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focus on energy℠
Partnering with Wisconsin utilities



Planning Study Third Stakeholder Meeting

September 26, 2024

Agenda

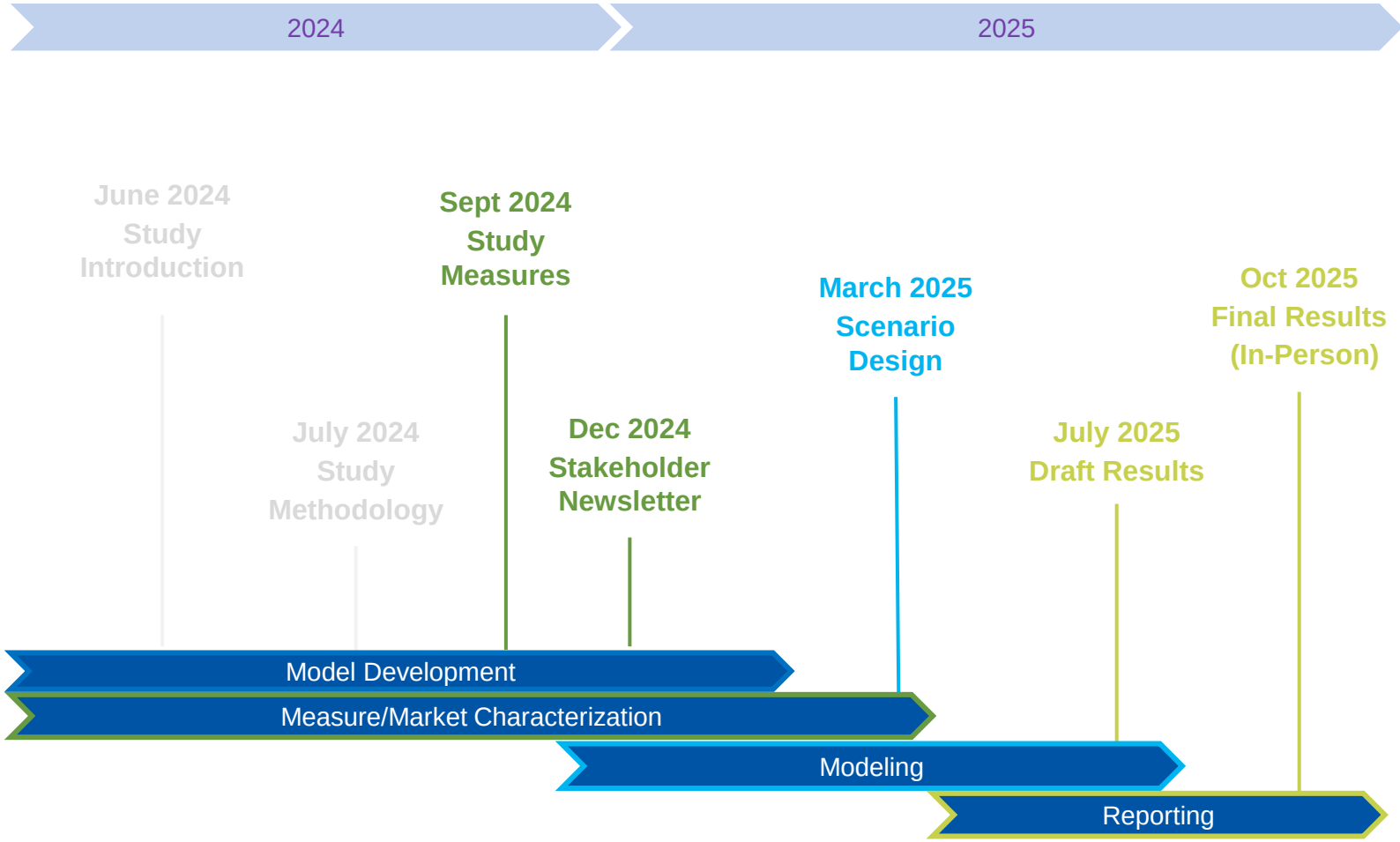
- Study Objectives and Timeline
- Historical Perspective and Gap Analysis
- Measure List Discussion
  - Residential
  - Commercial
  - Industrial
  - Agricultural
- Follow-Up & Next Steps

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Study Objectives and Timeline

Study objectives to understand:

- How focusing on **emissions reductions** could impact energy savings
- The value of / tradeoffs between focusing on **demand reduction** versus energy savings
- Potential energy, demand, and emission reductions in Wisconsin **across customer segments**, particularly for income-qualified households
- Options for and potential benefits of policy and programmatic changes that promote further **fuel switching**
- How the Inflation Reduction Act (**IRA**) could impact programmatic uptake for Focus on Energy programs and the best path to complement its implementation



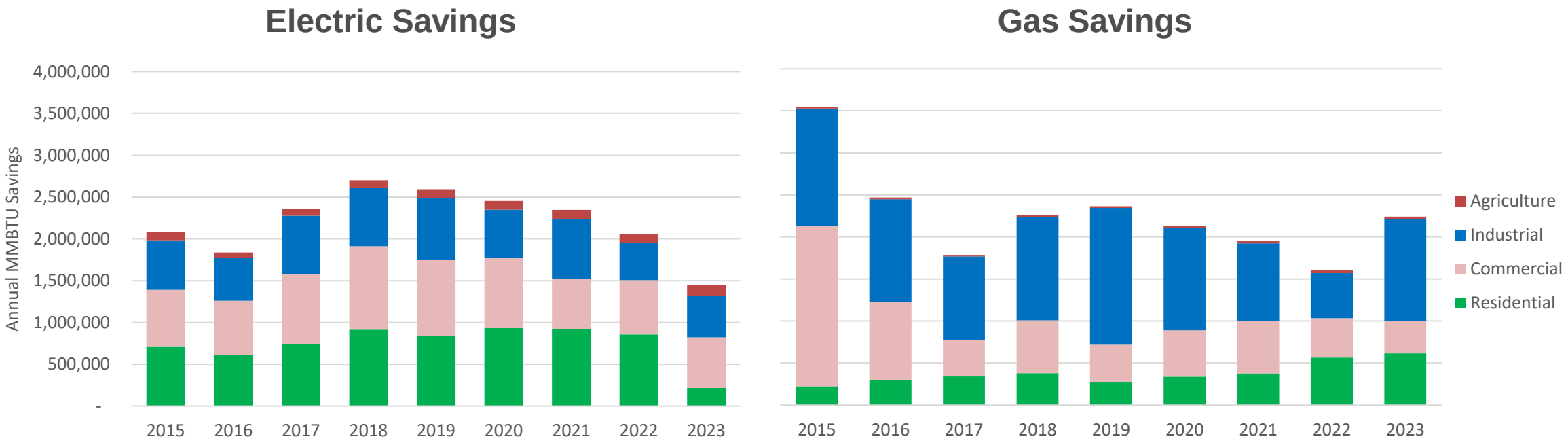
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Questions from Stakeholder Meeting 2

Questions / Comments	Response
What are key assumptions for electrification impacts? How can the stakeholders review those assumptions?	After measure selection Cadmus will characterize individual measures. Cadmus can share detailed measure characterization assumptions with interested parties.
How does Cadmus model electrification decisions? Use caution with electrification modeling assumptions. The average person in Wisconsin with a heat pump is not an average person.	Electrification decision modeling will be informed by market research conducted specifically for this study.
How does the study account for energy savings from building shell retrofits?	Energy impacts from building shell retrofits are accounted for in the building heating and cooling loads. When a heating or cooling system changes, so does the impact from building shell retrofits.
Will the study model the impacts from dual-fuel measures? These may be the highest use case going forward.	The study will include heat pumps with gas-back up. If there are other types of hybrid measures to include, please provide that feedback.
Will the study show maximum peak demand for scenarios?	The study will report average peak impacts across the Focus on Energy summer and winter peak periods.

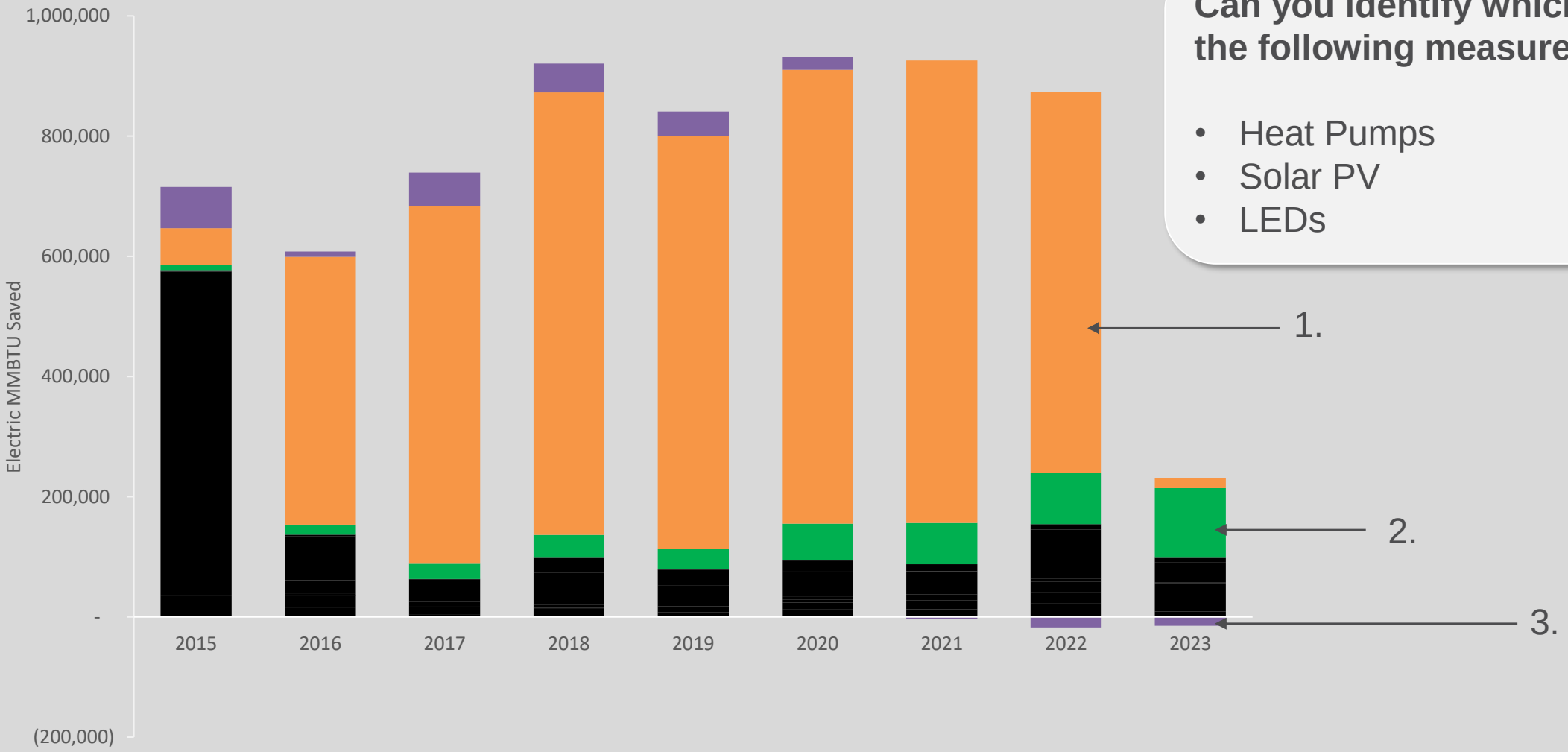
Historical Perspective – Cross Sector

- Past 4 years: industrial & residential gas; commercial electric primary program savings drivers
- Year-to-year variance on savings sources: 2022 industrial gas savings only 40% of 2023 industrial gas savings
- Residential: 2023 gas savings increased due to heat pumps, electric savings decreased due to lighting standards (decrease offset by solar PV ramp)
- Industrial: savings primarily from custom projects & energy recovery for gas, and LEDs and VSDs for electric
- Agriculture: small fraction of overall program savings primarily from LEDs, VSD, fans, and dryers



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Historical Focus on Energy Perspective – Residential Electric MMBTU

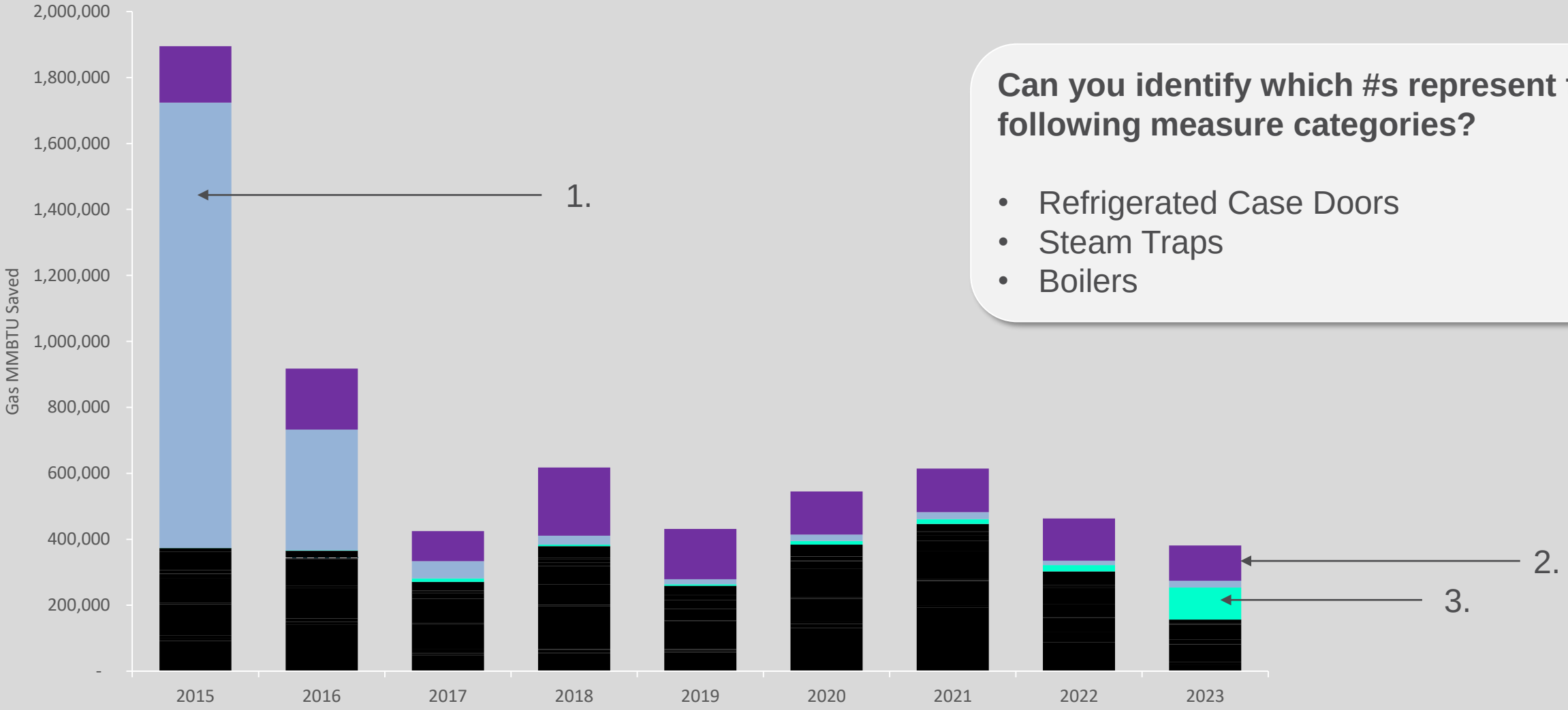


Can you identify which #s represent the following measure categories?

- Heat Pumps
- Solar PV
- LEDs

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Historical Perspective – Commercial Gas MMBTU

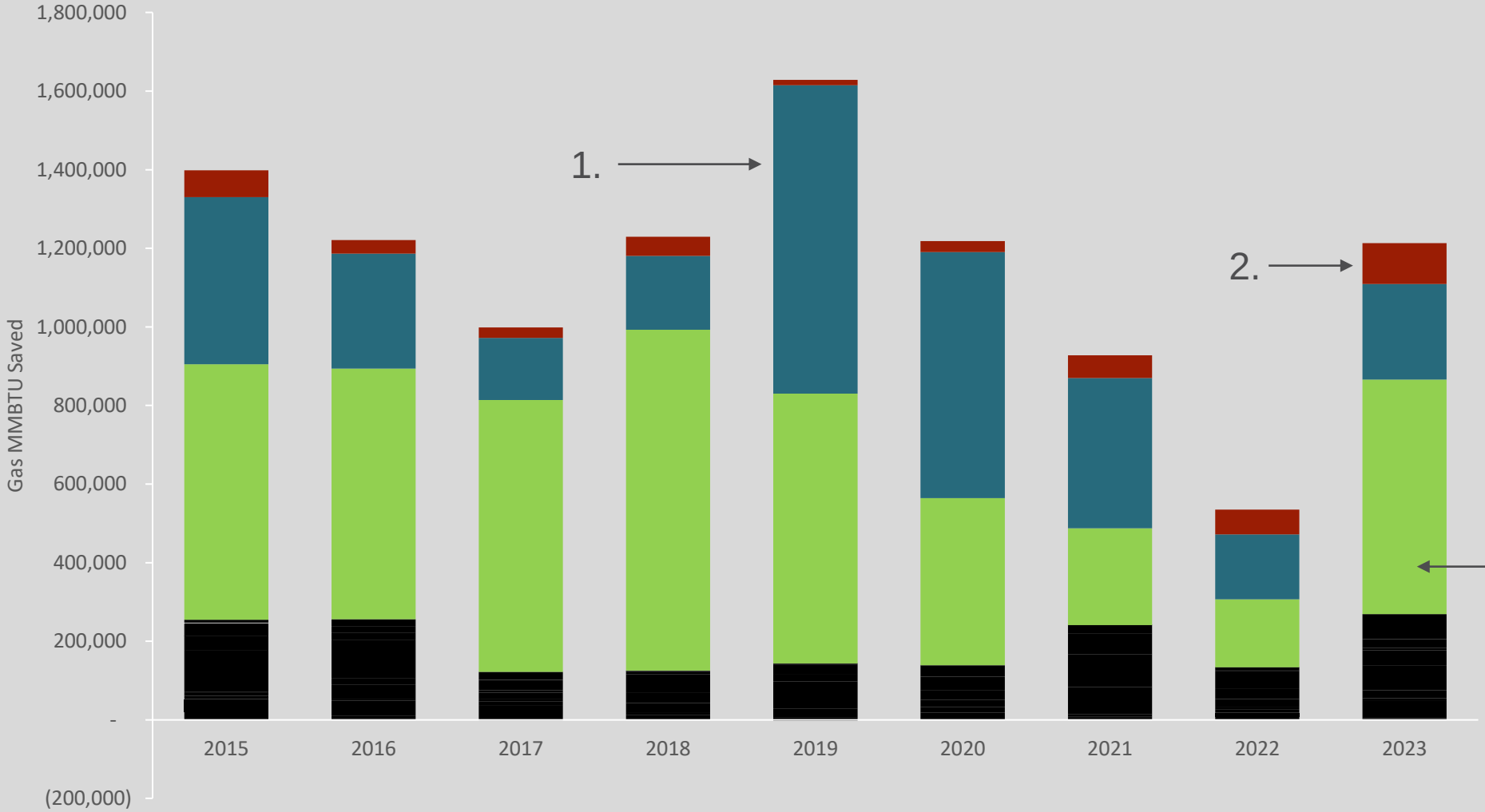


Can you identify which #s represent the following measure categories?

- Refrigerated Case Doors
- Steam Traps
- Boilers

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Historical Perspective – Industrial Gas MMBTU

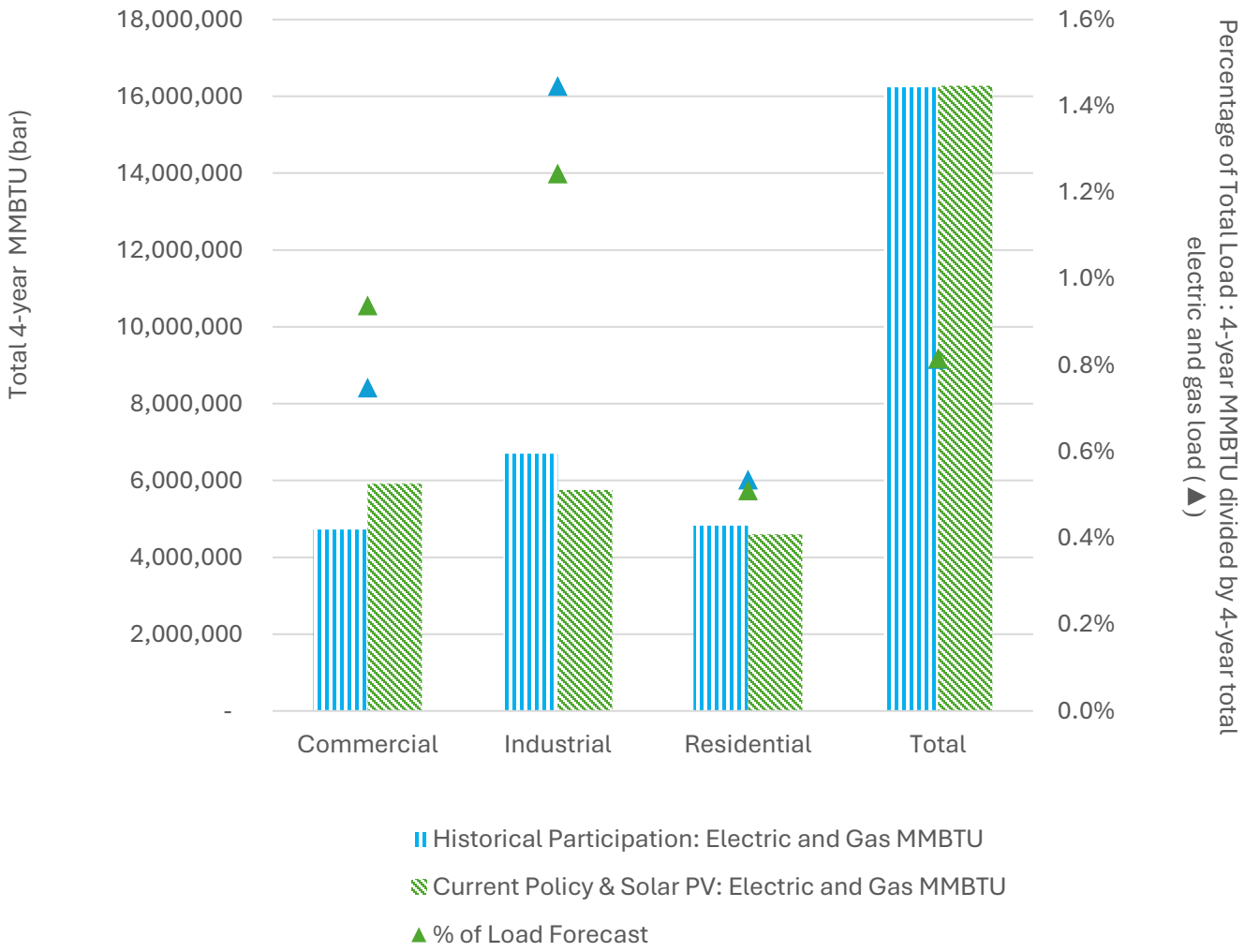


Can you identify which #s represent the following measure categories?

- Custom Projects
- Energy Recovery
- Filtration

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Gap Analysis Overview



4-year Historical Participation (2020-2023) compared to 4-year Current Policy Potential & Base Solar PV forecast* (2023-2026)

Cross Sector
Potential estimates match participation

Commercial
Potential study over-estimated participation

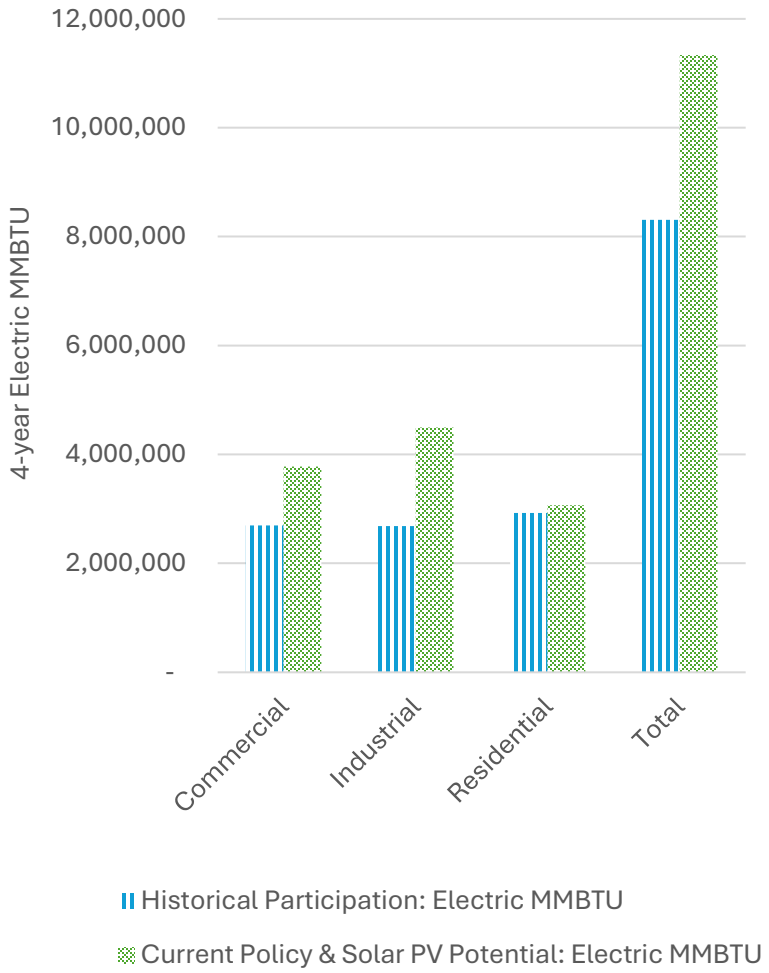
Industrial
Potential study under-estimated participation

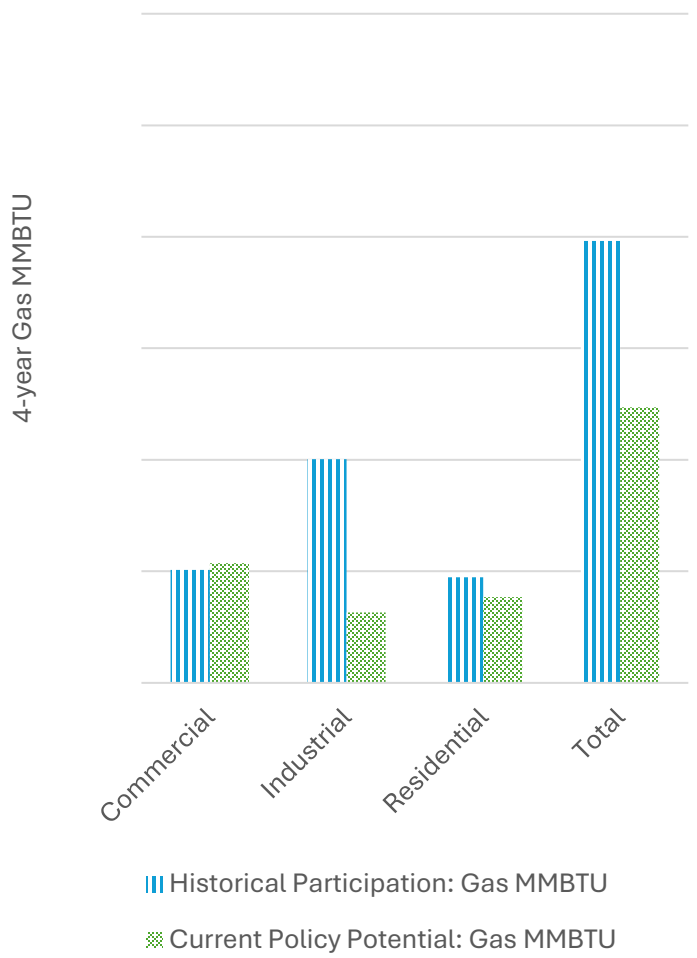
Residential
Potential study under-estimated participation

* 2021 Potential Study

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Gap Analysis Overview





Historical adoption = 2020-2023
Potential study = 2023-2026

Fuel Types

Industrial potential over-estimated electric and under-estimated gas participation significantly, causing gaps across fuels

End Uses

Biggest MMBTU gaps:

- Gas industrial processes under-estimated significantly in potential study: program approaches to generating savings very challenging to align with potential modeling
- Electric water heat: significant amount of savings in potential study aerators and showerheads compared with program savings. Potential study includes clothes washer and heat pump water heater, but these measures not present in program savings as individual measures

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Take Aways from Historical Data & Gap Analysis

- Study will develop program scenarios to address research questions associated with study objectives.
- Predicting future measure mix scenarios is challenging, given fluctuations in program delivery
- Considering measures that are likely to be included in future program designs provides flexibility for scenario development
- Including measures that are unlikely to be included in future programs should be reconsidered

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Draft Measure List Development

Approach for Draft Measure List Proposal

1. Categorized program measures based on measure names and descriptions and cross referenced with past potential study
2. Reviewed TRM to identify additional measures for program scenarios
3. Identified measures with electrification applications
4. Cross-referenced program measures with IRA offerings
5. Identified measures with demand shifting potential
6. Circulated draft measure list to study stakeholders

Where past potential study have focused on every possible measure, this planning study is targeted on program scenarios to analyze potential impacts of transitional program priorities.

Therefore, the number of study measures may decrease, leading to an overall reduction in technical and economic potential estimates.

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Discussion Questions & Next Steps

Questions

1. What are measures that are not on the draft list but have a high likelihood to gain prominence in the portfolio in the coming years? (**Data or research to support recommendation highly encouraged)**

2. Should any measures be removed from the list because they are unlikely to be part of a future Focus on Energy program design? (**Please provide reasoning and/or data**)

3. What is the necessary level measure specificity of conducting analysis and reporting results?
    1. As a measure category (such as grouping all residential efficient ducted air source heat pumps together)?
    2. By efficiency level (such as ENERGY STAR, advanced efficiency, and premium heat pumps)?

4. Should the study consider any measures to be offered only through specific programs, such as income qualified programs?

Next Steps

1. Finalize measure list and determine appropriate level of analysis: October 2024
2. Conduct measure characterization, including hourly load impacts: October 2024 – April 2025

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Residential Measures

End Use Category	4-Year Electric Technical Potential: 2021 Study (MMBTU)	PY19 to PY23 Electric Savings (MMBTU)	4-Year Gas Technical Potential: 2021 Study (MMBTU)	PY19 to PY23 Gas Savings (MMBTU)	Total Measure Categories	Measure Categories with Electrification Applications	Measure Categories with IRA Incentives	Measure Categories with Load Shifting Applications or Demand Reduction Potential
Appliance	3,227,607	929	86,927	-	5	2	1	2
Cooking	5,704	-	98,417	-	3	3	2	-
HVAC*	1,696,041	159,414	5,223,723	1,013,315	28	4	11	16
Water Heat	4,582,961	86,370	3,987,863	414,752	11	2	1	2
Lighting	246,491	146	-	-	2	-	-	-
Other	10,412	1,583	68,938	19,053	7	1	-	4
Plug Load	218,224	29,629	-	9,999	2	-	-	-

Notes:

- Draft measure list includes several measures with limited historical savings, but electrification applications
- Load shifting applications include water heater and electric vehicle charger management, as well as appliances with high demand savings potential
- Draft measure list includes a “Program Home” measure since New Homes program is a significant driver of savings

* Includes heat pumps with gas back-up

Commercial Measures

End Use Category	4-Year Electric Technical Potential: 2021 Study (MMBTU)	PY19 to PY23 Electric Savings (MMBTU)	4-Year Gas Technical Potential: 2021 Study (MMBTU)	PY19 to PY23 Gas Savings (MMBTU)	Total Measure Categories	Measure Categories with Electrification Applications	Measure Categories with Load Shifting Applications or Demand Reduction Potential
Air Compressor	21,005	12,541	-	-	6	-	2
Appliance	55,335	122	34,945	226	3	1	-
Cooking	38,929	157	222,904	12,922	10	9	-
Embedded Data Center	1,300	2,545	-	-	4	-	-
HVAC	1,822,218	234,781	5,827,785	1,146,643	54	6	17
HVAC and Lighting	2,435	7,015	-	19	1	-	-
Lighting	2,371,276	1,319,552	-	-	14	-	3
Other	909	598	3,972	-	7	1	1
Plug Load	21,006	-	-	-	1	-	-
Refrigeration	430,530	137,207	-	142,319	14	-	-
Water Heat	323,230	505	135,941	25,016	7	3	-

Notes:

- Draft measure list includes HVAC measures with load reduction potential and load shifting applications (such as air compressor and electric vehicle charging load shifting)
- Draft measure list includes new “Custom Project” measures across end uses to align with program implementation

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Industrial Measures

End Use Category	Total Measure Categories	Measure Categories with Electrification Applications	Measure Categories with Load Shifting Applications or Demand Reduction Potential
Boilers & Burners	4	-	-
Compressed Air, Vacuum Pumps	12	-	1
HVAC	18	-	1
Lighting	5	-	-
Motor	6	-	-
New Construction	1	-	-
Other	2	-	-
Process	22	10	-
Refrigeration	3	-	-
Renewable Energy	1	-	-
Streetlighting	1	-	-

Notes:

- Industrial measures are highly customized, draft measure list includes several broader customer measure categories
- Electrification opportunities focused on industrial processes through measures such as electric arc furnaces or electric infrared heaters that Focus has not previously offered

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Agricultural Measures

End Use Category	4-Year Electric Technical Potential: 2021 Study (MMBTU)	PY19 to PY23 Electric Savings (MMBTU)	4-Year Gas Technical Potential: 2021 Study (MMBTU)	PY19 to PY23 Gas Savings (MMBTU)	Total Measure Categories	Measure Categories with Electrification Applications
Dairy	39,493	60,341	-	-	4	-
HVAC	105,771	17,242	2,761	5,703	11	2
Irrigation	2,704	33,186	-	-	3	-
Lighting	64,223	167,806	-	-	5	-
Other	5,808	8,076	76,873	80,271	7	1
Water Heat	-	-	12,783	-	2	2

Notes:

- Draft measure list includes several custom projects to reflect opportunities to pursue individualized approaches
- Agricultural electrification potential focused on HVAC, Grain Heaters, and Water Heat

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Thank You and Discussion



Next Steps:

- Post meeting materials & and current draft measure list to study website
- Stakeholders please provide written feedback by October 3
- Post final measure list to study website by October 17

Next Stakeholder Meeting Meeting:

- March 2025: Scenario Design
- Interim Newsletter: December 2024

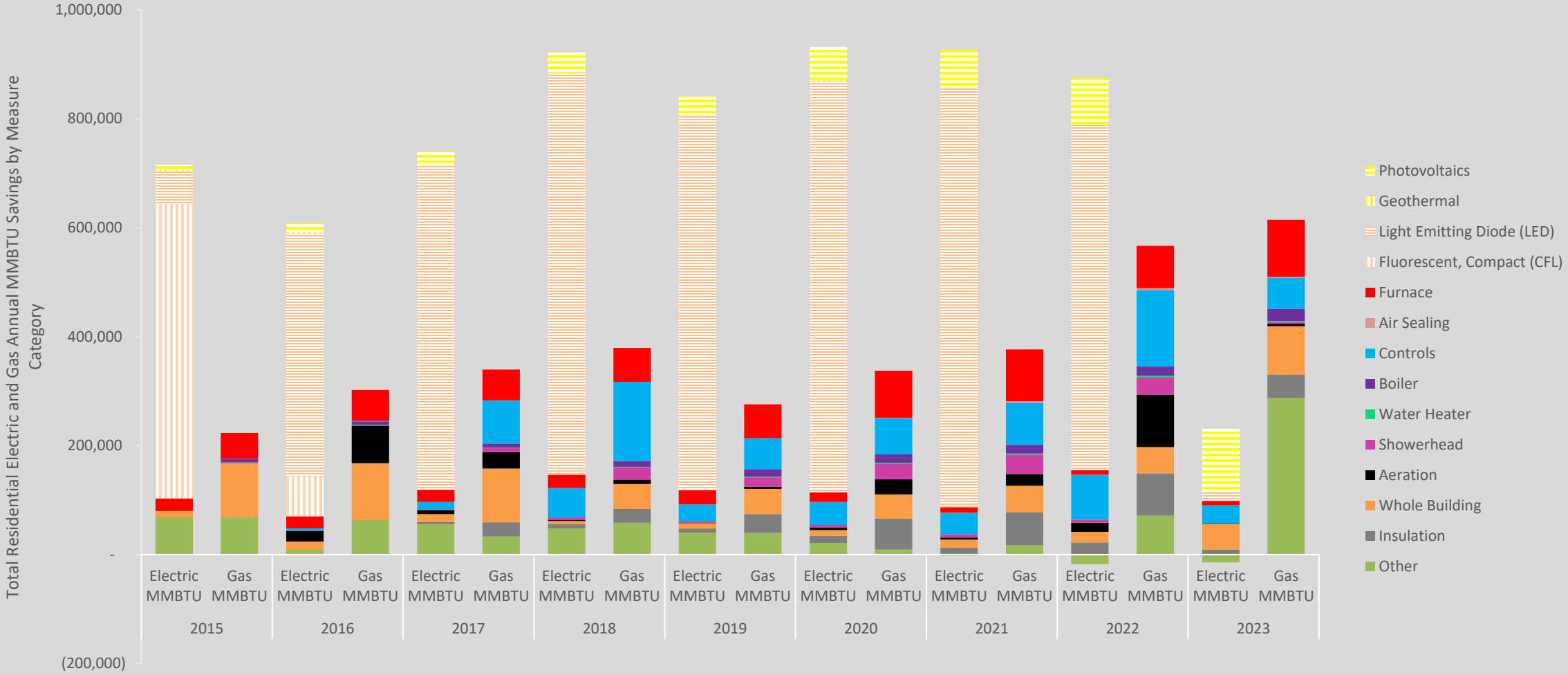
Your input is important, please send us feedback:

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Appendix: Historical Savings by Measure Group

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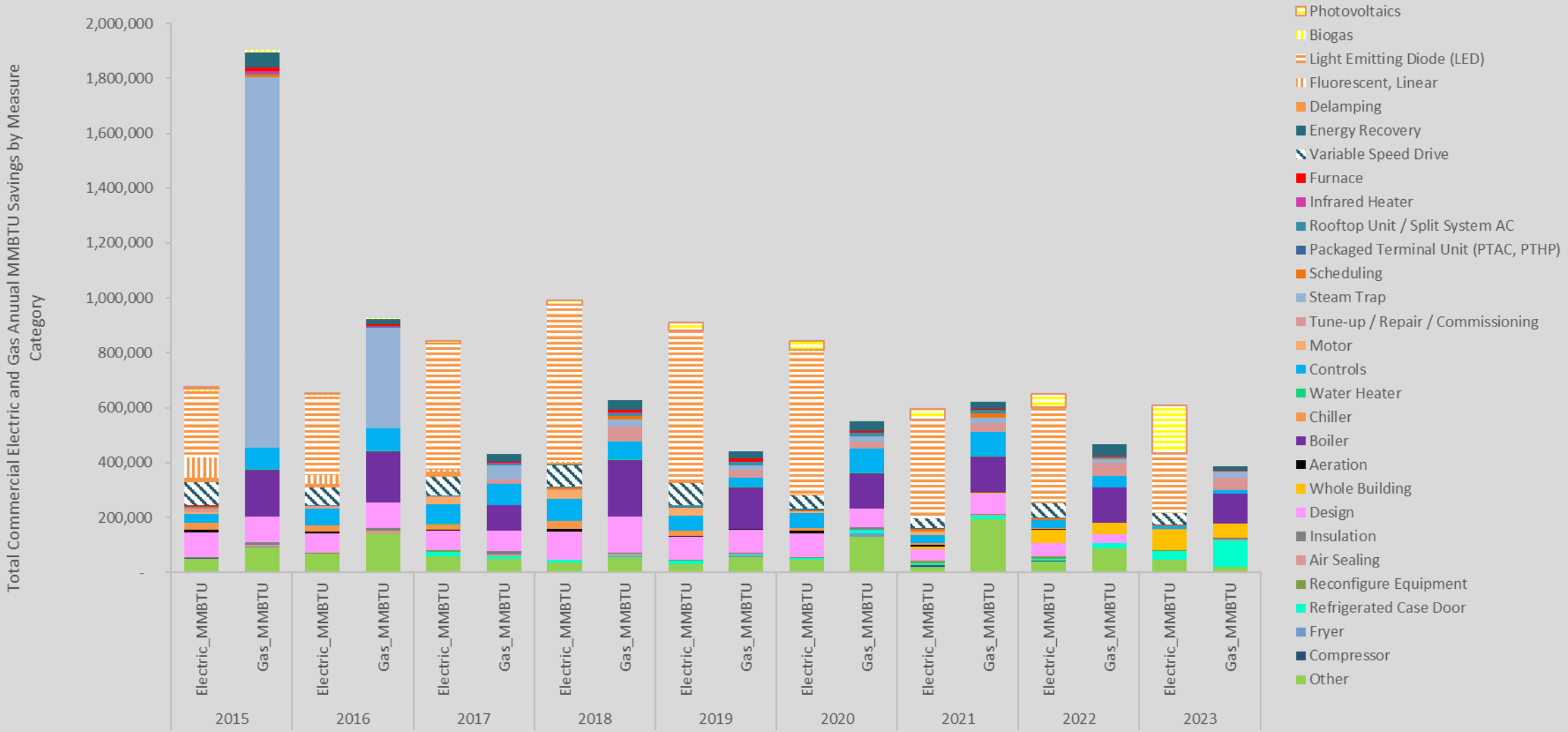
Historical Perspective – Residential



43% of 2023 “Other” savings = Heat Pumps

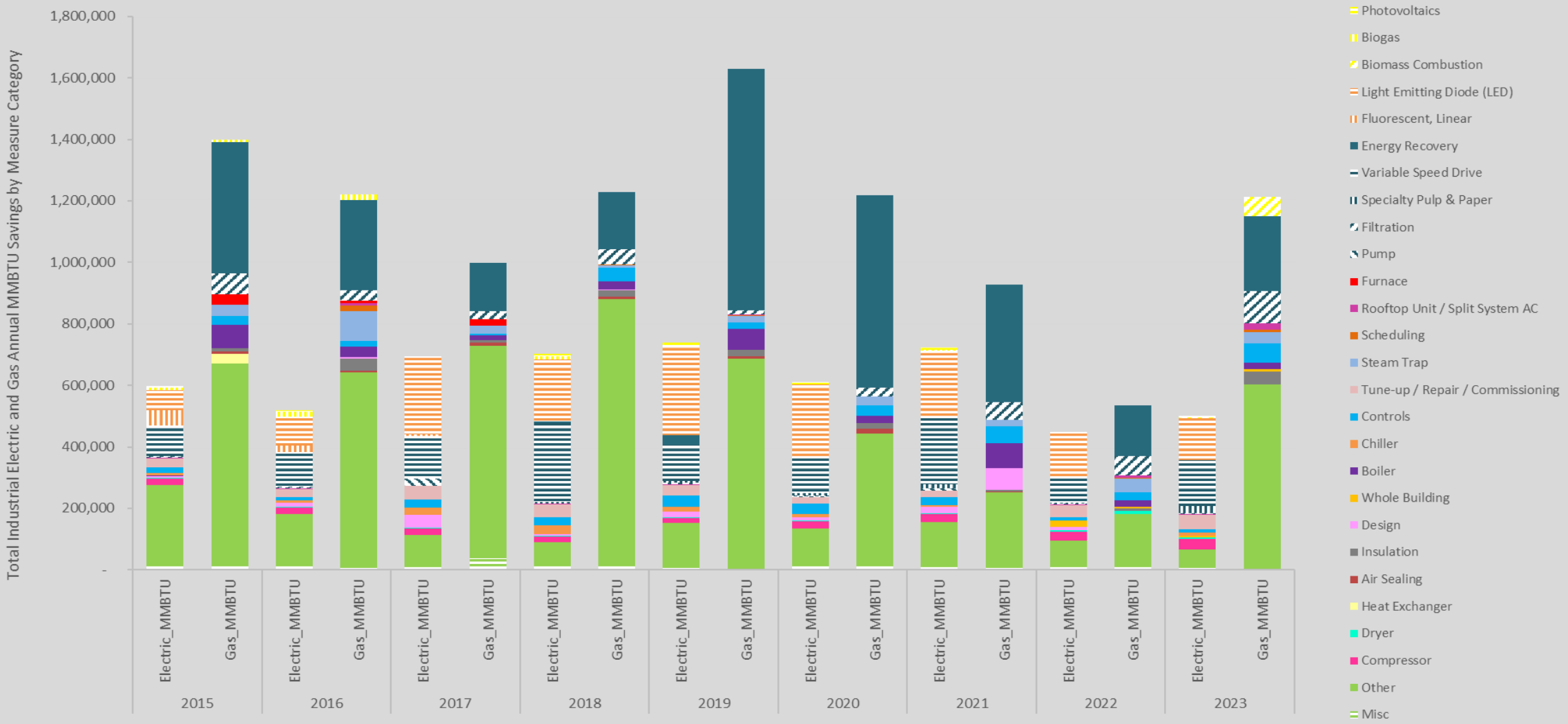
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Historical Perspective – Commercial



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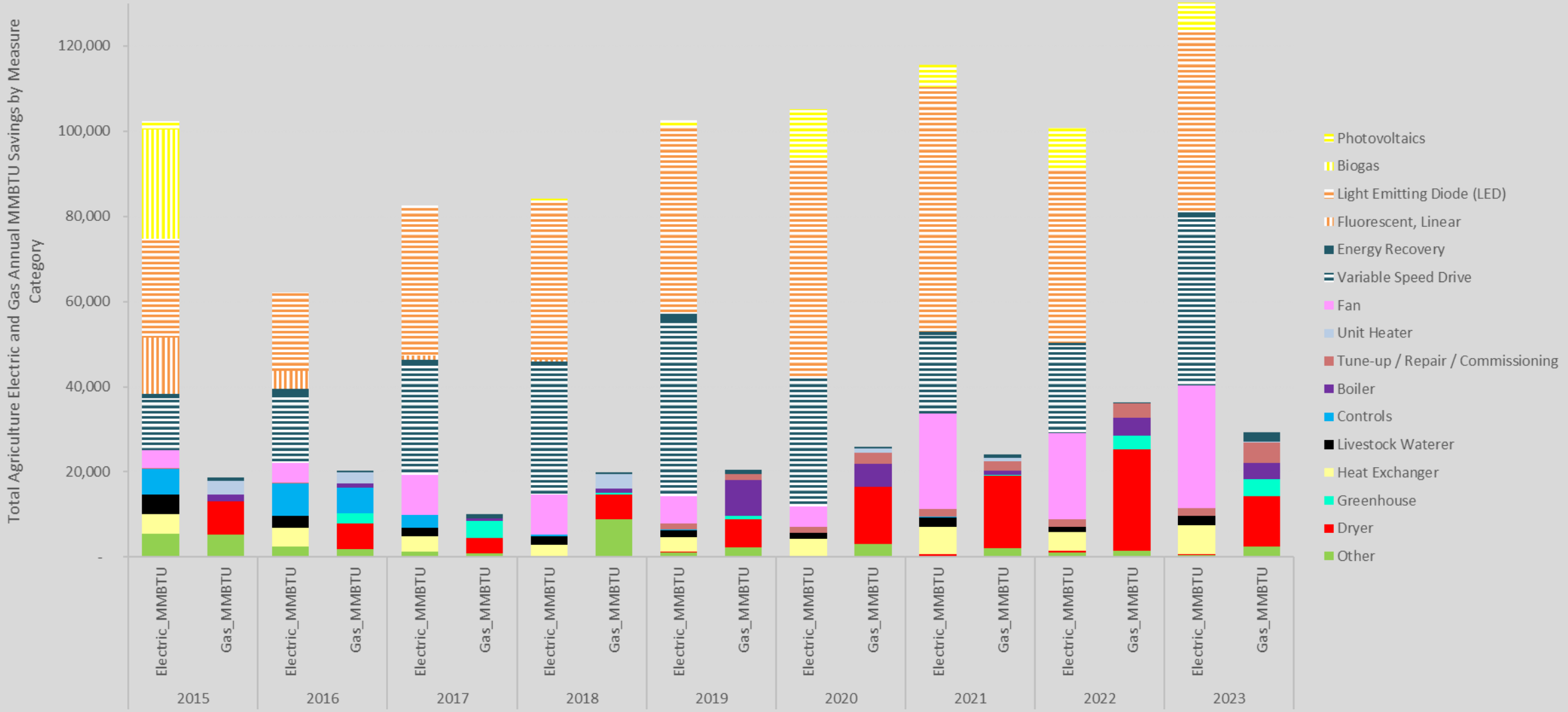
Historical Perspective – Industrial



Note: 80% “Other” industrial measure category total MMBTU savings are from the custom industrial process measure.

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Historical Perspective – Agriculture



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