



WHEN TRUST MATTERS

# 2020-21 Potential Study Results

August 31, 2021

# Team introductions



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An aerial photograph showing a paved road curving through a lush green landscape. The road is bordered by dense trees and grassy areas. The overall scene is a mix of natural vegetation and man-made infrastructure.

# Agenda

- Team introductions
- Building blocks of the Potential Study
  - Saturation Study overview (Residential and Commercial)
  - Conditional Demand Analysis (CDA) overview
- Potential Study methods and inputs
- Potential Study results

# Potential Study Purpose and Approach

- Assess the potential for electric energy (kWh) savings from company-sponsored demand side management (DSM) programs over ten years (2020-2029).
- This study used DNV's DSM ASSYST™ model to examine DSM potential from new and existing residential and commercial buildings in Dominion Energy's service territories.
- The assessment produced:
  - Estimates of the magnitude of potential savings on an annual basis under two programmatic design scenarios for DSM measures that are presently commercially available and based on current codes and standards;
  - Estimates of the costs associated with achieving those savings;
  - Calculation of the cost-effectiveness of the achievable potential based on the estimates above.

# Dominion Energy recent project history

## **Residential and Commercial Saturation Studies (2013)**

## **Residential Conditional Demand Analysis (2014)**

- Provided unit energy consumption (UEC) estimates for a range of electric end uses and market segments for the DSM potential study

## **Potential Study (January 2015)**

- A detailed market review of energy efficiency program potential
- Covered residential, small nonresidential, medium non-residential, and large non-residential

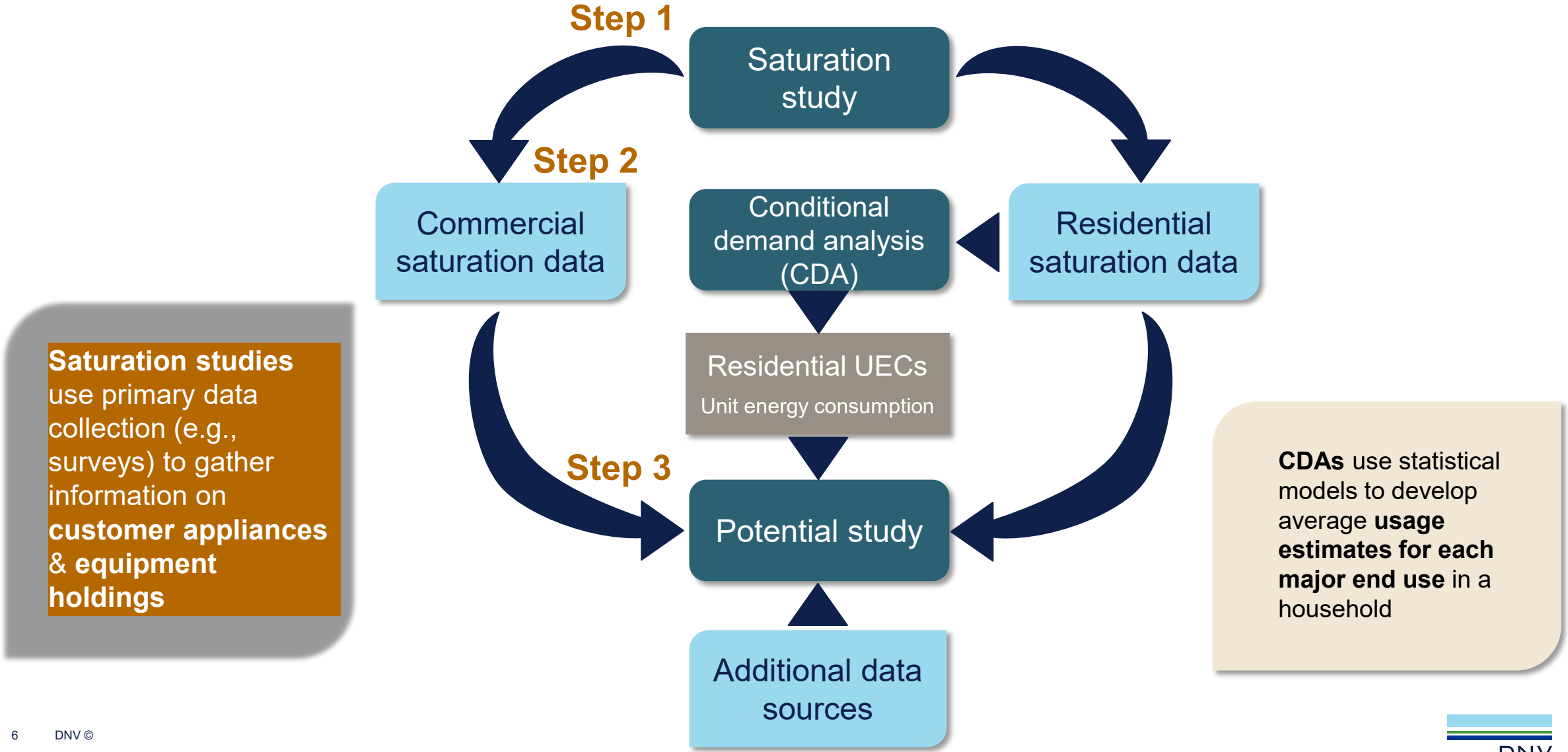
## **Baseline Update (2016) and Potential Study (2017)**

- RES: Scope included primary data collection (RASS), CDA, and Potential Study
- COMM: Updated 2013 baseline with end use intensities (EUI) from 2012 U.S. Energy Information Administration, Commercial Buildings Energy Consumption Survey (CBECS) microdata that was released in 2016 (formerly using 2003 data)

## **Potential Study Update (2018)**

- Removed COMM exempt customers in response to new legislation

# Relationship among studies



# 2019–20 data collection results



## Residential Study

- Data collected from Nov. 2019 – Mar. 2020
- Achieved 6.5% response rate
  - 8,100+ respondents used in the analysis (**over 200% of goal**)
  - 5,500+ respondents completed the entire survey

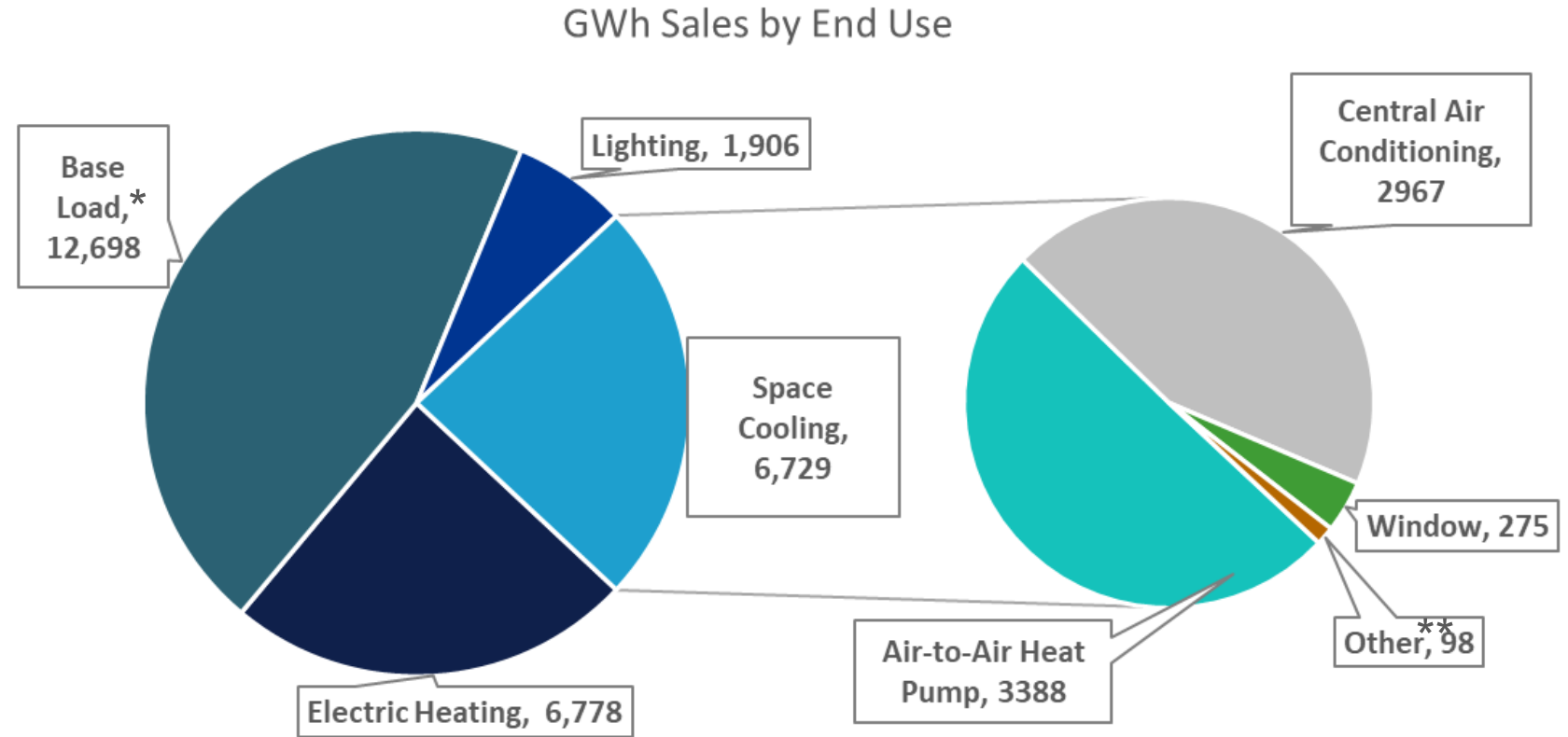


## Commercial Study

- Data collected from Jan. 2020 – Sept. 2020
- Achieved 5.1% response rate
  - 1,652 respondents used in the analysis (**over 100% of goal**)
  - 1,347 respondents completed the entire survey

# Conditional demand analysis overview

- Objective: Develop average usage estimates for each major end use in a household
- Based on statistical regression models using household end-use data (survey data), electric usage/billing data, and weather data
- CDA models major end-uses by residential customers (e.g., heating, space cooling, and water heating, among others)



\* "Base Load" include all other loads such as water heating, refrigeration, cooking, and miscellaneous plug loads.


\*\* "Other" includes all cooling loads not defined by the model, such as ground-source heat pumps, through-the-wall air conditioners, fans, etc.



**CDA analysis results are a direct input into the Potential Study**



# Additional data sources




## Measure Data

- EIA CBECS
- **Saturation Study**
- **CDA**
- ENERGY STAR Calculators
- EIA Data for South Atlantic
- Mid-Atlantic TRM (STEP Manual)
- **Dominion Energy EM&V Results**


## Economic Data

- **Customer Discount Rate**
- **Inflation Rate**
- **Utility Discount Rate**
- **Avoided Cost and Average Rate Forecasts**
- **Line Loss Estimates**



## Building Data

- **Billing data to identify consumption**
- **System Load Data**
- **Data reported to EIA from Dominion Energy to determine number of customers**

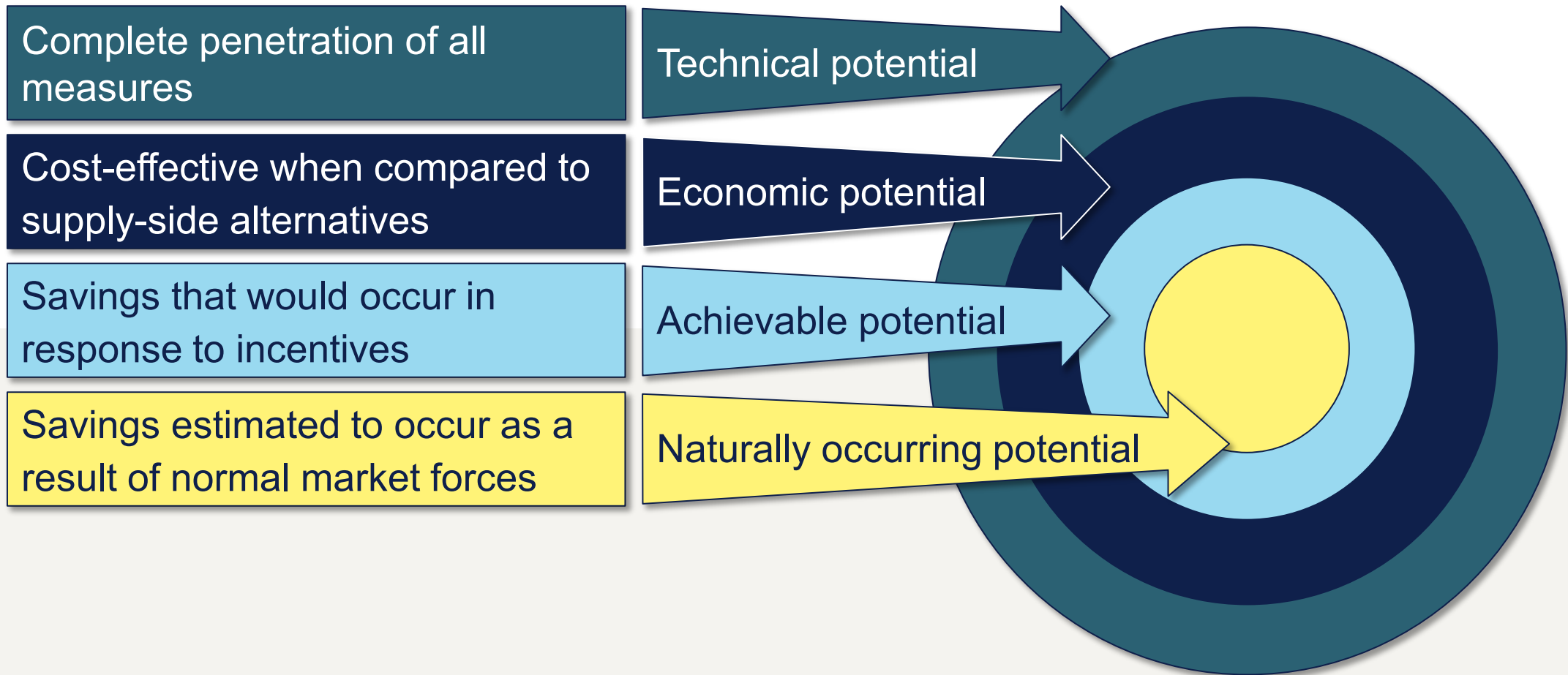


## Program Budgets

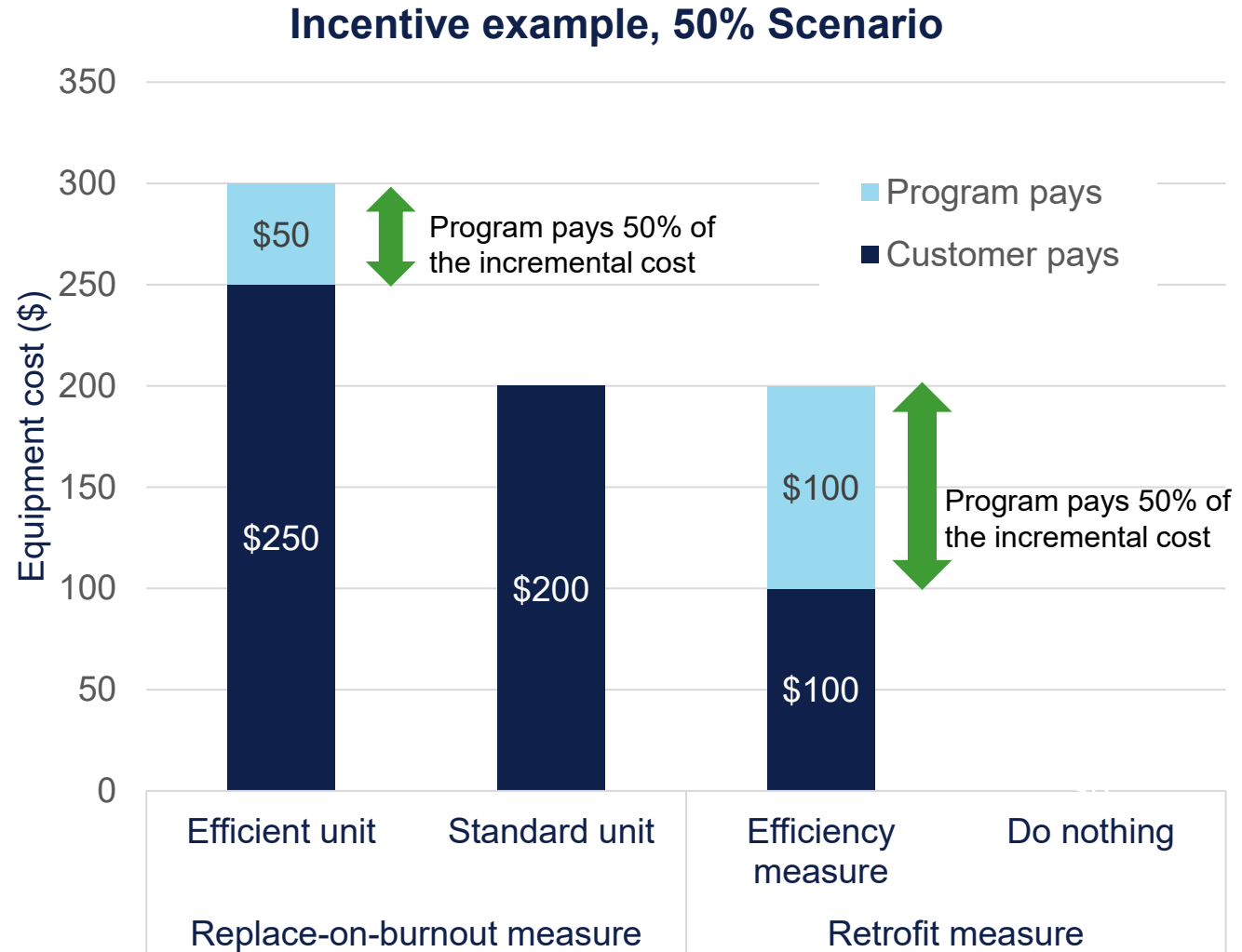
- **Dominion Energy Program Tracking Data**

**Bold text** indicates a data source that contains Dominion-specific information.

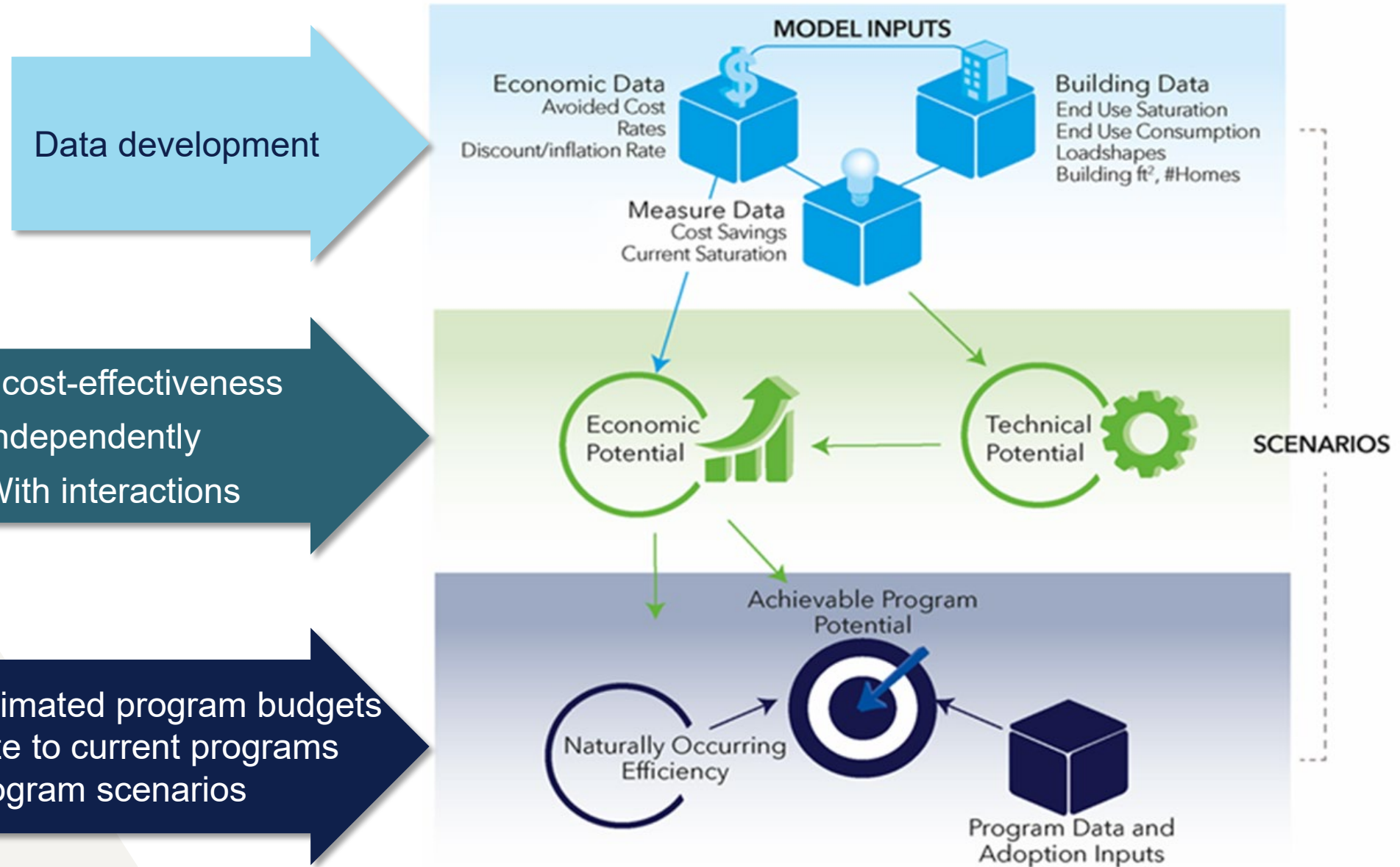
# Types of potential: conceptual overview



# Achievable potential scenarios



# Potential analysis

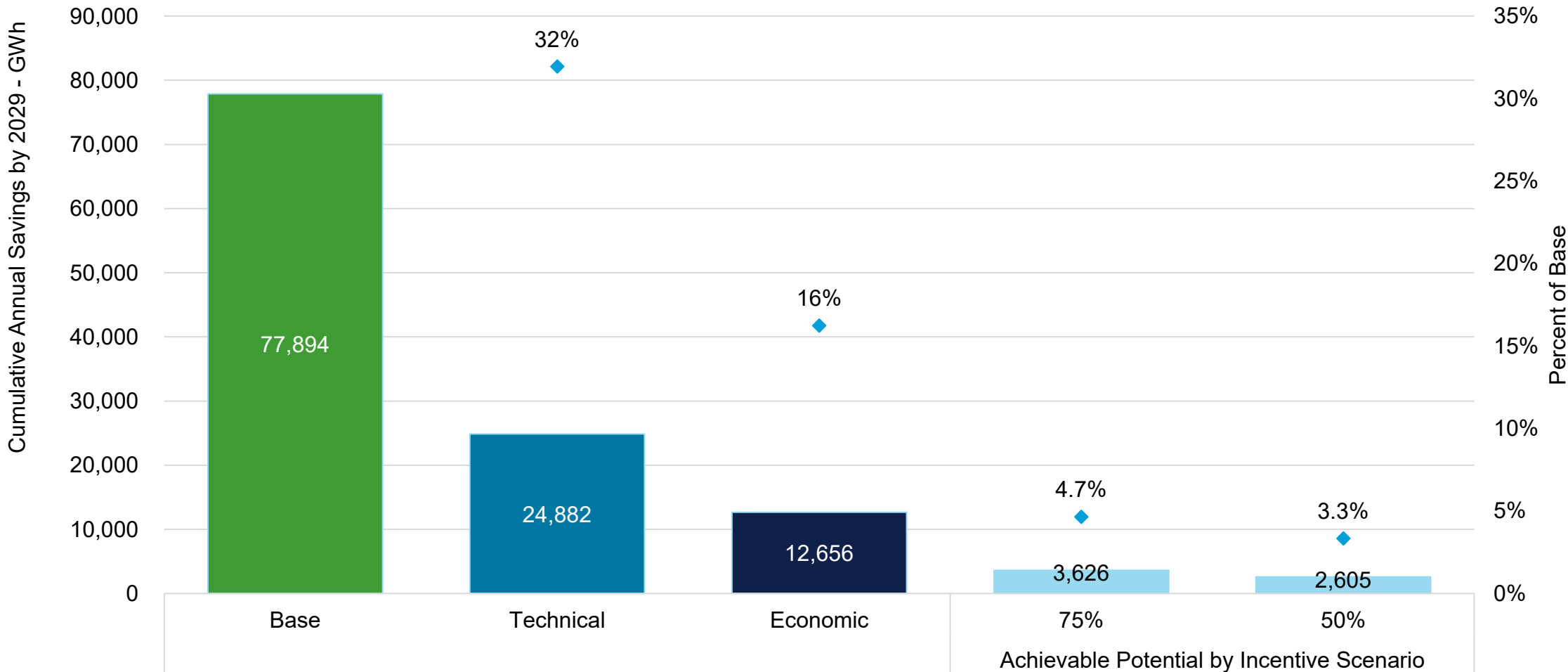


**Test cost-effectiveness**

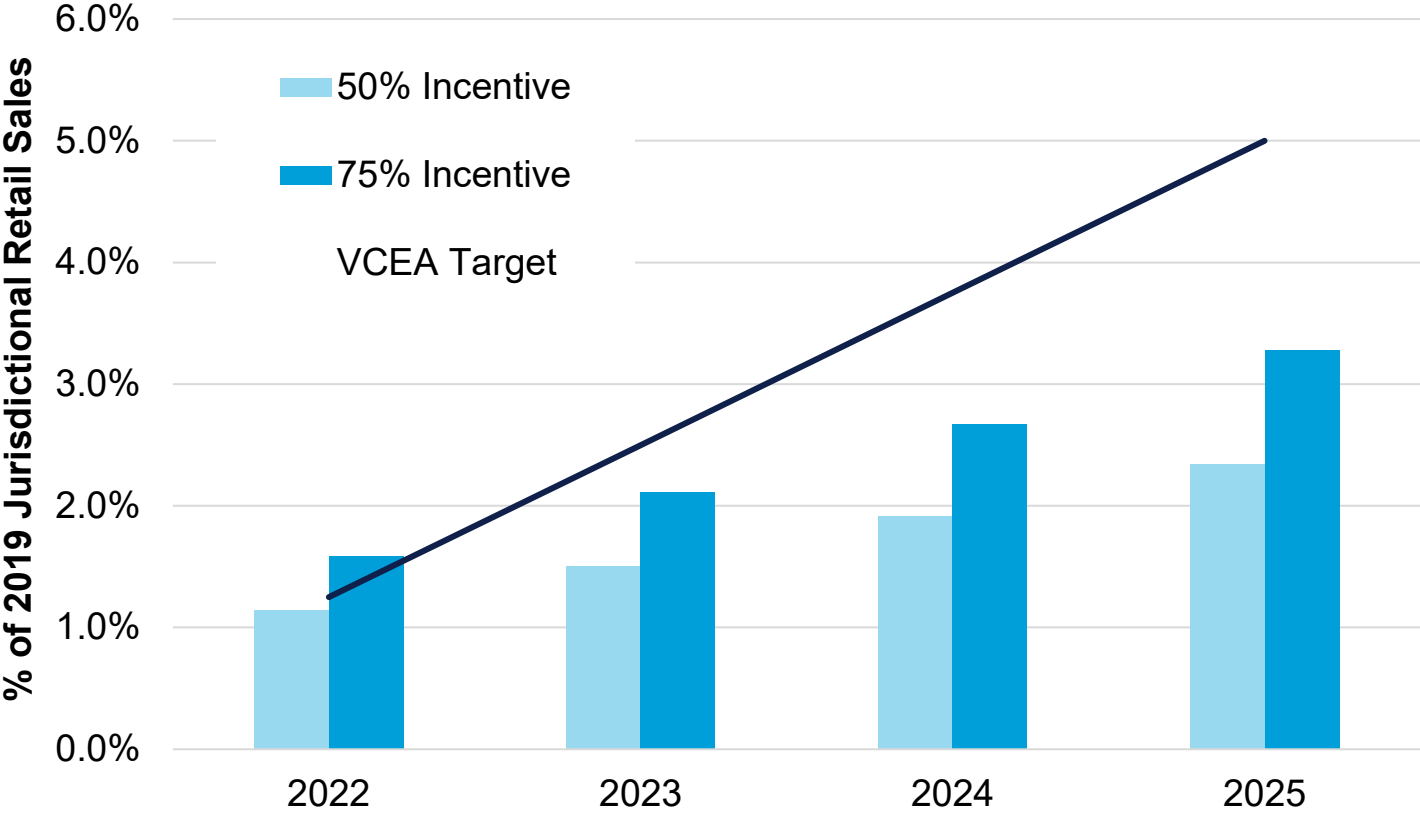
- Independently
- With interactions

- Add estimated program budgets
- Calibrate to current programs
- Run program scenarios

# Estimated electric energy-efficiency savings potential, 2020-2029, VA and NC combined



# Comparison of VA Achievable DSM potential to VCEA savings targets, % of 2019 jurisdictional retail sales



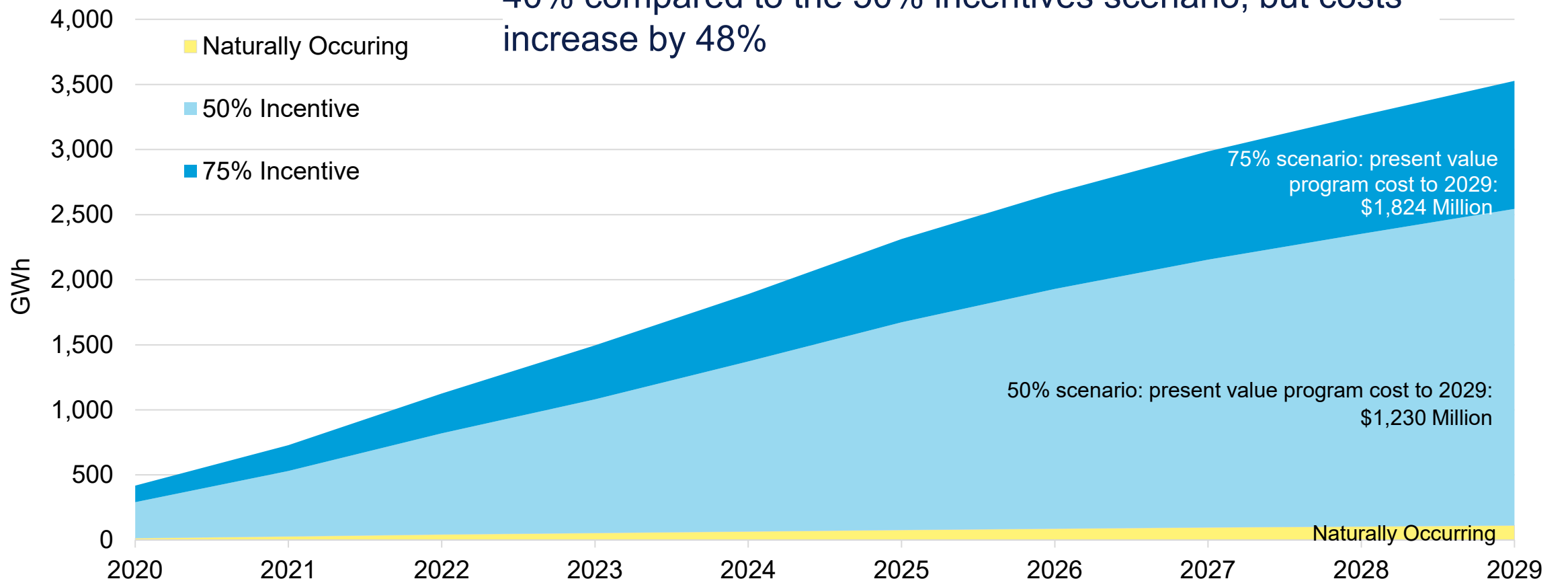
Factors influencing results include Dominion’s low avoided costs and the ongoing transformation of the lighting market to LEDs.

Long Term Plan to address gaps in portfolio.

- As modelled, the portfolio-level TRC is less than 1 in VA for both scenarios
- The model adoption curves were calibrated to Dominion's existing programs
- These results include all measures in existing program, plus other TRC cost-effective measures, and income-qualified measures to meet the VCEA requirements. They do not include the voltage optimization measure

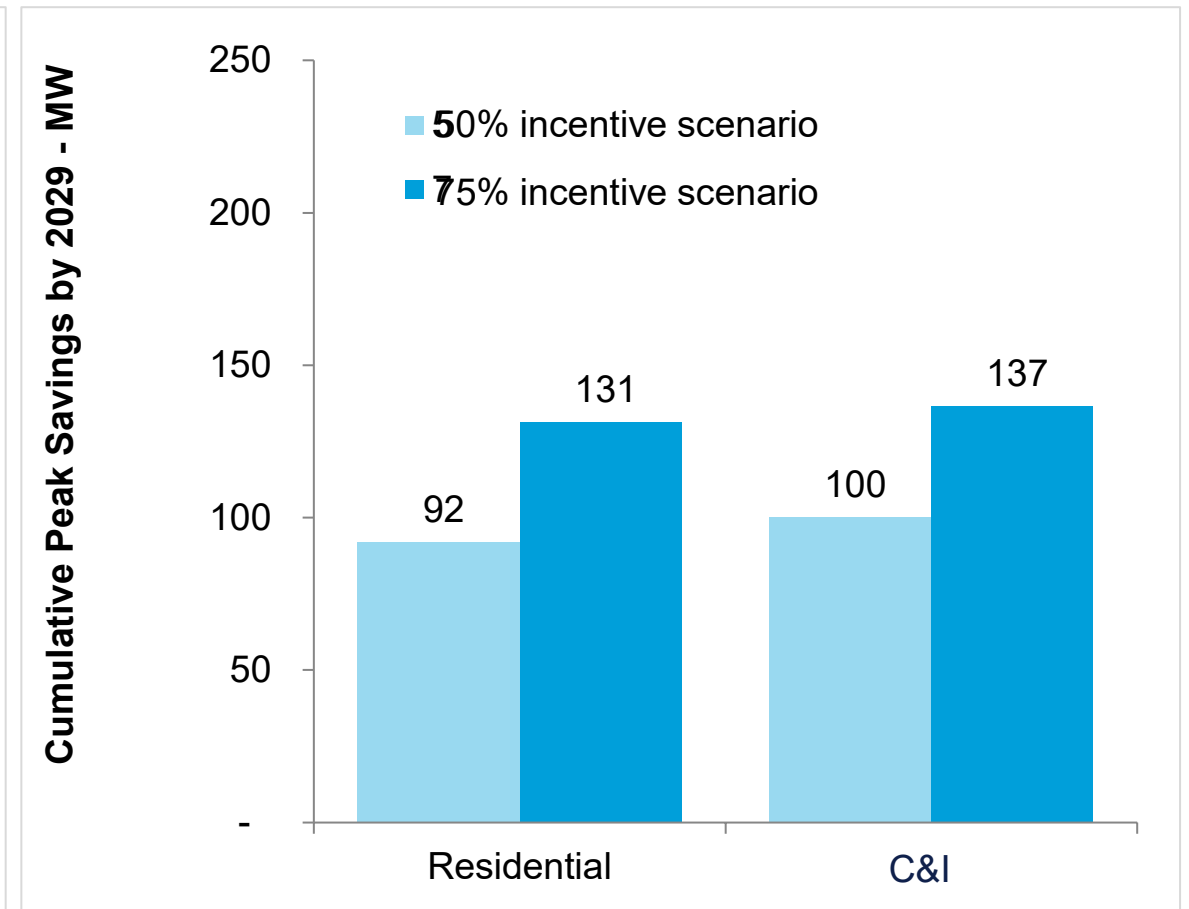
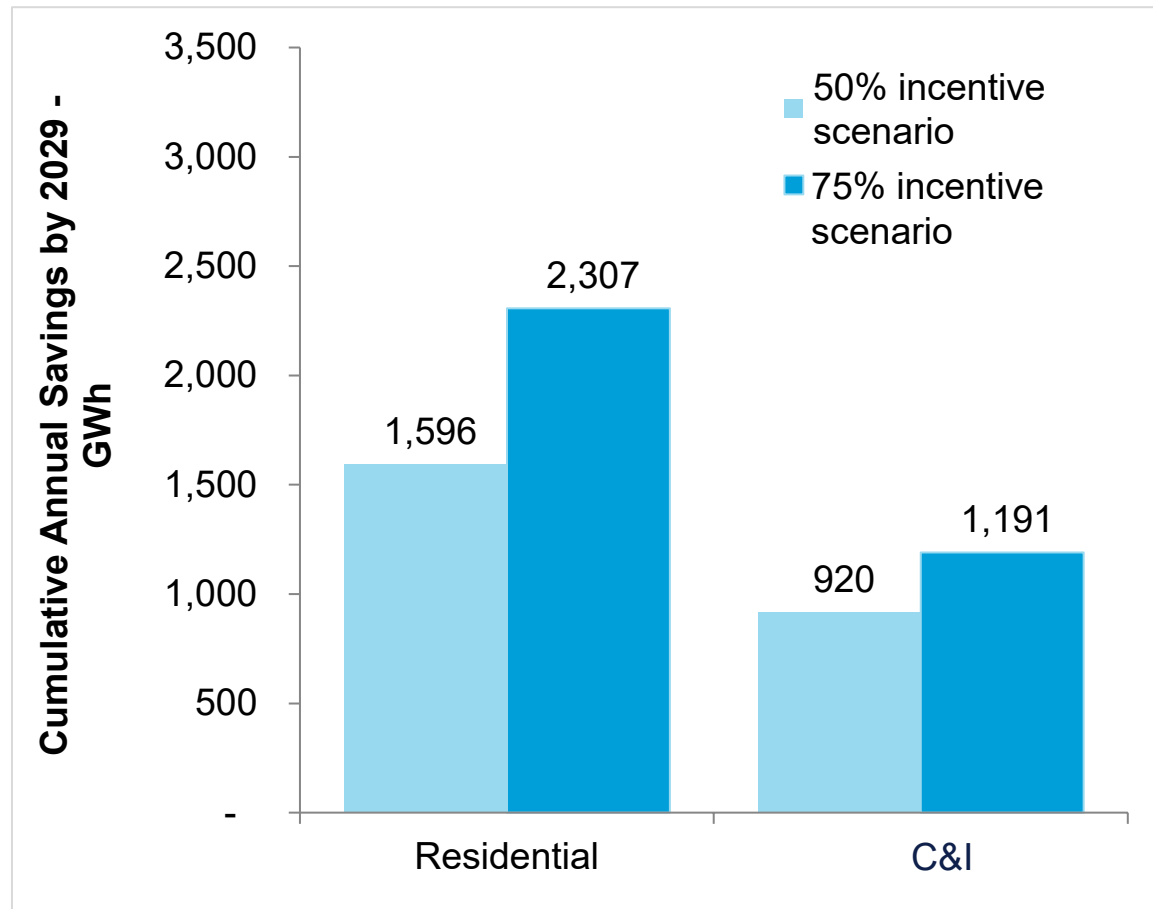
# Achievable electric energy savings: all evaluated sectors, Virginia

The 75% incentives scenario increases net savings by 40% compared to the 50% incentives scenario, but costs increase by 48%



# Net achievable savings by sector

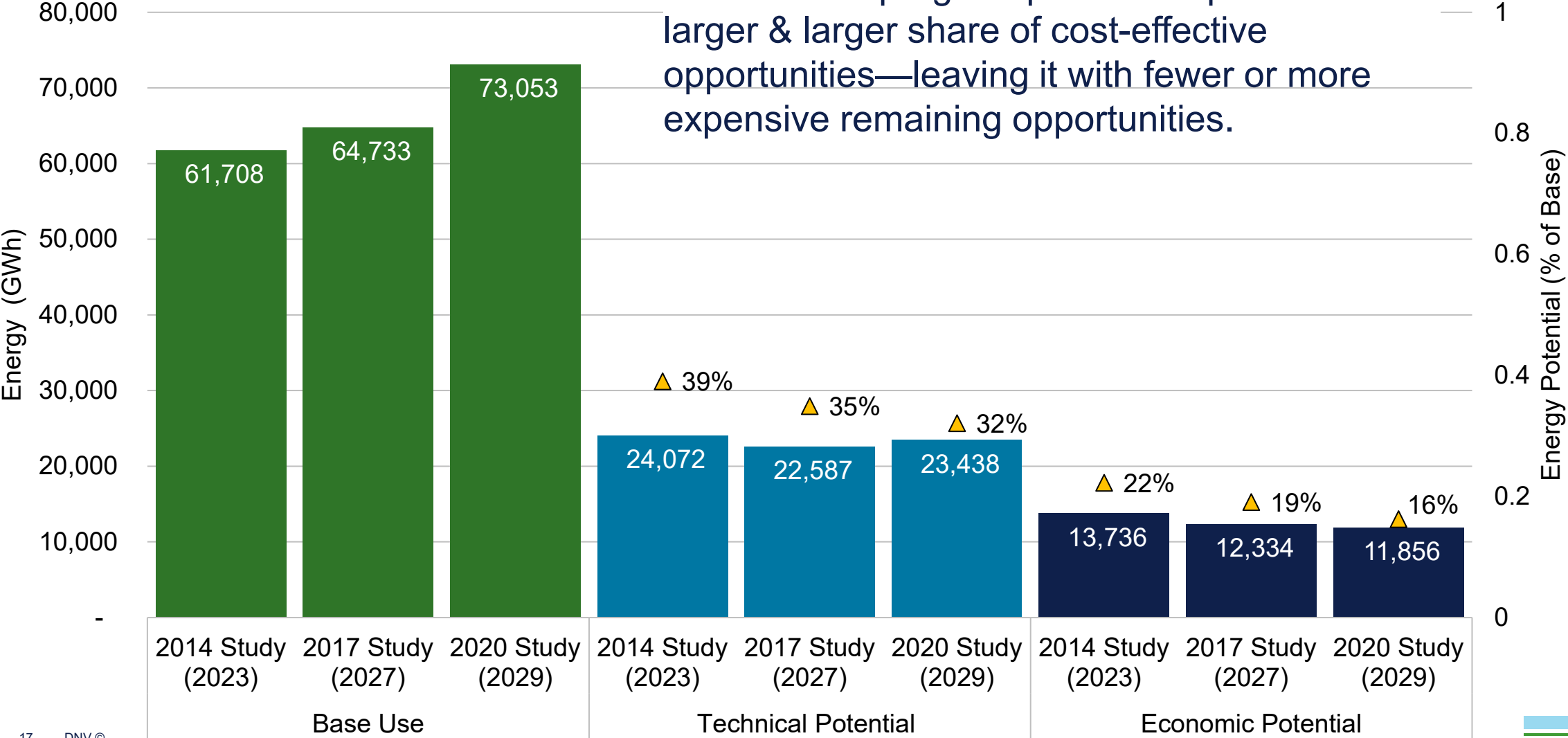
Achievable energy savings are higher for the residential sector, but demand savings are balanced between residential and commercial & industrial (C&I)





# Trends in potential over time

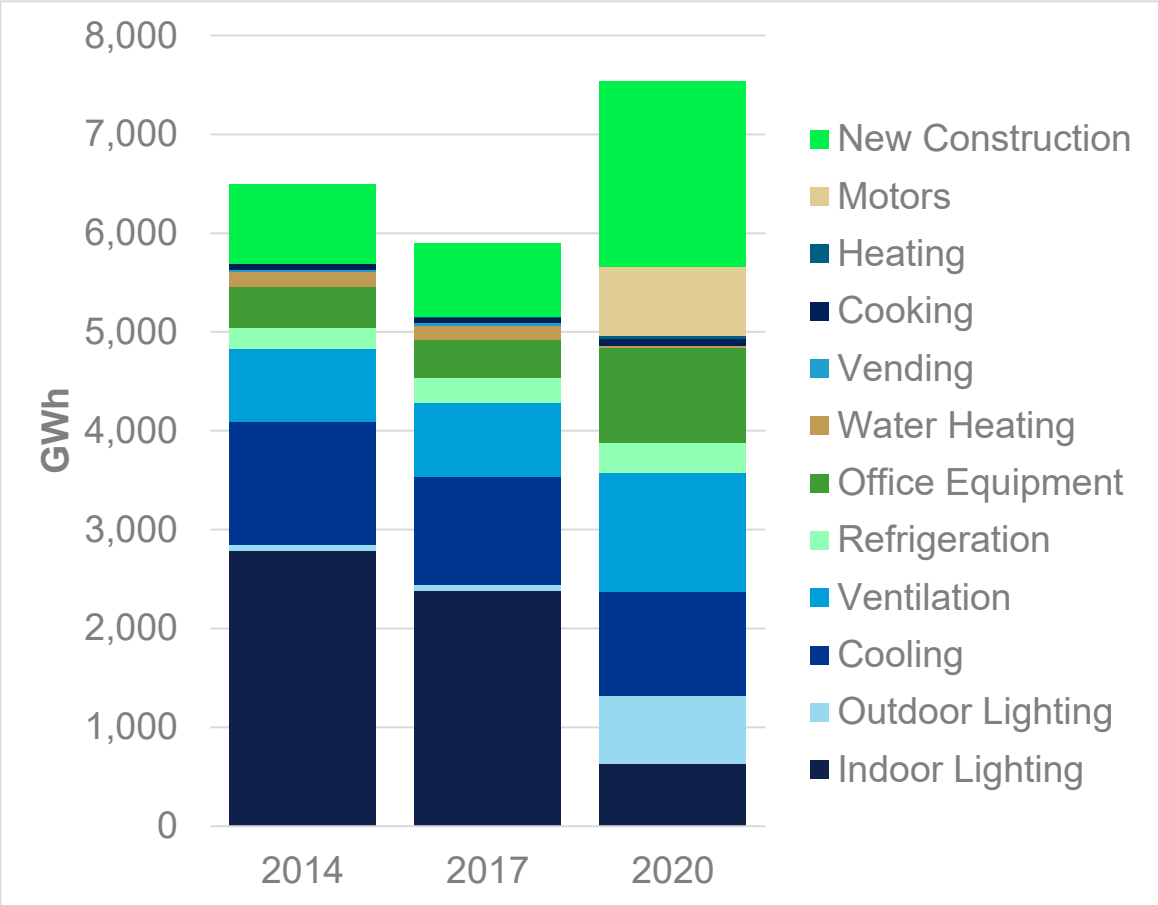
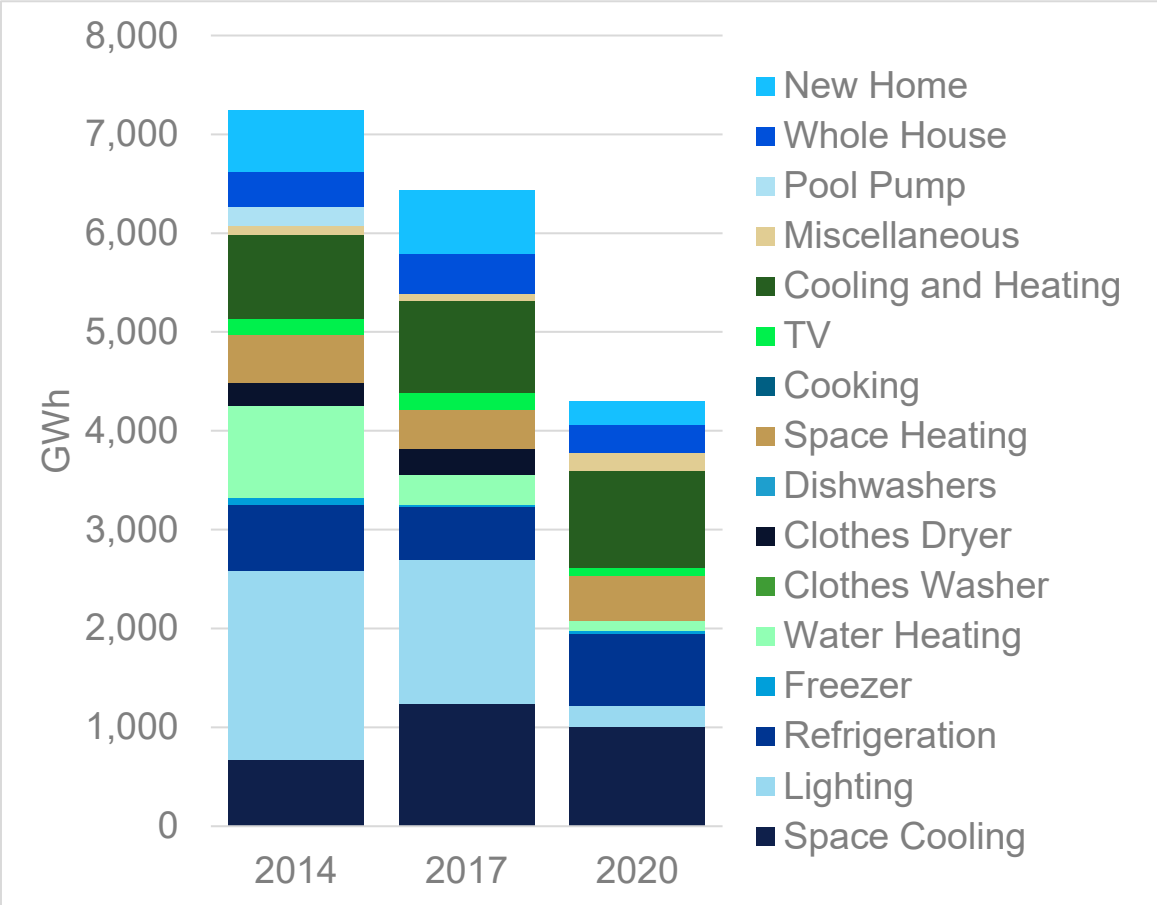
A successful program portfolio captures a larger & larger share of cost-effective opportunities—leaving it with fewer or more expensive remaining opportunities.



# Trends in economic potential by end use

Residential potential has decreased over time...

...but non-residential potential has increased over time



Residential

Non-residential

# Thank you!

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