Welcome!

Supporting Organizations, Groups and Individuals

Ahlstrom-Munksjo	DNV GL	Madison Gas & Electric	WE Energies
Alliant Energy	EFI	Manitowoc Public Utilities	WEC Energy Group
ACEEE	Evergreen Economics	Municipal Electric Utilities of Wisconsin	Wildan
APTIM	Franklin Energy	Nexant	Wisconsin Association of School Boards
Cadmus	Green Bay Area Public School District	Northwest Wisconsin Electric Company	Wisconsin Association of School Business Officials
CESA 10	H&H Group Holdings	PSD	Wisconsin Electric Cooperative Association
Citizens Utility Board	ICF International	Public Service Commission	Wisconsin Industrial Energy Group
City of Two Rivers	Illume Advising	RENEW Wisconsin	Wisconsin Manufacturers and Commerce
Clean Wisconsin	James A. Buchen Public Affairs, LLC	Slipstream	Wisconsin Paper Council
CLEAResult	Kenosha Unified School District	St. Croix Gas	WPPI
Dane County	La Crosse School District	Superior Water, Light & Power	Xcel Energy
Department of Administration	Leidos	Tetra Tech	WISCAP

CADMUS

Webinar Logistics & Guidelines

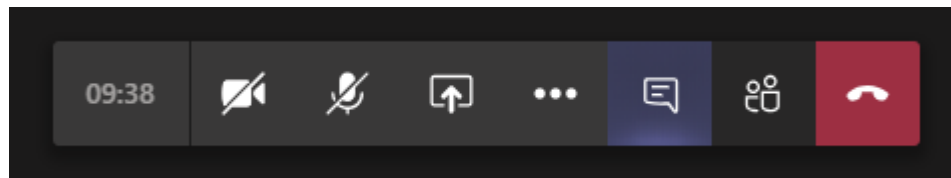All parties except presenter muted to avoid unnecessary noise distraction

If you have an immediate question, or audio or video is poor please send an instant message to the moderator

We will stop today's presentation several times to take questions

Your Settings

CADMUS

Focus Today: Why Are We Here?

2015-18 Quad Period was a success

High Cost-Effectiveness

Large economic impact to the state

It's the right time to talk about how to sustain it
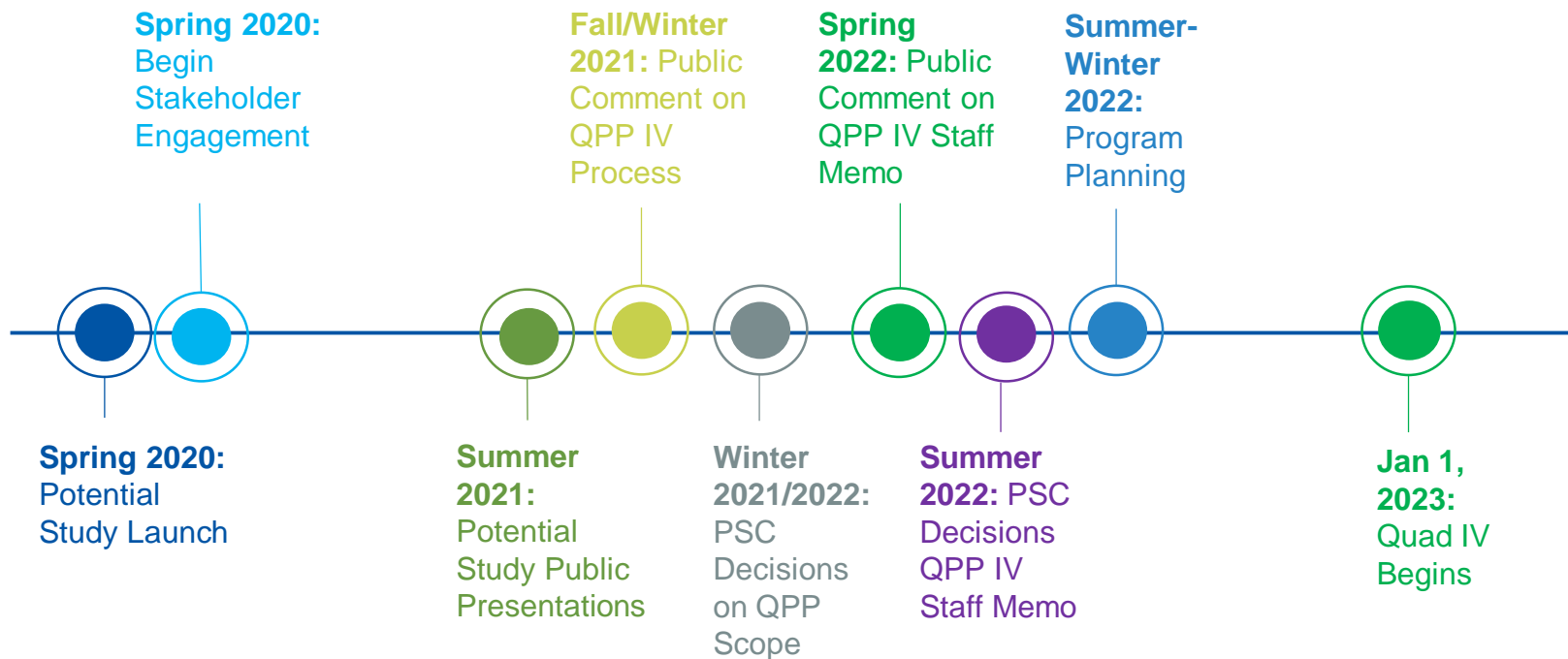
Market is changing: LEDs, new programs

New portfolio design

Next Quad Plan coming up!

Potential Study Integration With Program Planning

Potential Study and Stakeholder Engagement 1st Step in multi-year Quadrennial IV Planning Process (QPP IV)

Spring 2020: Begin Stakeholder Engagement

Fall/Winter 2021: Public Comment on QPP IV Process

Spring 2022: Public Comment on QPP IV Staff Memo

Summer-Winter 2022: Program Planning

Spring 2020: Potential Study Launch

Summer 2021: Potential Study Public Presentations

Winter 2021/2022: PSC Decisions on QPP Scope

Summer 2022: PSC Decisions QPP IV Staff Memo

Jan 1, 2023: Quad IV Begins

Cadmus Potential Study Management Team

Steve Cofer
Principal Investigator

Lakin Garth
Modeling Lead

Jeremy Eckstein
Project Manager

Aquila Velonis
Engineering Lead

Amalia Hicks
Evaluation Lead

CADMUS

Agenda

1 **Stakeholder Meetings**
- Objectives of Stakeholder Engagement
- Future Meetings

2 **2020 Potential Study Objectives**
- Integration with Portfolio Planning
- Types of Energy Efficiency Potential Estimated
- 2017 Findings

3 **2020 Potential Study Methodology**
- Technical Potential
- Economic Potential
- Achievable Potential

4 **2020 Milestone Activities**
- Customer Segmentation
- Primary Data Collection
- Measure Characterization
- Potential Modeling
- Reporting

5 **Q & A**

CADMUS

1. Stakeholder Meetings

CADMUS

Stakeholder Engagement Objectives

1 — **Solicit Feedback**

- Several stakeholder meetings planned
- Provide data, resource material, and insight to enhance the potential study
- Opportunity to comment on results and draft report

2 — **Capture Stakeholder Perspectives**

- Focus on Energy reaches and impacts a diverse group and we wish to capture a broad perspective
- Particularly those perspectives that can inform estimate of potential or improve data collection

3 — **Create a Foundation for Broader Conversation**

- Opportunity for mutual learning
- Shared framework of collaboration
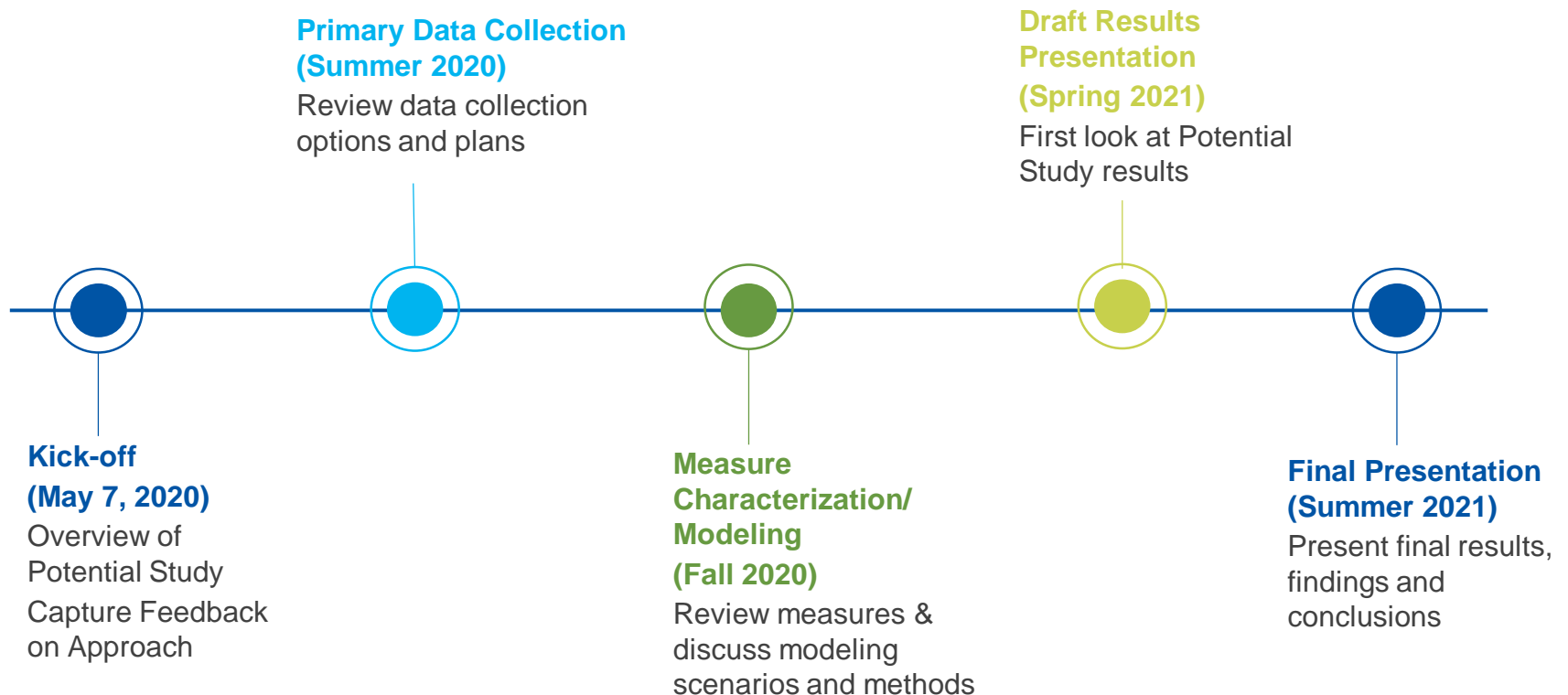
Cadmus will:

- Share key information (measure lists, data collection plans, draft reports)
- Provide specific questions to prompt feedback (stakeholders not limited to these) … please provide feedback within 14 days of receiving materials or meetings
- Summarize feedback at stakeholder meetings and provide a response
- Post all presentations and any relevant documents and materials in a manner that stakeholders can easily access. A follow-up email will be distributed with more instructions

CADMUS

Future Stakeholder Meetings

Proposed meetings timed to present key data and discuss next steps

Additional meetings can be scheduled as needed

Primary Data Collection (Summer 2020)
Review data collection options and plans

Draft Results Presentation (Spring 2021)
First look at Potential Study results

Kick-off (May 7, 2020)
Overview of Potential Study Capture Feedback on Approach

Measure Characterization/ Modeling (Fall 2020)
Review measures & discuss modeling scenarios and methods

Final Presentation (Summer 2021)
Present final results, findings and conclusions

CADMUS

Potential Study Objectives

CADMUS

Purpose of Energy Efficiency Potential Studies

Objective

Quantify total energy efficiency potential & specific measure and market opportunities available in Focus over the study period

CADMUS

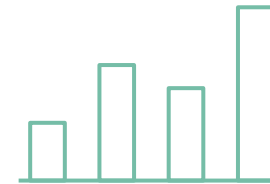# Potential Study Objectives

Achievable Potential Scenarios

12-Year Study Horizon (2023 – 2034) with focus on Quad IV

Core scenario

Business-as-usual funding

Commission-approved inputs

Sensitivity analysis, e.g.

Discount rates

Avoided cost forecasts

Avoided carbon prices

Funding levels

CADMUS

The Floor is Open – Feedback Welcome!

Questions/Comments?

- Stakeholder meetings & objectives

- Potential study objectives
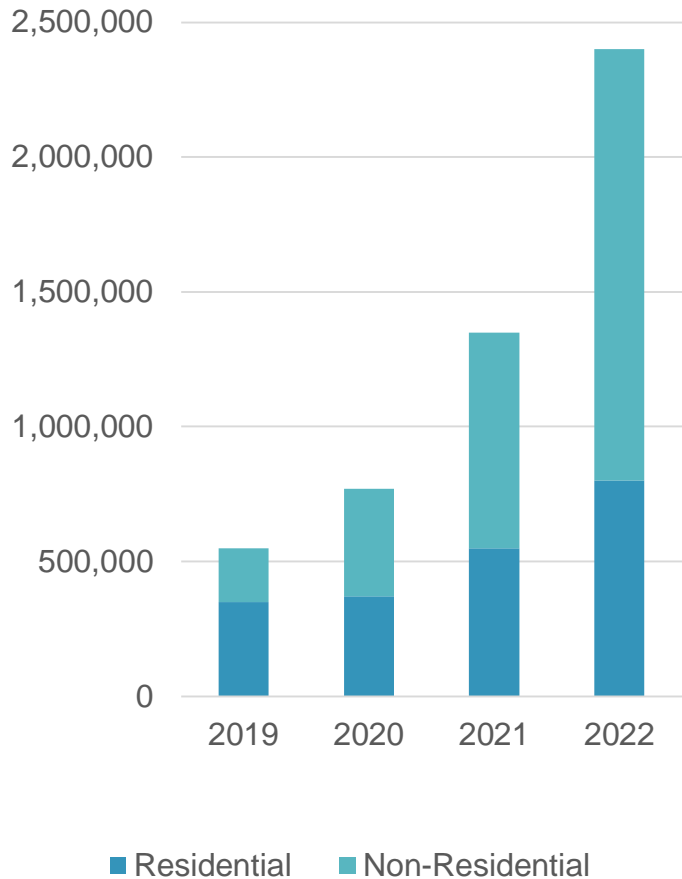
- Modeling scenarios

- Other questions?
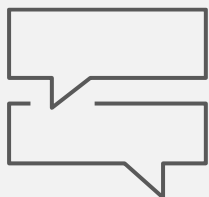
Please add your questions to the meeting chat: we will address questions in the order that they are received & provide opportunity for clarification.
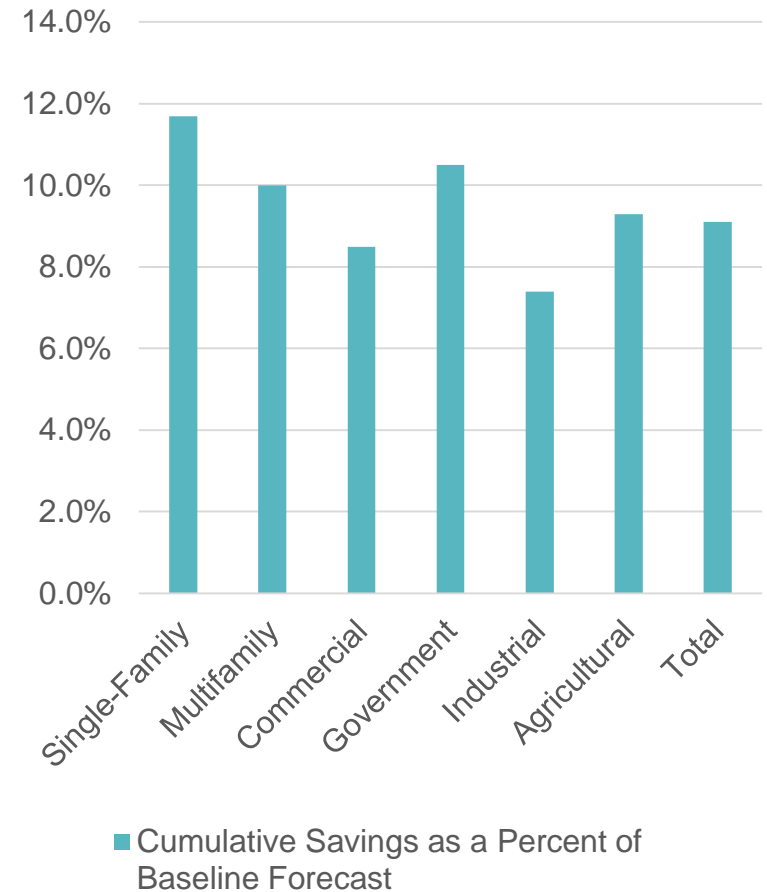
Please remain muted until your question is announced.

CADMUS

2017 Findings: Electric
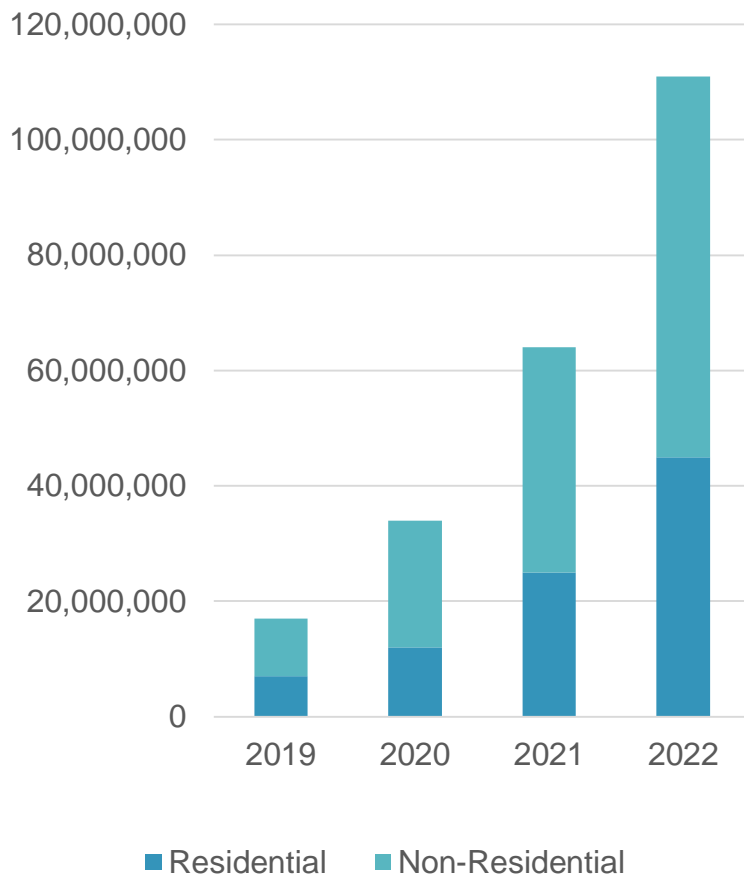
Cumulative Achievable (BAU): MWh

Legend: ■ Residential ■ Non-Residential

12-Year Cumulative Savings (BAU)

Legend: ■ Cumulative Savings as a Percent of Baseline Forecast

CADMUS

2017 Findings: Natural Gas

Cumulative Achievable: Therms

Legend: ■ Residential ■ Non-Residential

12-Year Cumulative Savings (BAU)

Legend: ■ Cumulative Savings as a Percent of Baseline Forecast

CADMUS
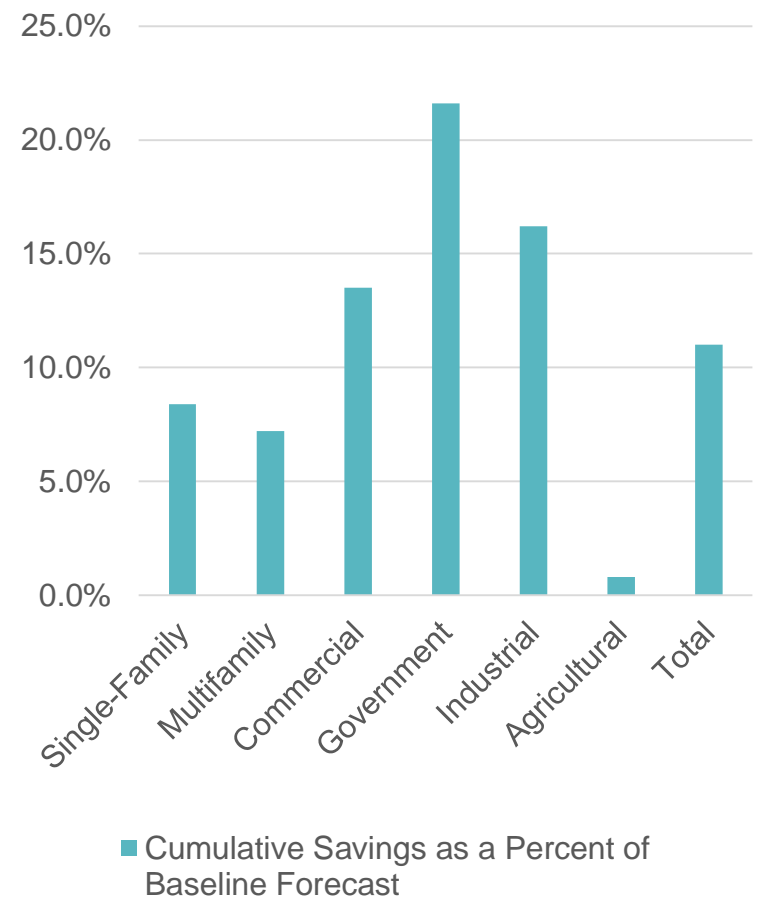
3. Potential Study Methodology

CADMUS

Types of Potential Estimated

| Not Technically Feasible	Technical Potential — **Theoretical maximum** energy can displaced by efficiency		
Not Technically Feasible	Not Cost-Effective	Economic Potential — **Economically cost-effective** compared to supply side alternatives	
Not Technically Feasible	Not Cost-Effective	Market Barriers	Achievable Potential — Accounts for **real-world barriers and non-measure costs of delivering programs**

Potential Study does not provide program targets

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

CADMUS

Achievable Potential

- Develop maximum measure adoption scenarios through survey research
- Scenarios based on % of incremental measure cost covered by incentive

- Apply maximum % adoption scenarios to economic potential
  - Practical scenarios: 25% and 50% incentives
  - Atypical scenarios: 75% and 100% incentives

Legend: ■ 25% (Base) ■ 50% (Moderate) ■ 75% (High) ■ 100% (Max)

CADMUS
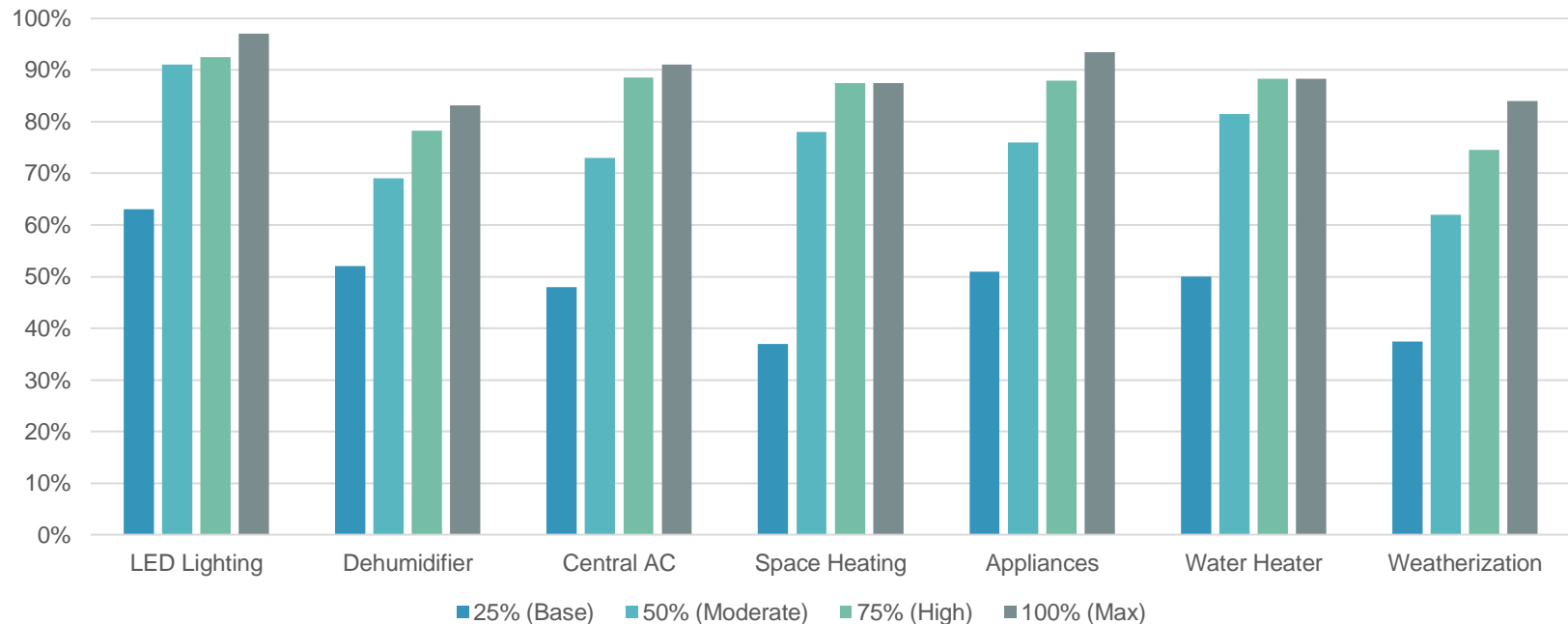
Achievable Potential

- Develop ramp rates based on historical data
- Match ramp rates to measure types
- Apply custom measure-specific ramp rates to maximum adoption scenarios

Legend: Residential LED Lighting — 6 Years to 100% — 8 Years to 100% — 100% at End — 60% at End

CADMUS
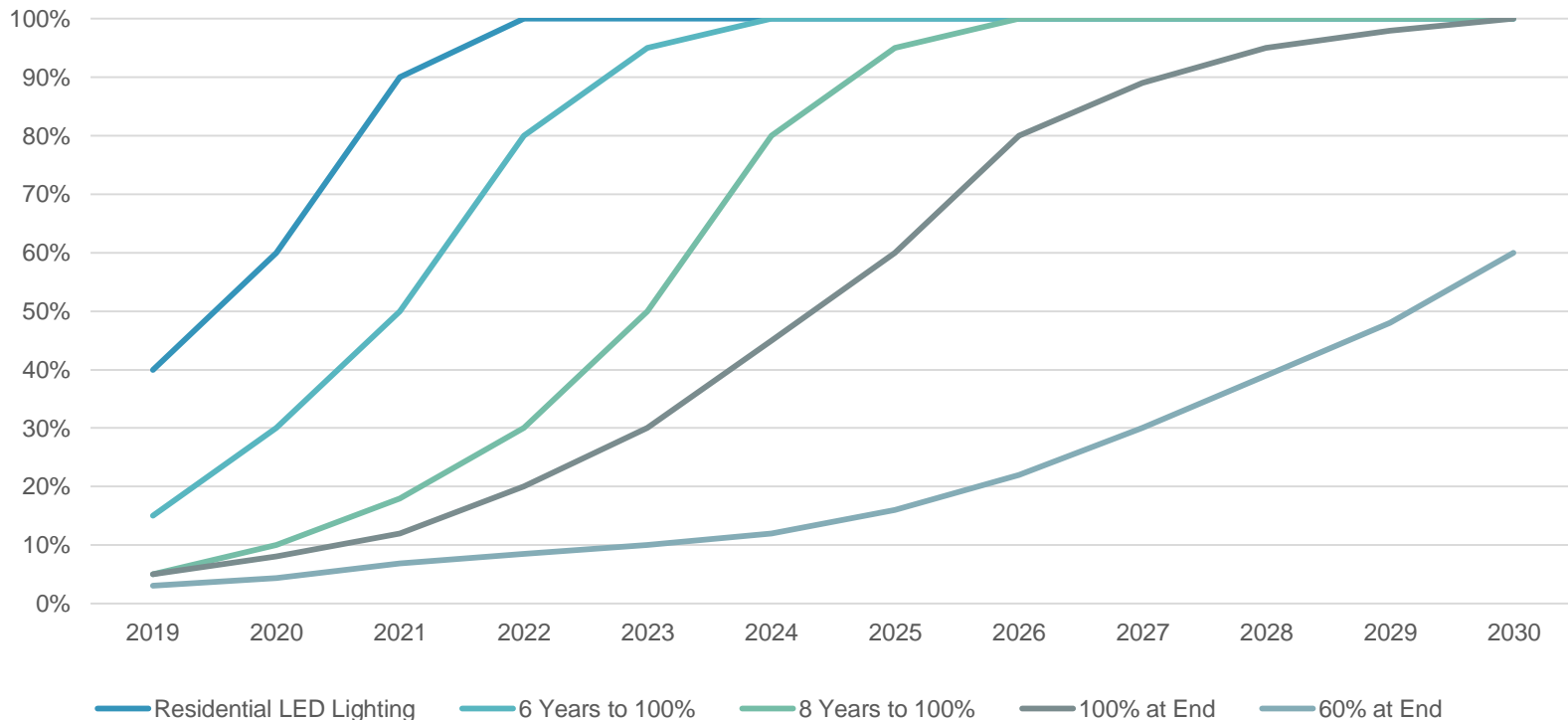
Changes in Avoided Costs

- Primary benefit in cost effectiveness tests

- Value has declined → avoided energy costs declining up to 30%

- Currently three avoided costs are calculated:
  - Electric Energy
 - Electric Generation Capacity
  - Natural Gas
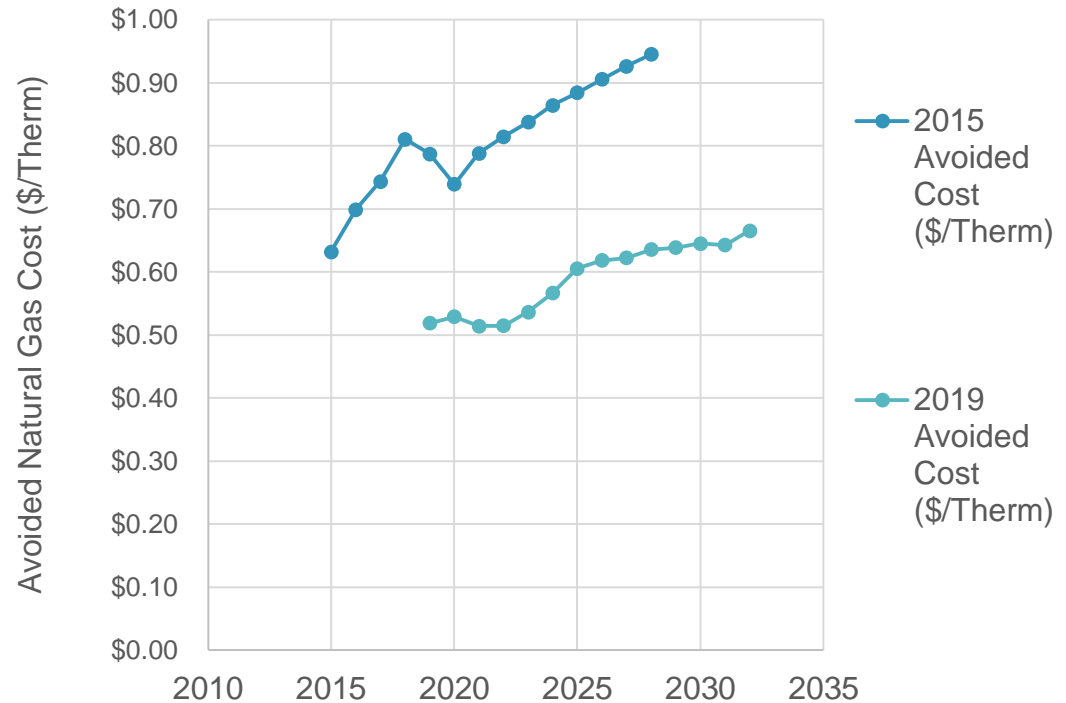
Cost Effectiveness (specifically, the Modified Total Resource Cost test as the primary test for Focus on Energy) is defined as:

$$TRC = \frac{[\textbf{\textit{Value of Gross Saved Energy}} + \textit{Value of Gross Avoided Emissions}] \times NTG}{[\textit{Administrative Costs} + \textit{Delivery Costs} + (\textit{Incremental Measure Cost} \times NTG)]}$$

Where $\quad$ ***Value of Gross Saved Energy*** $= \textit{Gross Savings} \times$ ***Utility Avoided Costs***

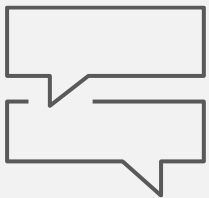# Avoided Cost Impact to Last Potential Study
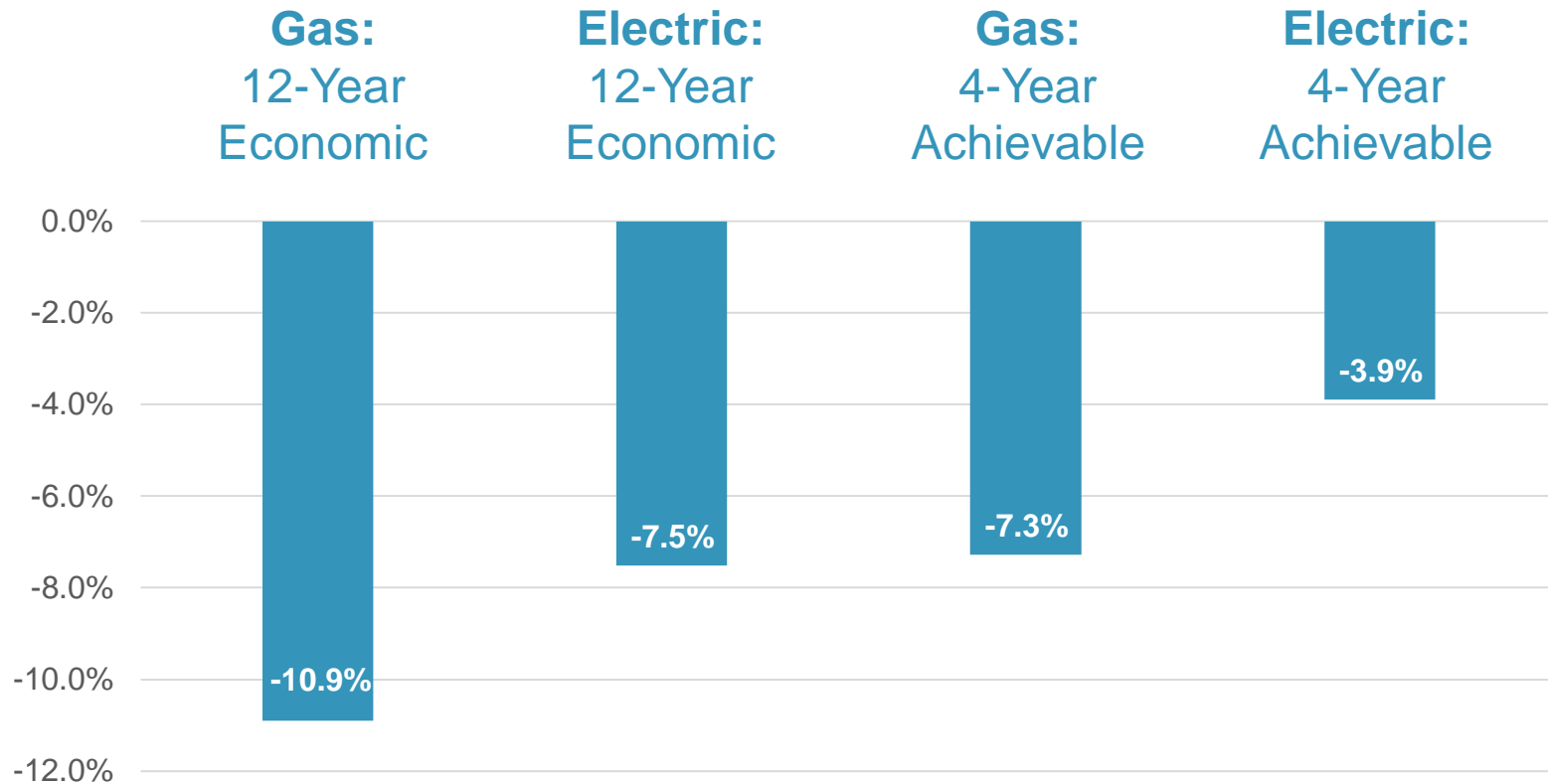
Avoided costs changes affect economic and, by extension, achievable potential.

CADMUS

The Floor is Open – Feedback Welcome!

Questions/Comments?

- Previous study results
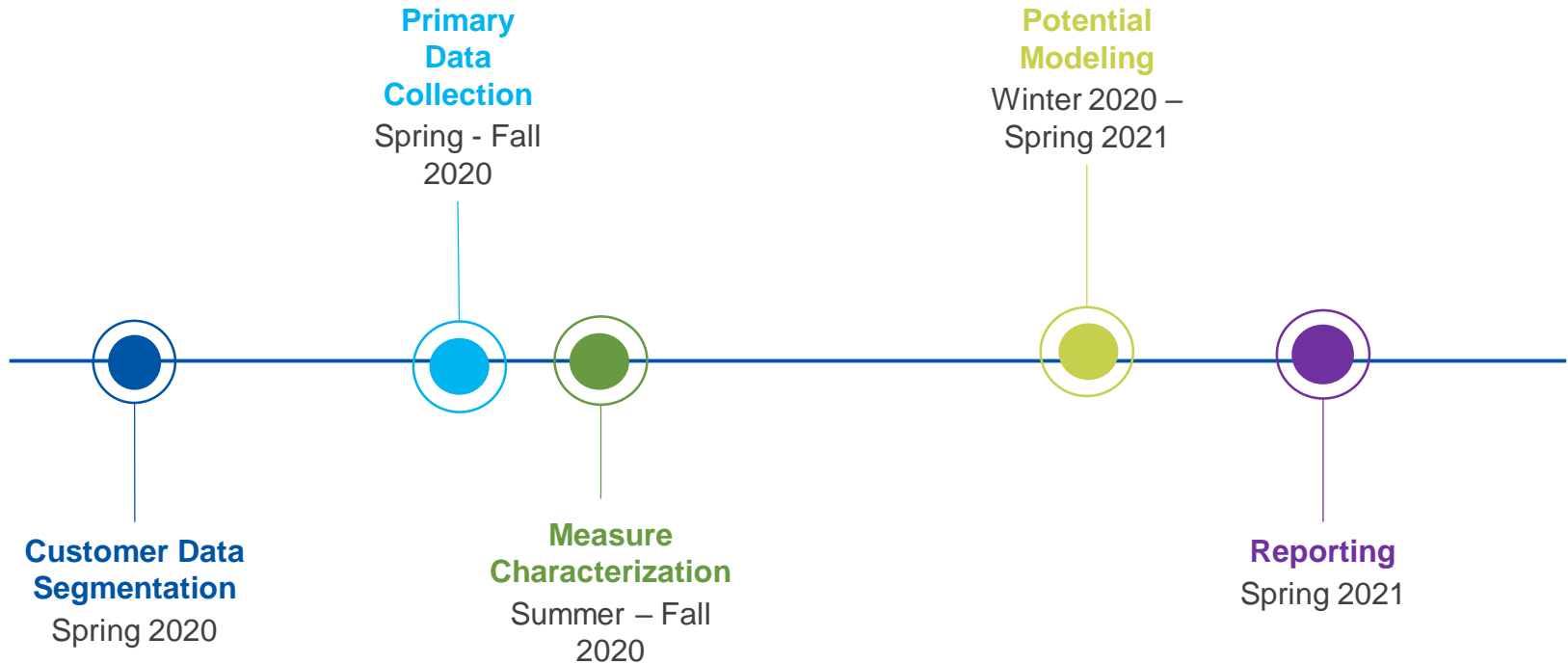
- Potential study methods

- Other questions?

Please add your questions to the meeting chat: we will address questions in the order that they are received & provide opportunity for clarification.

Please remain muted until your question is announced.

CADMUS

4. Milestone Activities

Milestone Activities Timeline

Primary Data Collection
Spring - Fall 2020

Potential Modeling
Winter 2020 – Spring 2021

Customer Data Segmentation
Spring 2020

Measure Characterization
Summer – Fall 2020

Reporting
Spring 2021

Customer Data Segmentation

Begins with utility data

- Data provided by utilities via data request (THANK YOU!)
- Participating utility recent sales and customer counts
- Forecast sales and customer counts
- Non-residential customer database population extracts
- Residential customer sample extracts
- System Load shapes and peak demand definitions for demand impacts

Study segmentation

- Determines # of customers and loads / sales by fuel type
- At the sector and segment levels
- Essential for baseline forecasts
- Remains relatively static over time

Sample frames

- Segmentation also for sample frame construction
- Data sets include contact information
- For primary data collection, including site visits & surveys
- With consumption data, we can segment based on usage

CADMUS

Measure Characterization

Measure characterization includes:
savings, incremental costs, measure interaction, measure life, measure applicability

Align with WI TRM (2020 version)

Facilitate feedback with stakeholders to advise on data gaps and recommended solutions

2017 Study Stakeholder Input

- Feedback on measures to include in study
- Data for measure characterization
- Emerging technologies

2017 Study included

- 702 unique measures
- Over 26,000 permutations
- Across various sectors, segments, vintages, and end uses
- Included behavioral and emerging technologies

CADMUS

Data Collection

Data collection plan must balance priorities
COVID-19 may impact what is possible
Cadmus examining strategies to collect data

Budget constraints:
Need to prioritize (e.g. manufactured homes, religious assembly, new construction segments not targeted in previous study)

Willingness-to-pay surveys for estimating achievable potential

**Survey data:** general equipment saturation, fuel, lighting
Site visits: precise equipment saturation, fuel, efficiency levels, lighting

2017 Study primary data collection included

- Commercial premise site visits and surveys

- Residential surveys, supplemented with existing site visit data

- Industrial expert interviews

CADMUS

Data Collection Considerations

Ex-Ante Program Savings (MMBtu)
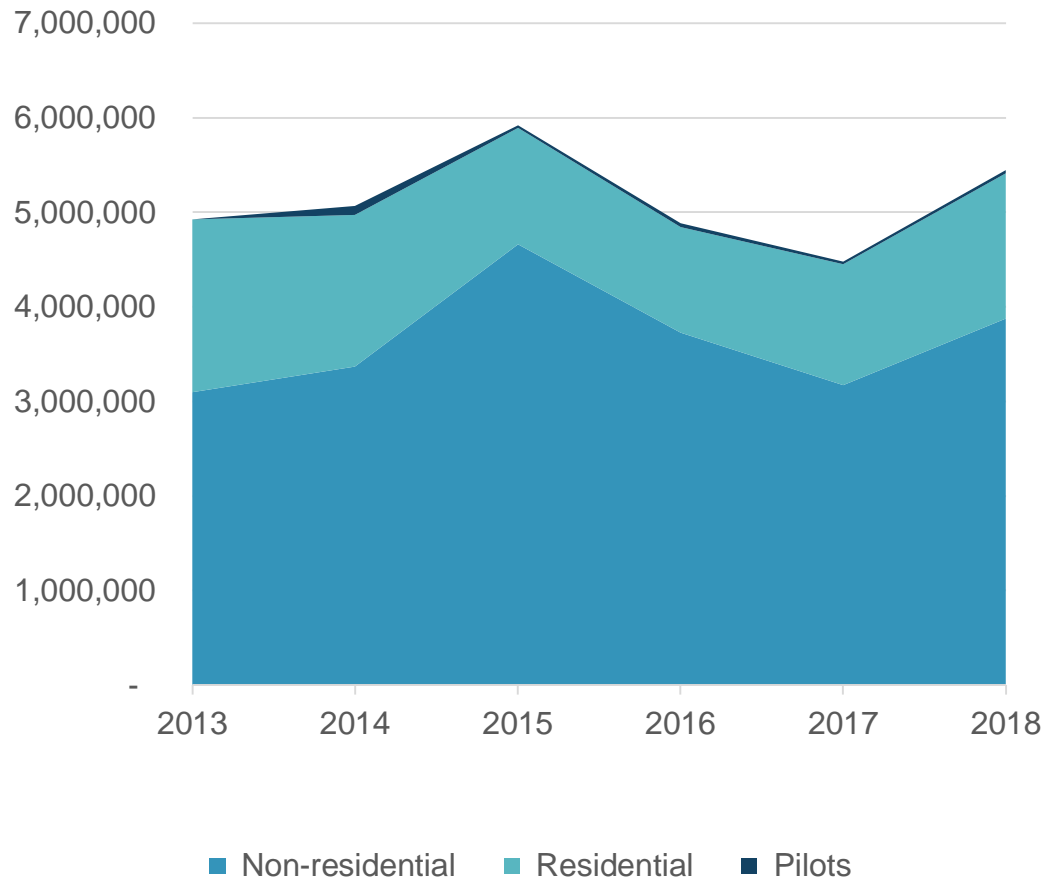
Considerations

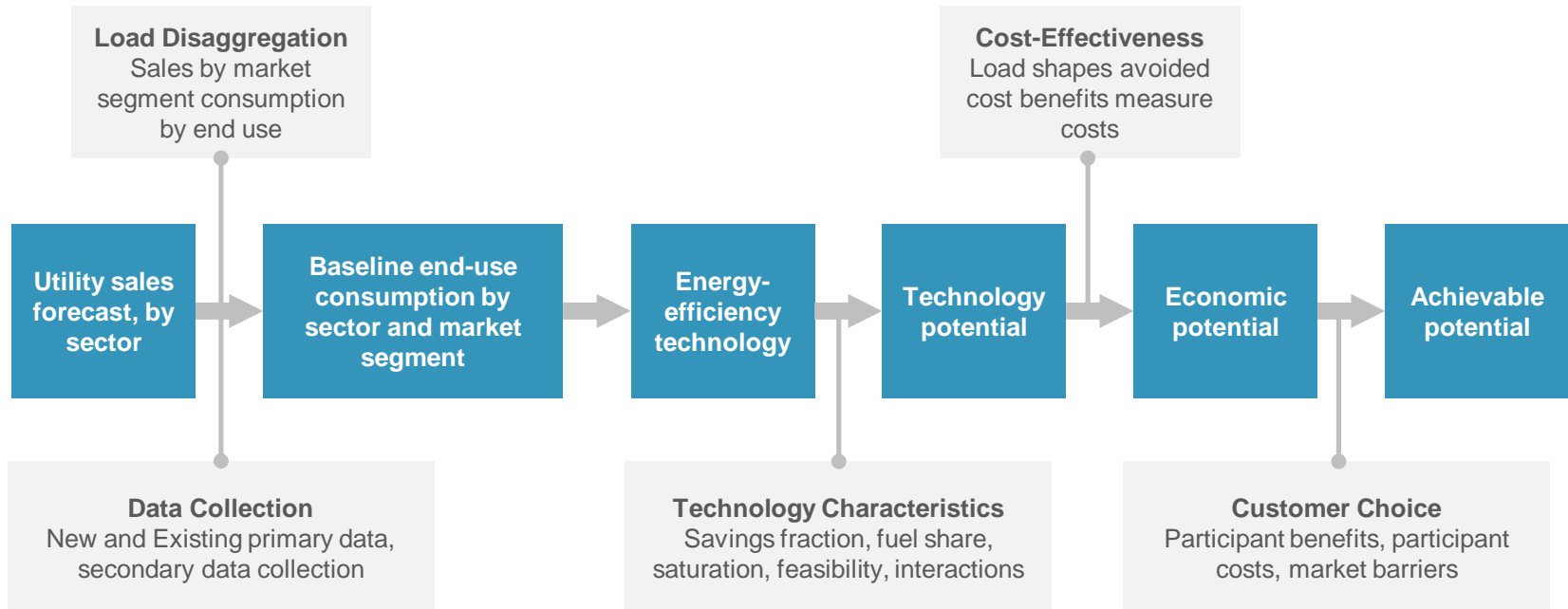Majority of savings achieved through non-residential programs

Non-residential savings driven by process, HVAC, and lighting measures

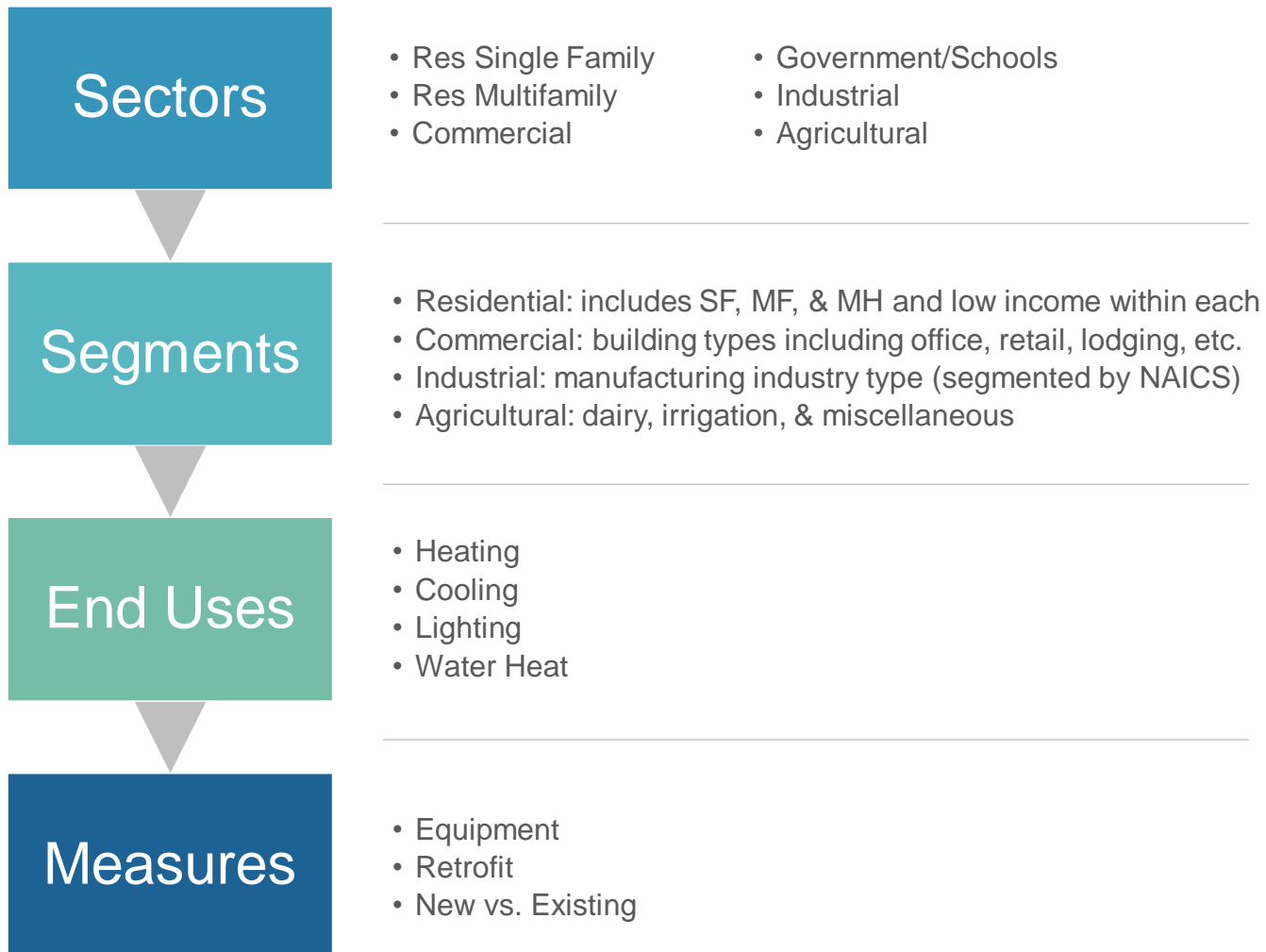Residential savings primarily through lighting, HVAC, and new construction measures

Consider focusing on sector and end uses with high energy savings

Minimize efforts on known end uses that will be phased out or impacted by future code changes (e.g. residential lighting)

CADMUS

Potential Modeling

CADMUS

Potential Modeling

Sectors
- Res Single Family
- Res Multifamily
- Commercial
- Government/Schools
- Industrial
- Agricultural

Segments
- Residential: includes SF, MF, & MH and low income within each
- Commercial: building types including office, retail, lodging, etc.
- Industrial: manufacturing industry type (segmented by NAICS)
- Agricultural: dairy, irrigation, & miscellaneous

End Uses
- Heating
- Cooling
- Lighting
- Water Heat

Measures
- Equipment
- Retrofit
- New vs. Existing
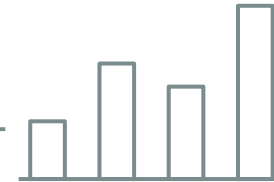
31

CADMUS

Reporting

Draft and final reports provided to stakeholders

- Early results presentation
- Draft report circulated
- Final results presentation

Detailed potential results provided within appendix documents
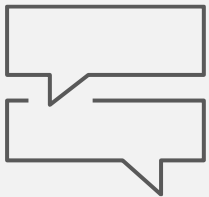
Stakeholder Input:

- Cadmus will circulate written draft of report
- Stakeholders may review draft report and submit comments in writing

The Floor is Open – Feedback Welcome!
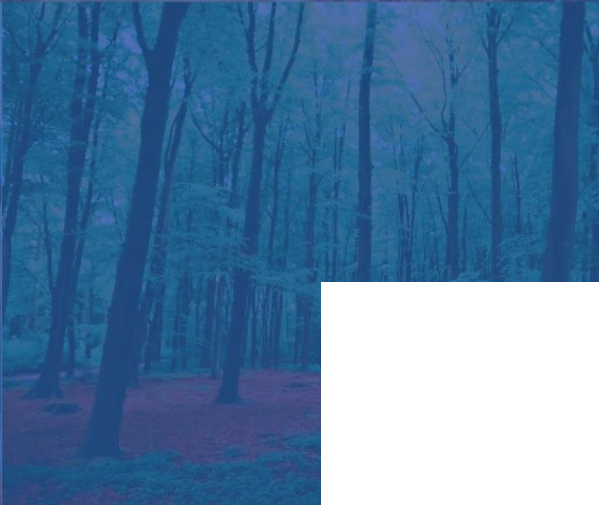
Questions/Comments?

- Data Segmentation

- Measure Characterization

- Data Collection

- Potential Modeling

- Reporting

- Other Questions?

Please add your questions to the meeting chat: we will address questions in the order that they are received & provide opportunity for clarification.

Please remain muted until your question is announced.

CADMUS

5. Next Steps

CADMUS

Thank You

Next Stakeholder Meeting:

Data Collection (June/July)

Cadmus will present data collection options and solicit feedback

Potential follow-up data collection meeting as needed in late summer

Your feedback and input is important, please send us feedback

Other feedback opportunities

Email **Lakin Garth** at Cadmus
(Lakin.Garth@cadmusgroup.com)

or contact **Mitch Horrie** at PSC
(Mitch.Horrie@wisconsin.gov)

CADMUS