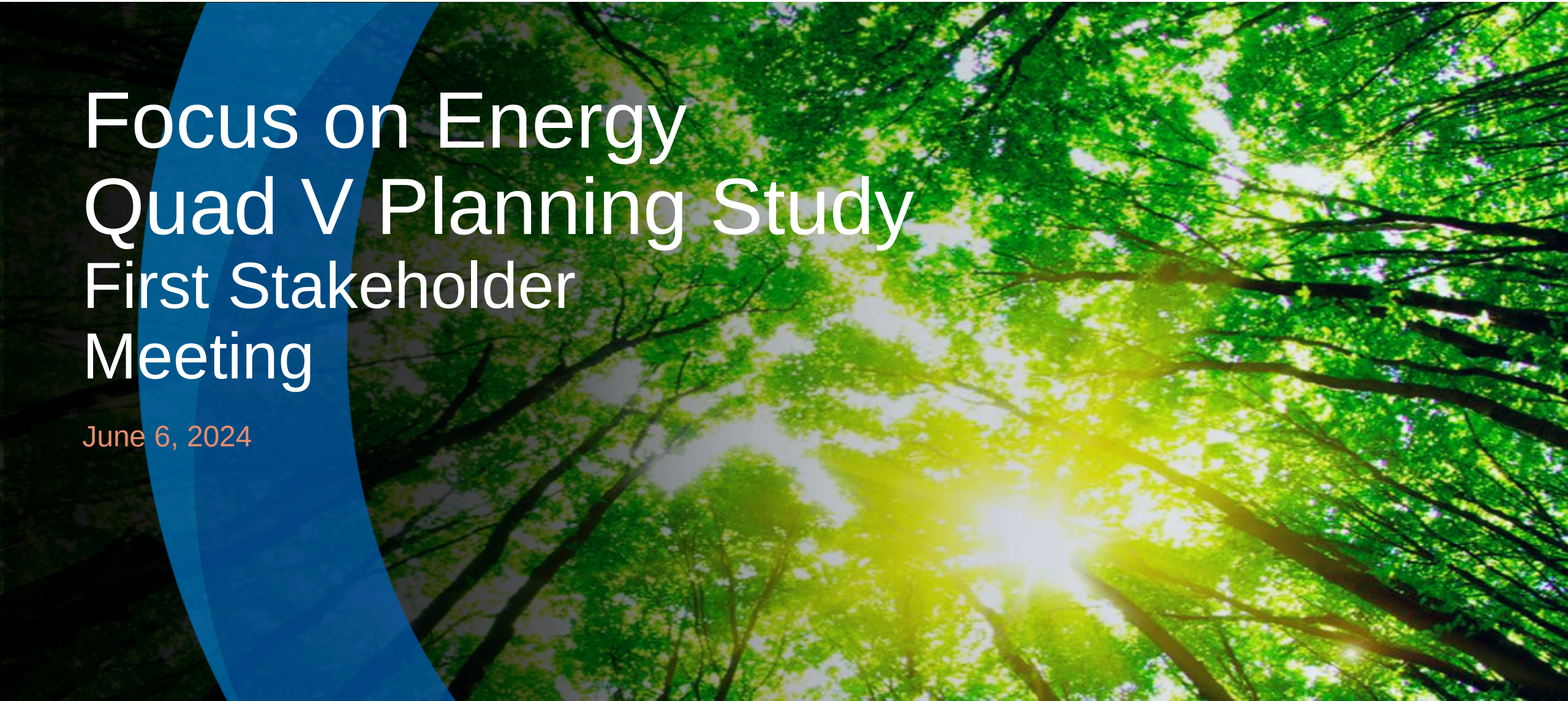
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Focus on Energy Quad V Planning Study

First Stakeholder Meeting

June 6, 2024

Agenda

1. Introductions
2. Research Questions
3. Focus Areas & Reporting Metrics
4. Methodology Overview
5. Timeline & Stakeholder Engagement

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Introductions

Introductions

PSC

Mitch Horrie



Cadmus

Jeremy Eckstein
Project Manager



Aquila Velonis
Principal Investigator



Andrew Grant
Technical Director



Casandra Guillen
Deputy Project Manager



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Quad IV Directives Recap

Emphasizing Emissions Reduction	Emphasizing Peak Demand Reduction
OP#1 – Play a larger role in cost-effectively reducing carbon emissions. Quad IV should serve as a transitional period where the program seeks to make measurable progress toward greater emphasis on reducing carbon emission.	**OP#11** – Focus shall perform research in Quad IV to assess strategies for achieving greater demand savings and better understand the value of additional demand savings.
OP#2 – Operationalize enhanced measurement and tracking of the program's carbon emissions reduction impacts.	**OP#12** – Focus shall investigate opportunities to integrate the time-varying value of energy efficiency and renewable energy into program operations.
OP#4 – Focus shall use Quad IV as a transitional period to position the program to take on a larger role in promoting beneficial electrification statewide.	**OP#13** – Adopt a winter electric peak period and begin quantifying and tracking winter electric peak savings in Quad IV.
OP#25 – Focus shall value avoided CO2 emissions using an updated market-based value.	**OP#14** - Adopt a winter natural gas peak period definition and begin quantifying and tracking winter natural gas peak savings in Quad IV.

PSC REF#: 453081

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Research Questions

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Study Themes

Energy Efficiency: Electric & Natural Gas	Economic Potential	Program Scenarios	Electrification	Peak Impact and Emissions Reporting
Technical Potential	Adoption Simulation (Optimized Potential)	Scenario Analysis	Distributed Solar	Hourly ‘Time-Value’ Impacts

Consistent with the prior study

New to this study

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Objectives & Research Questions

Objective	Research Question	Approach
1. Understand how focusing on emissions reductions could impact energy savings.	1. What are the 4- and 12-year emissions impacts of Focus on Energy program design scenarios?	• Use measure and utility generation hourly profiles to estimate emissions impacts leverage resources from MISO and the Wisconsin Strategic Energy Assessment. •Stakeholders inform measure selection/configuration and program scenario design. • Program design scenarios can shift incentives between different measures or fuel switching applications, remove or add measures from programs, or fund/defund programs. • Develop program scenarios and estimate 4- and 12-year emissions, energy, and demand impacts for each scenario. • Program scenario potential provides 4-year impacts and adoption simulations provide 12-year impacts.
	2. How cost effective are potential market interventions designed to achieve emissions impacts?	• Estimate 4-year program scenario budgets and cost effectiveness using the modified total resources cost test (mTRC). • Estimate 12-year economic potential using the mTRC for two scenarios: energy efficiency and fuel switching.
2. Understand the value of / tradeoffs between focusing on demand reduction versus energy savings.	3. How do future program designs compare to past program achievements?	• Compare last full quad program accomplishments for savings, demand reduction and emission, and budgets to program scenarios.
	4. What are the measures that have the highest potential for emission reductions?	• Estimate technical potential sort measures by emissions, energy, and demand potential, identifying measures with highest savings potential. • Estimate economic potential and sort measures by emissions, energy, and demand potential, identifying measures with highest savings potential. • Estimate adoption and program potential and sort measures with highest impacts (although potential impacts will also depend on program scenario design).

Objectives & Research Questions

Objective	Research Question	Approach
3. Understand the implications of potential energy, demand, and emission reduction potential in Wisconsin, particularly income-qualified customers.	5. What is the energy, demand, and emissions reduction potential for specific customer segments?	Provide energy and emissions impacts for the following segments: • Residential: single family, multifamily, and manufactured homes • Residential: Income qualified, standard income • Commercial: office, retail, restaurant, hospitals, lodging, grocery, schools, government, non-profit organizations, and miscellaneous building • Agricultural • Industrial Show results by utility service territory
4. Understand the options for and potential benefits of policy and programmatic changes that promote further fuel switching.	6. What is the technical, economic, adoption, and program scenario potential for fuel switching measures?	• Estimate technical and economic potential for energy efficiency and fuel-switching scenarios. • Include fuel-switching measures that compete for participation / installations with energy efficiency measures in adoption simulations and program scenario potential. • Estimate impacts from participation / adoption of electrification measures in adoption simulations and program scenario potential.
	7. What are the relative emissions, demand, and energy savings impacts from measures when used in fuel-switching versus energy efficiency applications.	• Estimate technical and economic potential for energy efficiency and fuel-switching scenarios and compare results for measures with a fuel-switching option (i.e. heat pumps, heat pump water heaters).

Objectives & Research Questions

Objective	Research Question	Approach
5. Understand how the Inflation Reduction Act (IRA) could impact programmatic uptake for Focus on Energy programs and the best path to complement its implementation.	8. How much of Wisconsin's technical and economic energy efficiency, electrification, and distributed solar potential do federal programs incentivize?	• Identify measures that receive federal tax credits and incentives. • Estimate technical and economic potential from measures with federal incentives (do not apply caps to tax credits). Federal incentives include tax credits and rebates from IRA.
	9. What are the emissions, demand, and energy impact of different program configurations considering allocation of federal and Focus on energy incentives?	• Design program scenarios considering allocation of federal and Focus incentives. • Compare 4- and12-year emissions, peak demand, and energy program design and simulation results.

Objectives & Research Questions

Objective	Research Question	Approach
6. Contextualize study findings to inform program goals.	10. What are trends in energy efficiency program cost of acquisition of savings?	• Select six utilities or state programs (including programs in the Midwest and programs that emphasize electrification) to gather data on. • Gather cost and savings metrics for selected utilities and estimate energy efficiency acquisition costs for past 5 years.
	11. How does Focus on Energy cost of acquisition trends compare to other programs, nationally and in the Midwest?	• Compare Focus on Energy acquisition cost trends to six selected utilities.
	12. What are the savings and cost of acquisition trends by sector?	• Analyze historical and estimated Focus on Energy acquisition costs by sector.
	13. For states that have increased their emphasis on electrification, how has cost of acquisition of savings changed?	• Estimate acquisition costs trends for utilities with electrification focus (identified as part of RQ 14).



Focus Areas & Reporting Metrics

Planning Study Priorities and Scope

Estimate potential impacts on:
Gas and electric loads, emissions, and electric and gas peak demand for specific customer segments

From

Possible program configurations with different focuses (emissions, peak demand, electrification) and federal incentives

And

Contextualize findings to inform decision making

Compared to the last study this study will:

- Emphasize hourly load shapes for peak demand and emissions impacts
- More closely align study measures with current and future program delivery
- Enhance adoption simulation to include multiple economic drivers and leverage past program data
- Develop program planning scenarios to estimate 4-year program impacts, budgets, and cost effectiveness
- Report impacts in fuel-agnostic metrics
- Include distributed solar along side energy efficiency/ electrification measures

Energy Consumer Segments and Impacts Measured

Segments

Sectors

Single-family

Multifamily

Manufactured Homes

Standard Commercial

Institutional Commercial

(Schools, Non-Profit Organizations, Government, Hospitals)

Industrial

Agricultural

Income Strata

Standard

Income Qualified

Building Vintages

New

Existing

Geography

Utility service area

(small utilities rolled up)

Impact Measurements

Reporting Metrics / Measures

Electric Energy Efficiency and Distributed Solar

MMBtu & MWh, MW Winter / Summer Peak, GHG emissions, incentive and program budgets, units

Electrification

MMBtu & MWh & therms, MW Winter / Summer Peak and therm-day Peak, GHG emissions, incentive and program budgets, units

Gas Energy Efficiency

MMBtu & therms, therm-day Peak, GHG emissions, incentive and program budgets, units

Electric to Gas Fuel Switching Considerations

Study will account for the increases in electric load and decreases in gas load in impact reporting and cost-effectiveness testing

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Program Planning Scenarios



Study will develop **six** program planning **scenarios** in consultation with stakeholders by **varying program parameters** (measures incentives) and **market conditions** (measure costs, acceptance)

Scenarios designed to address study research questions

4-Year Program Scenarios

Provides view into possible program design

- MWh, therm, MMBtu, CO_2, MW and therm-day impacts from Focus on Energy program measures
- Program budgets and cost effectiveness

12-Year Adoption Simulation

Long-term impacts of program design and other market drivers

- Impacts from Focus on Energy measures **AND** non-program measures

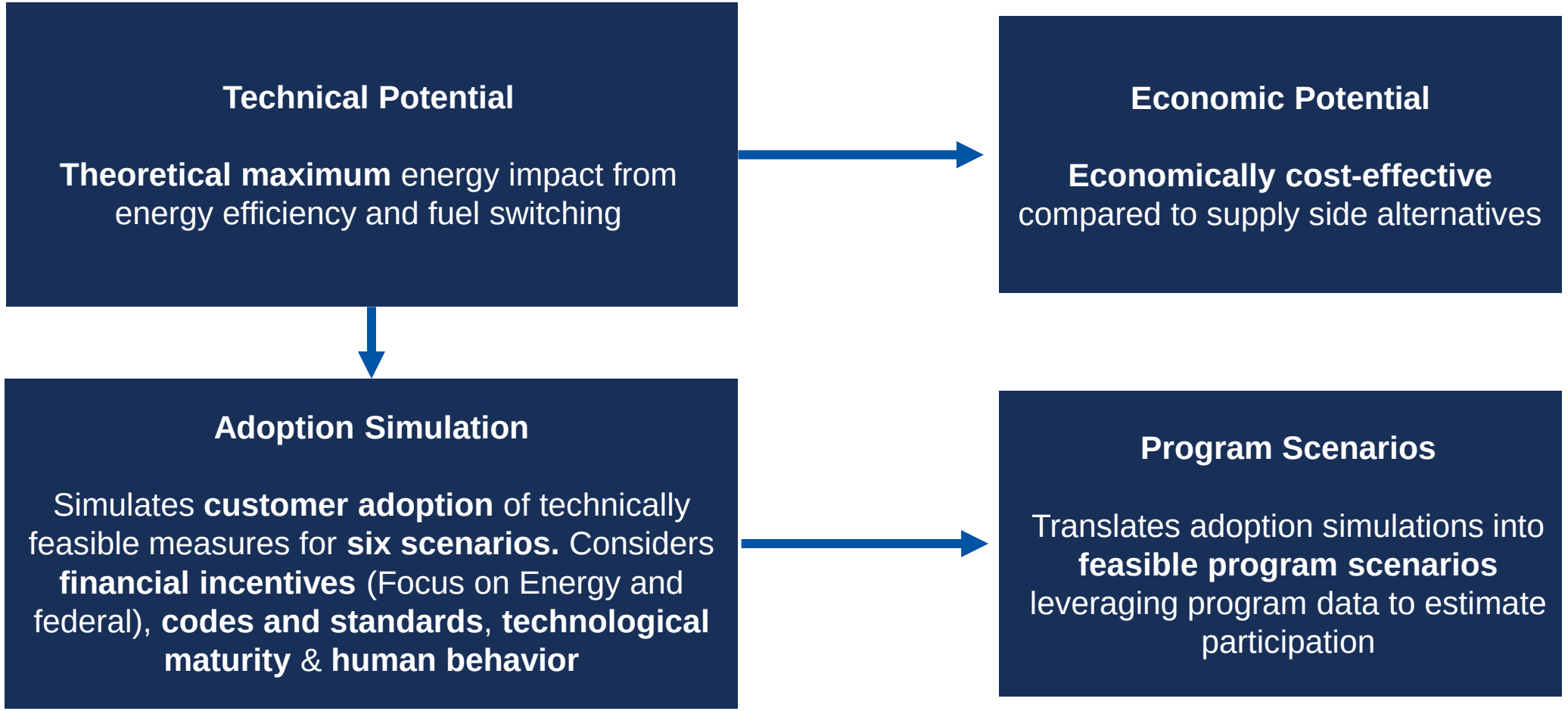
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Methodology Overview

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Opportunities Estimated



Potential Study does not provide program targets

Program targets are developed based in part on achievable potential through comprehensive planning process

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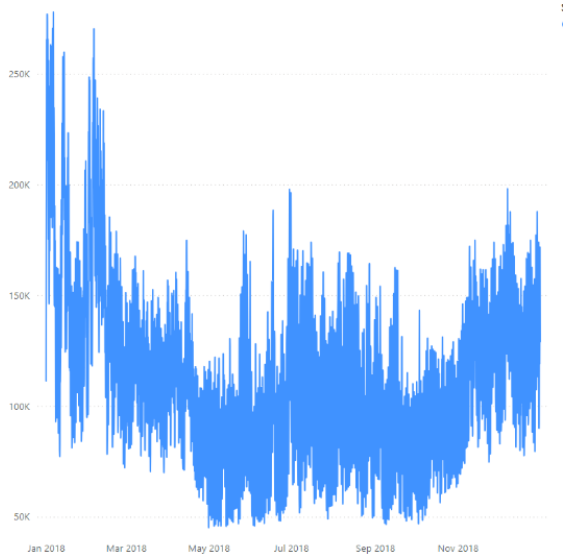
Peak Impact and Emissions Reporting

Measure characterization will include hourly impacts to match to hourly **utility market characteristics**

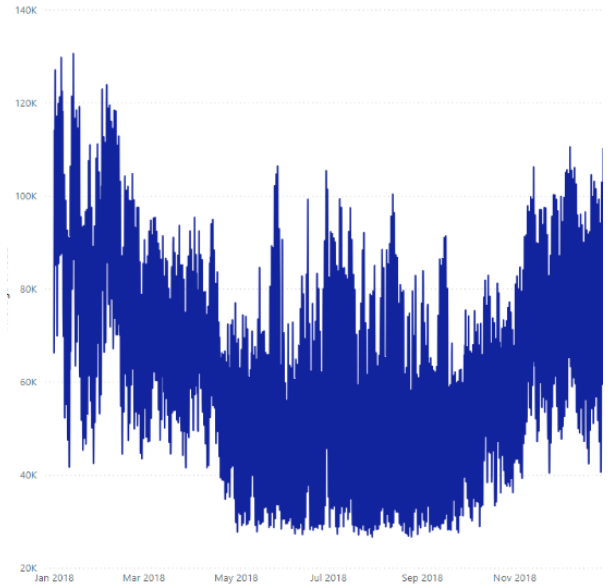
To estimate **peak demand** impacts study will leverage utility **system load shapes** and **peak definitions**

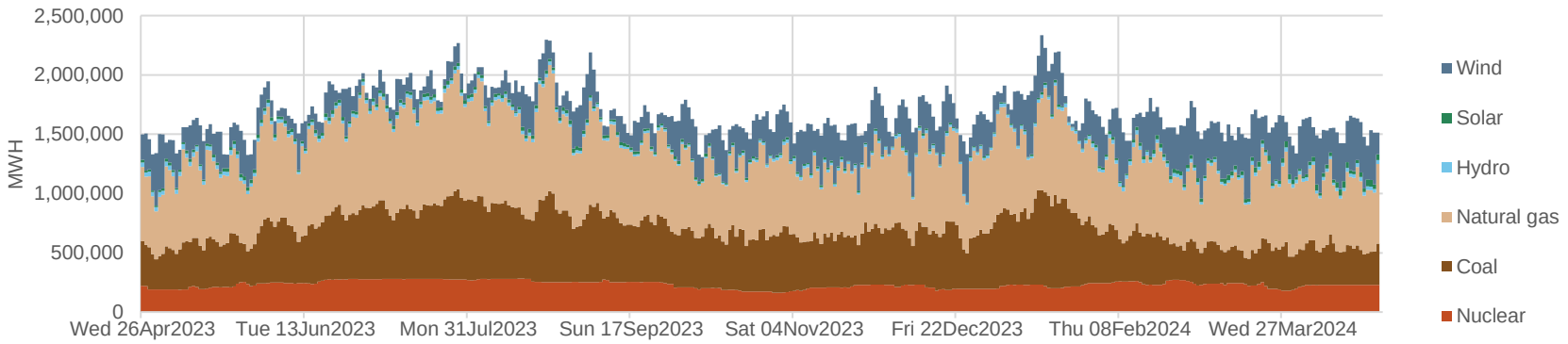
To estimate **emissions** impacts the study will leverage **hourly utility generation profiles, generator emissions factors**, and **current and planned generation mix**

Space Heat Pump – Single Family



Heat Pump Water Heater – Manufactured Home



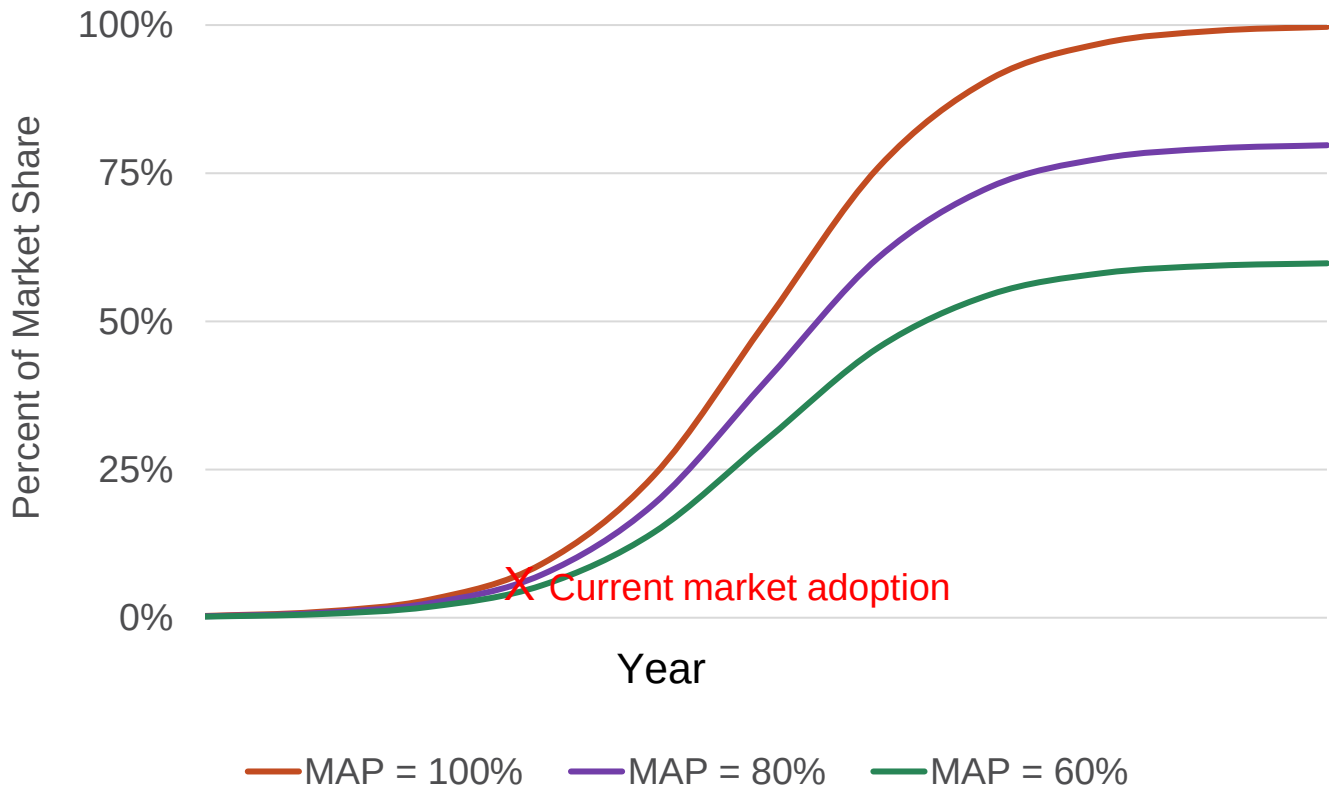


Source: U.S. Energy Information Administration, Form EIA-930, 'Hourly and Daily Balancing Authority Operations Report'

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Measure Adoption Simulations

The study will apply an adoption simulation mechanism to estimate 4- and 12-year market adoption of measures. The methodology allows the study to incorporate a range of adoption drivers, including Focus on Energy and IRA incentives.



Market adoption simulation will apply:

1. Historical data to estimate shape of adoption S-Curve
2. Technical potential analysis to estimate the size of the market for measures
3. Measure saturation data to estimate the position of the measure on the S-Curve
4. Survey data to inform the Maximum Market Penetration (MAP) of a measure under different conditions and for different customer classes

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Cost-Effectiveness & Carbon Cost

2025 Planning Study Economic Potential

As with the previous potential study, economic potential using the Modified Total Resource Test (mTRC)

Costs: incremental measure equipment cost and program administrative cost

Benefits: avoided energy supply costs, non-energy benefits

To estimate Economic Potential's sensitivity to carbon cost, the study will estimate economic potential at different carbon costs.

Incremental measure / labor costs: from measure characterization research

Administrative costs: estimated on historical data

Non-energy benefits: avoided emissions, reduced water use

Avoided energy supply costs: from Focus on Energy documentation

Gas to Electric Fuel Switching Considerations

Avoided energy supply costs will consider both reduction in fossil fuel usage and the increase in electric energy usage

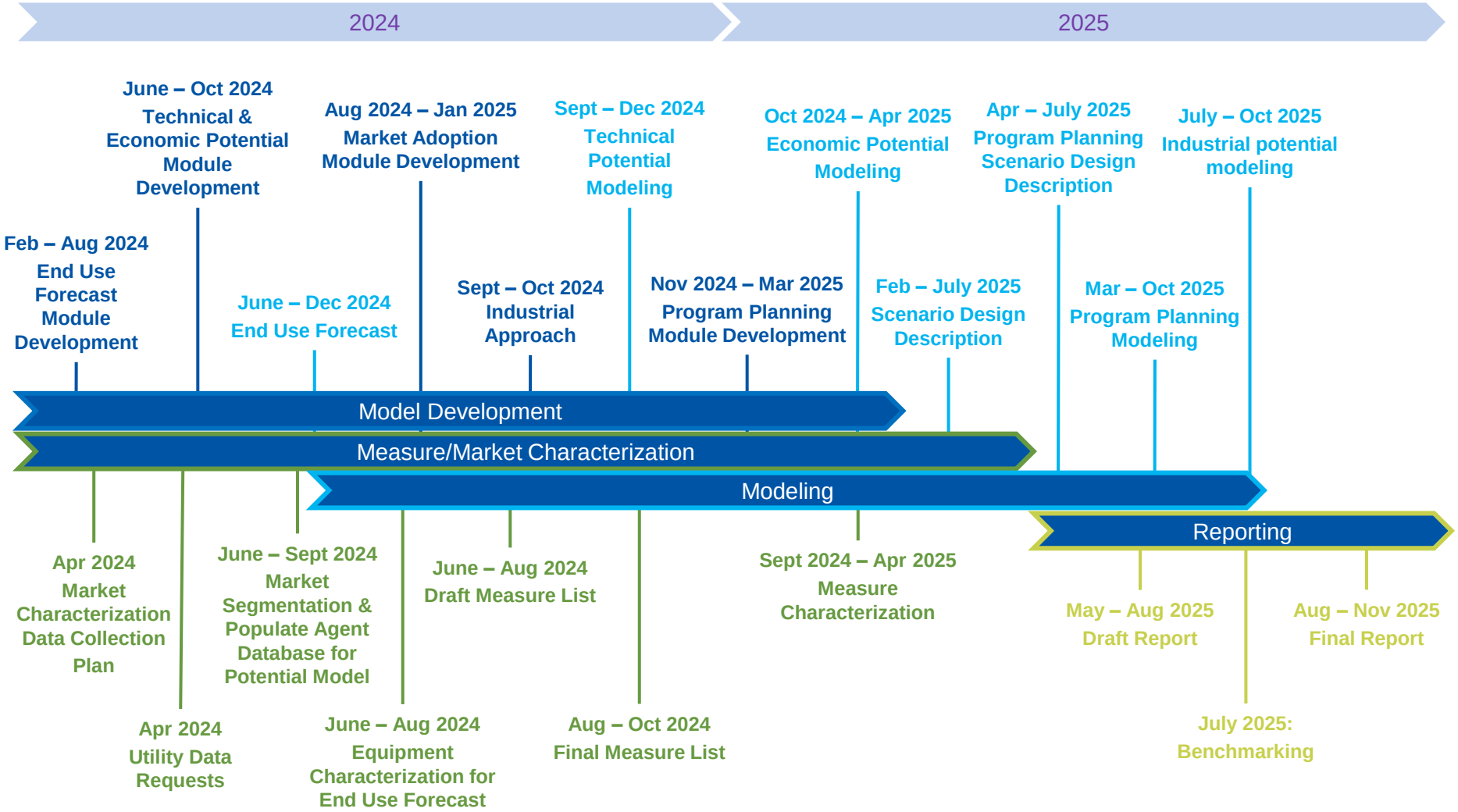
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Study Timeline & Stakeholder Engagement

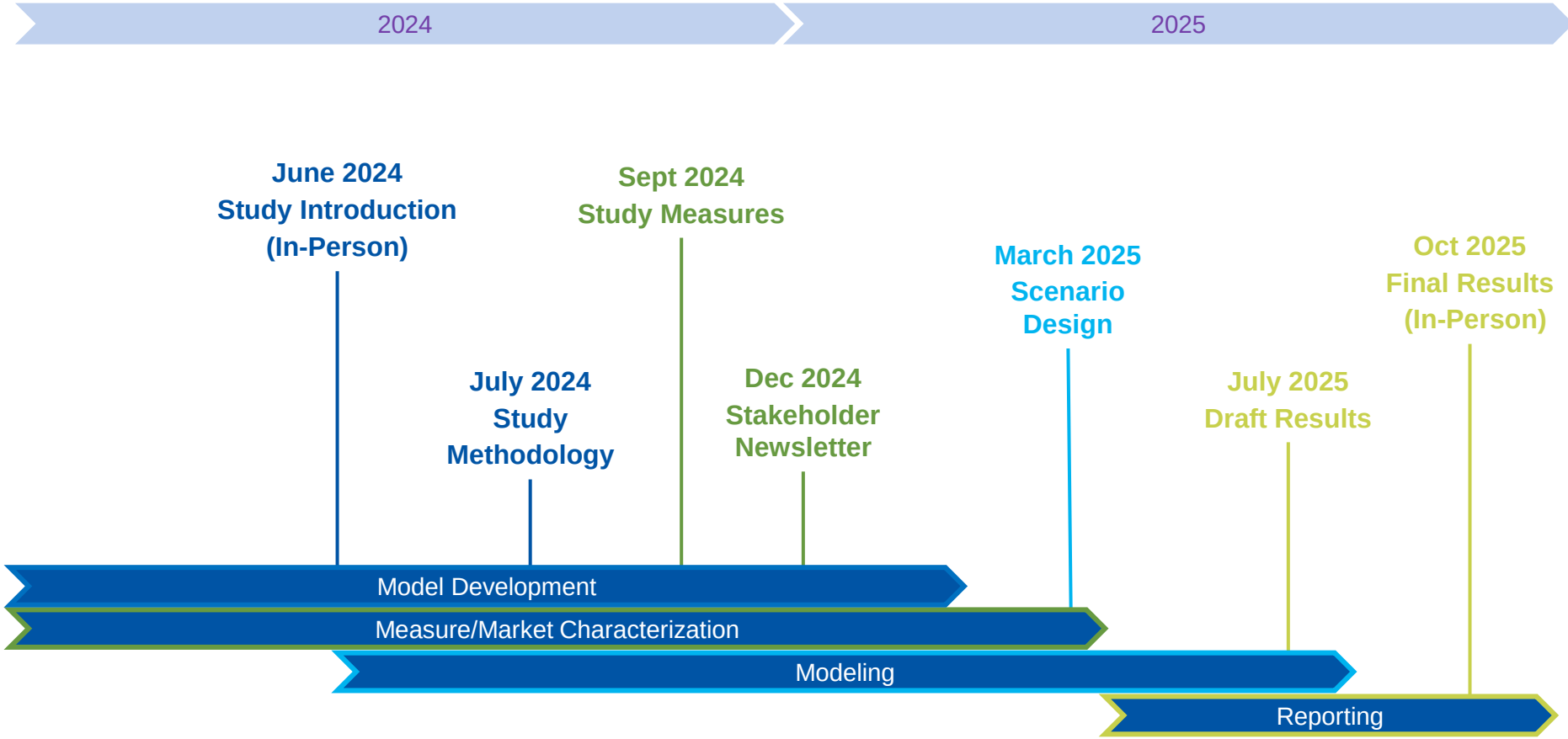
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Planning Study Timeline & Key Milestones



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Stakeholder Meetings



Additionally, the Evaluation Working Group, comprised of Wisconsin stakeholders with specific technical expertise, consulted throughout the study.

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Thank You and Discussion

Next Steps:

Cadmus to post meeting slides, notes, and recording to study website (focusonenergy.com/about/quad-v-planning-study)

Next Stakeholder Meeting:

Study Methodology (July)

Your input is important, please send us feedback

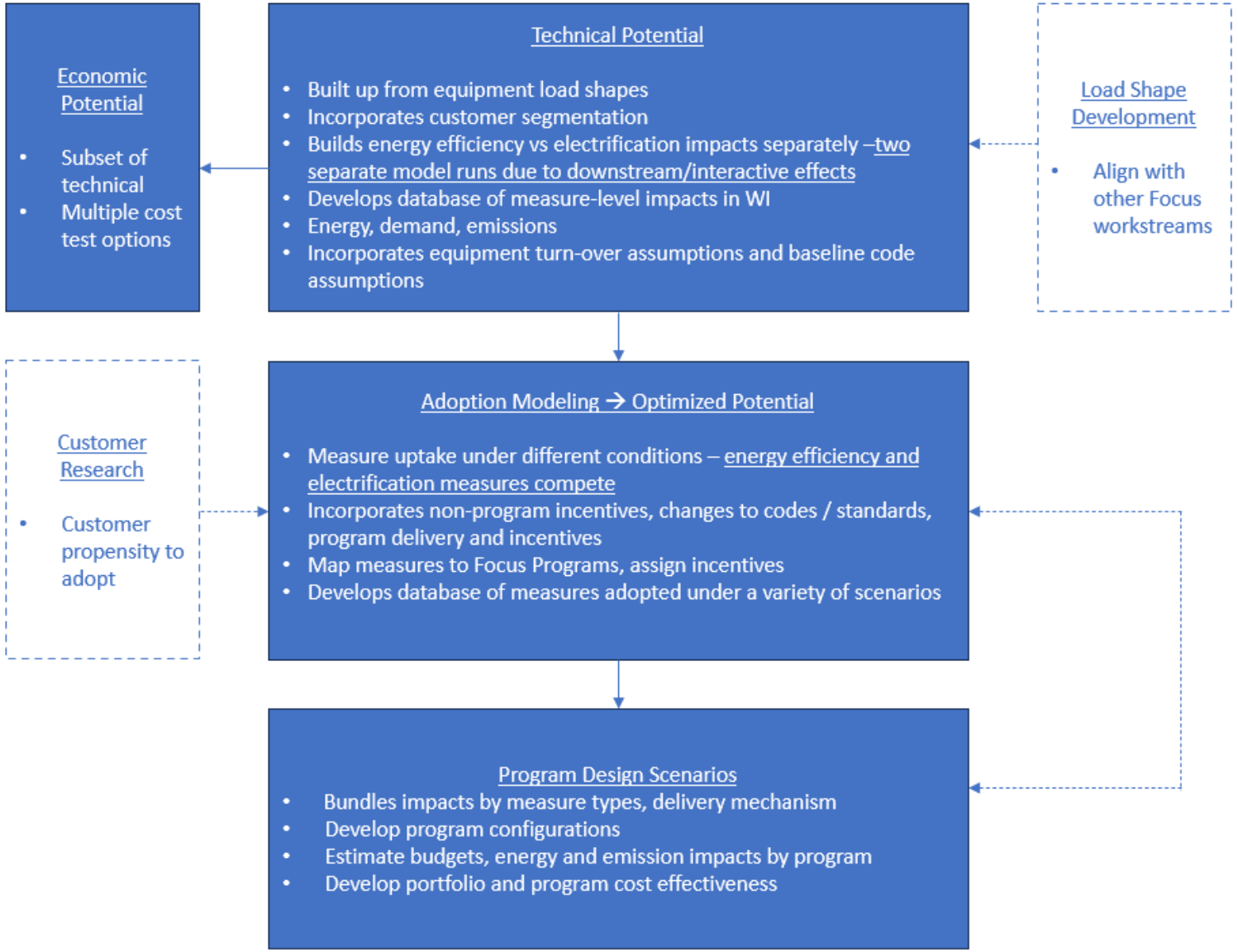
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Potential Modeling Approach



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