# LTGIP Stakeholder Workshop
# Gas Forecasting

November 19, 2024

# Workshop Logistics & Topics

- Dedicated Web Page: AmerenIllinois.com/GIP
  - *Link to filed Workplan*
  - *Meeting information and materials*
  - *Comment portal*
  - *Subscribe to AIC Distribution List*
- Previous Workshops
  - *Introduction & work plan development*
  - *Gas System Overview and Regulations*
  - *Capital Planning and Gas Forecasting*
- Possible Upcoming Workshop Topics
  - *Gas Forecasting Continued*
  - *NPAs / Innovation levers*
  - *Impact Analysis of Preferred Portfolio*
    - *economics, equity, and environment*
- Next workshop planned for early Q1 2025

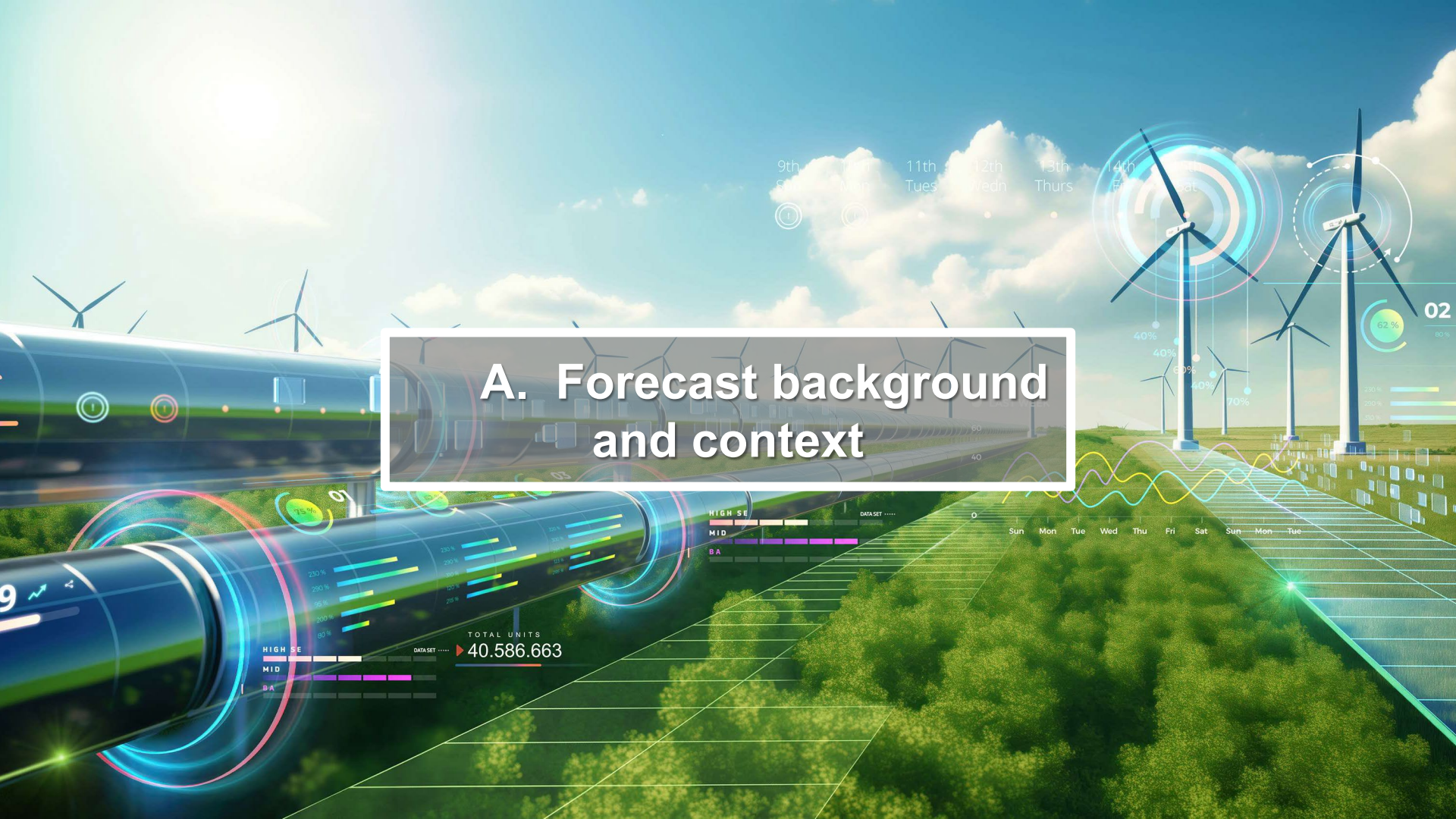
# Today's workshop will cover the intended evolution of the Ameren Illinois natural gas demand forecast and highlight next steps for scenario development

| # | Content |
|---|---|
| A | Background and context |
| B | Gas demand forecast framework and drivers |
| C | 20-year gas demand forecast interim base case results |
| D | Next steps |
| E | Q&A |

## Today's objectives

Ameren Illinois and Roland Berger have prepared **slides** related to the demand **forecast including interim base case results…**

… Scenario-based implications and perspectives will be updated in 2025


A. Forecast background and context
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# The ICC directed the gas utilities to file a gas infrastructure plan by July 2025 – Ameren Illinois (AIC) is developing a 20-year forecast beyond the required 5-year outlook

## LTGIP background

- At the end of 2023, both the AG and PIO[1)] recommend the Commission require the Company to file detailed infrastructure plans
- The ICC directed AIC to file a long-term infrastructure plan with the Commission every two years beginning July 1, 2025
- AIC already filed its workplan for the LTGIP in July 2024
- The long-term infrastructure plan is intended to include a 20-year planning horizon with 5-year action plan of investments

## AIC objectives

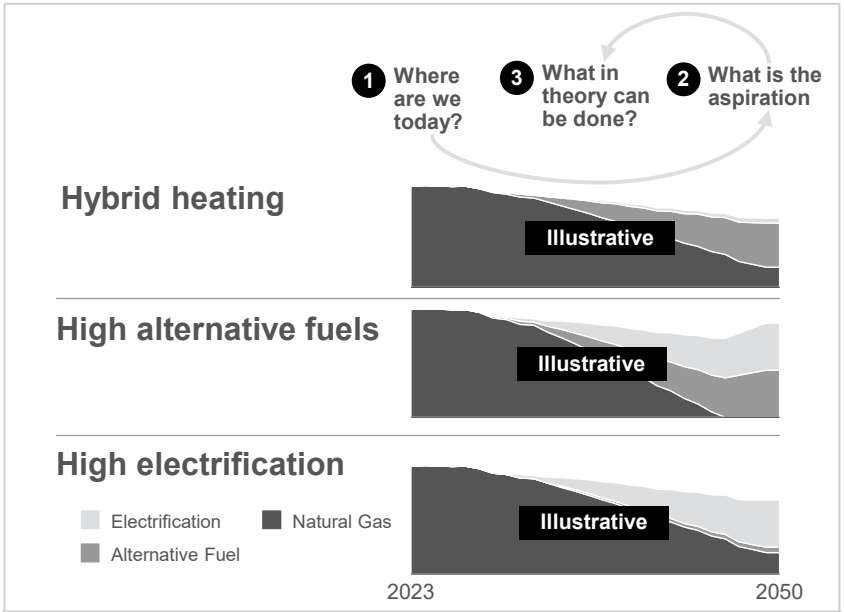
- *AIC is developing its first **20-year gas demand forecast** to use as an informative input for the 20-year planning horizon.*
- ***The forecasting approach and process is expected to continue to evolve** for future iterations of the LTGIP*

# The LTGIP demand forecast will provide a scenario-based, forward-looking view rather than a 'back-casting' approach from external policy goals

Intention of the LTGIP natural gas demand forecast

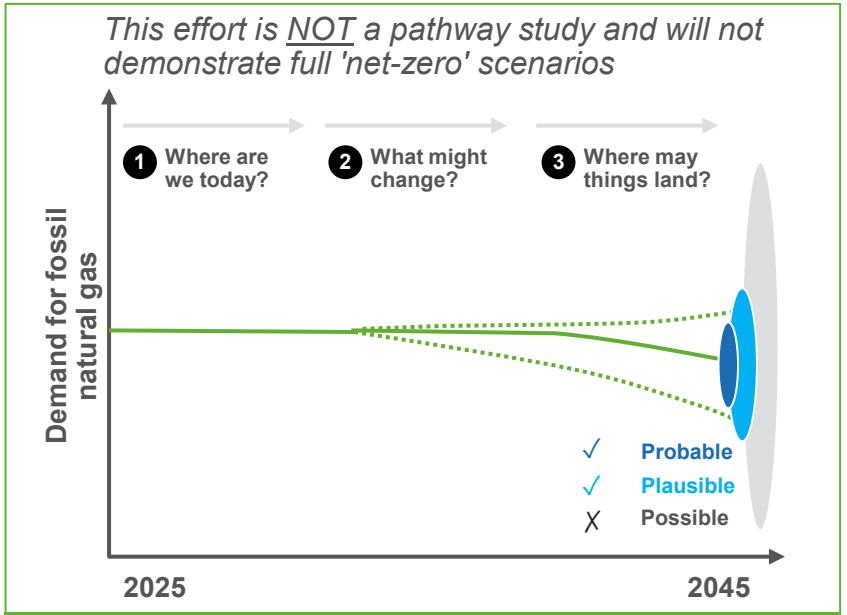
Illustrative

## Pathway 'back-casting' study examples



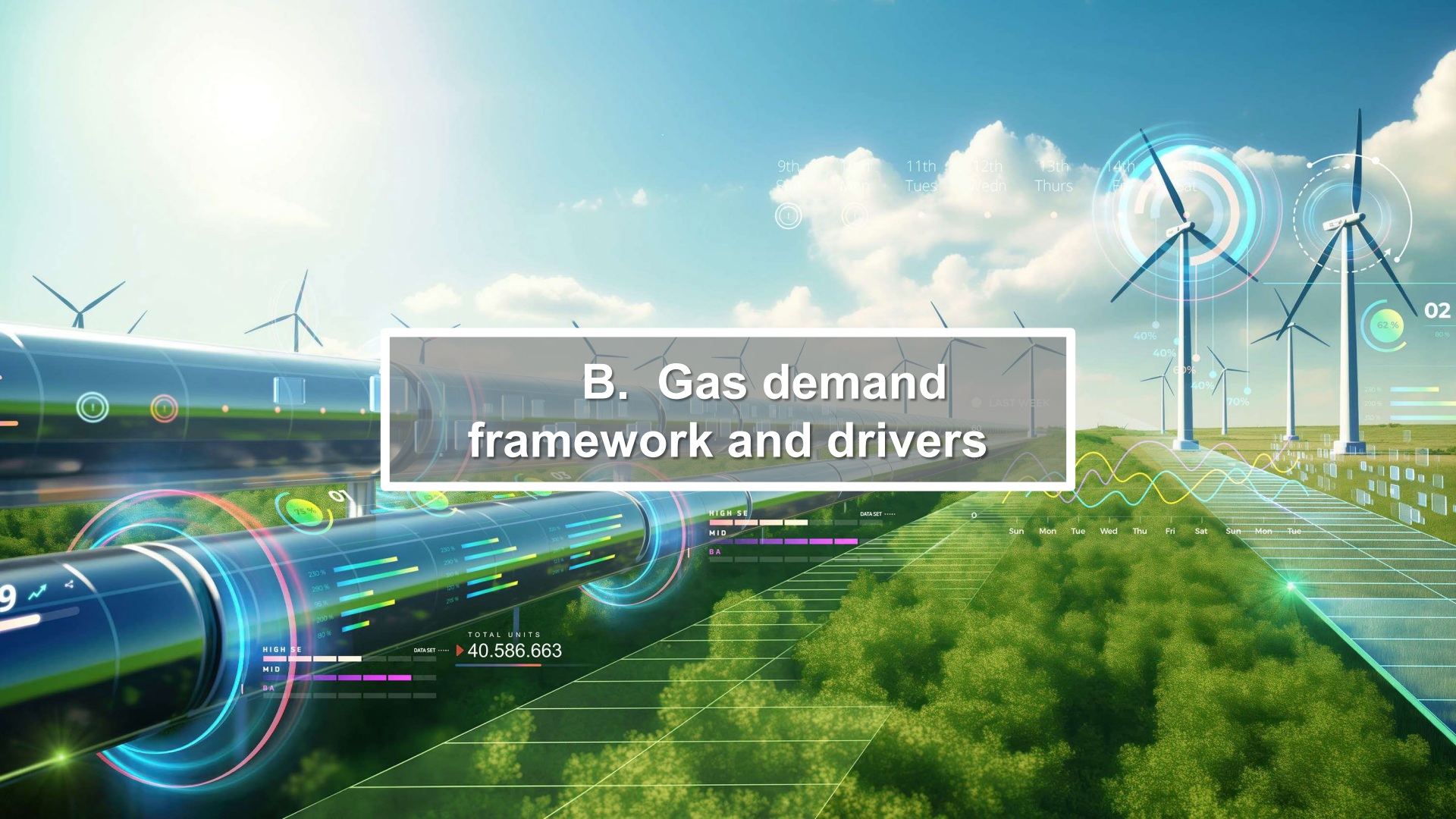

Pathways studies identify potential mechanisms or paths to meet conceptual decarbonization aspirations, including possible book-end scenarios

## 2024-25 LTGIP Gas Demand Forecast




Forecast to support infrastructure planning around the plausible and probable scenarios, based on bottom-up developments

Source: AIC, Roland Berger


B. Gas demand framework and drivers
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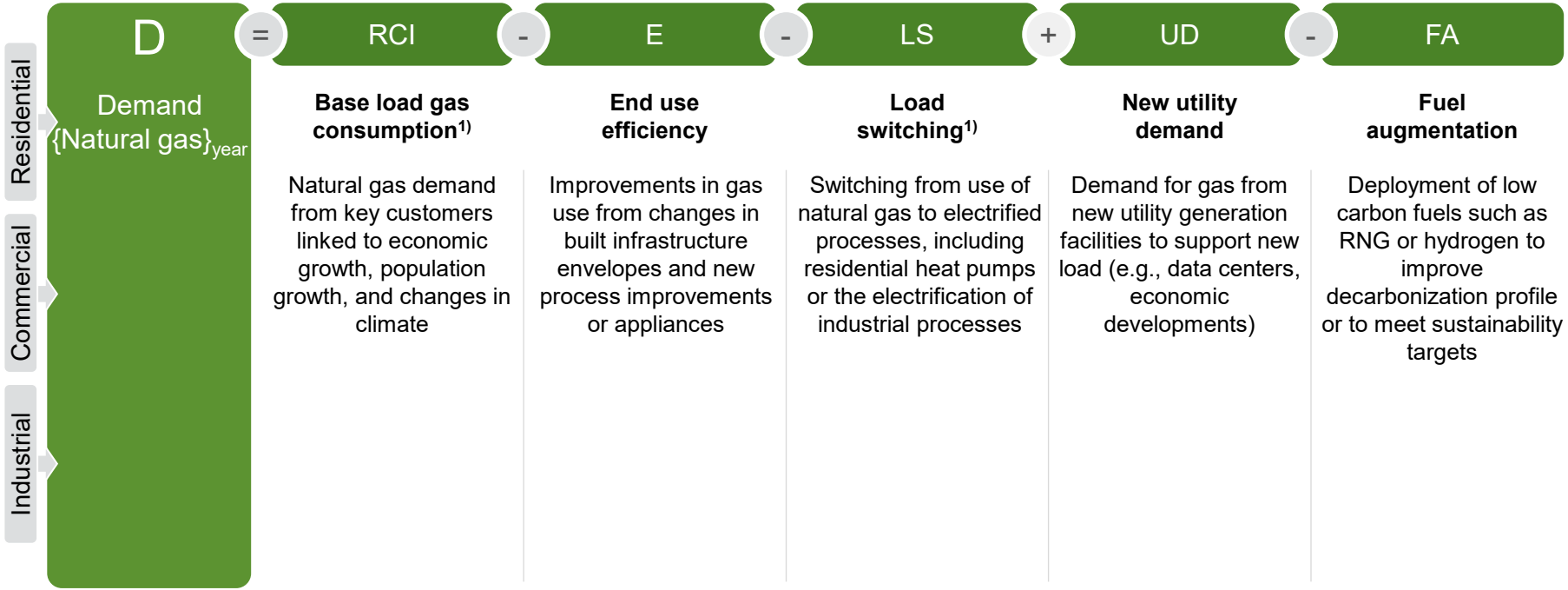
# Demand for gas can be derived from shifts across five major areas: Base load consumption, efficiency, load switching, electric utility demand, and new fuels

## Overview of drivers for demand for natural gas




1) Includes residential, commercial, and industrial

Source: Roland Berger

# Natural gas demand faces headwinds from tepid customer growth in IL, expected changes in climate, and developments in end use efficiency

## Overview of natural gas trends and drivers – Demand (1/2)

| Overall market driver | Specific drivers | Gas demand outlook | Impact magnitude (Low / Med / High) | Comments |
|---|---|---|---|---|
| 1. Base load growth | Organic customer growth | → | Low | Key driver of demand, especially in Illinois, where net migration is relatively flat for residential and commercial despite uptick in industrial customers |
| | Re-industrialization | ↗ | Low | Direct natural gas demand may not be significant, but large energy users such as data centers or battery manufacturing facilities in the Midwest may necessitate additional firm generation (e.g., gas turbines) in MISO |
| | Climate change | → | Med | Winter demand for gas for heating may volumetrically decrease, but increased frequency of 'low probability' climate events could sustain need for the physical system infrastructure to provide peaking resilience |
| 2. End use efficiency | Built infrastructure energy efficiency | ↘ | Med | Improvements of efficiency in building envelopes, especially for new builds and retrofits, can reduce the overall heating demand for gas in buildings; Critical to ensure built environment improvements ahead of electrification to hedge energy burden |
| | Gas end-use process efficiency | ↘ | Low | Technological developments and regulatory requirements in efficiency of end use processes for appliances such as furnaces and water boilers will create downward pressure on demand; However, expected adoption could be limited based on local demographic income constraints |

↗ Likely to increase NG demand → Neutral ↘ Likely to reduce NG demand

Source: Roland Berger

# However, electrification may be balanced by new utility demand spurred to meet electric load – Despite volume changes, infrastructure will remain critical

## Overview of natural gas trends and drivers – Demand (2/2)

| Overall market driver | Specific drivers | Gas demand outlook | Impact magnitude (Low / Med / High) | Comments |
|---|---|---|---|---|
| **3. Load switching (Electrification)** | Residential and commercial electrification | ↘ | Med | Residential sector comprised 15% of total US natural gas consumption in 2022; Electrification of home-dwelling appliances spurred by regulatory requirements and improving economics (partly linked to incentives) |
| | Industrial electrification | → | Low | Industrial sector comprised >30% of total US natural gas consumption in 2022; Electrification difficult due to high level of heat and energy intensity, absent regulation |
| | Gas restrictions | ↘ | Low–Med | Much of the Midwest has 'bans on natural gas bans', although there are discussions of line extension eliminations that could reduce the pace of new additions |
| **4. Utility demand** | Electricity generation from gas turbines | ↗ | Low–Med | In short term, natural gas demand will rise to ensure grid reliability as coal and other fossil units retire, and long-term demand may be buoyed by CCUS regulation pathways for power plants; May be limited impact for AIC for demand, but affect pipeline supply |
| **5. Fuel augmentation** | RNG | ↘ | Low–Med | Easiest alternative fuel to integrate (can be injected directly into pipelines) but limited overall feedstock supply to serve demand; Production costs are currently higher than natural gas, despite subsidies that may not continue in late 2020s |
| | Hydrogen | ↘ | Low | Hydrogen blending is a potentially expensive path to decarbonization; Economics for utility cases and supply available are challenges; Technical limitations for pipelines may require additional infrastructure upgrades |
| | Syngas/e-methane | ↘ | Low | A potential 'drop-in' fuel that is expected to develop after 2030, although feedstock is expected to be limited; Use likely only possible if green H2 reaches high availability and very low cost per unit |

↗ Likely to increase NG demand → Neutral ↘ Likely to reduce NG demand

Source: Roland Berger


C. Gas demand forecast
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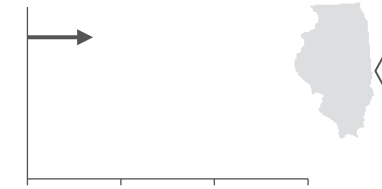
# During the previous workshop, AIC explained its approach to volumetric demand forecasting and how it links into the capital planning process

## Methodology overview – LTGIP gas demand forecast (1/2)

0 Annual volumetric gas forecast | 1 Develop 20-year macro gas demand forecast | 2 Derive local system demand forecast | 3 Integrate scenarios

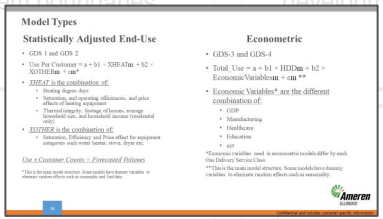
Develop annual 5-year forecast



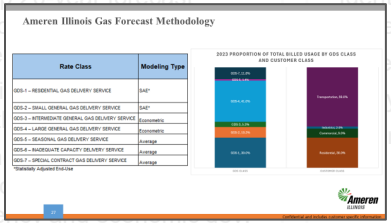

- Conducted as a part of annual planning by customer class

### Data sources

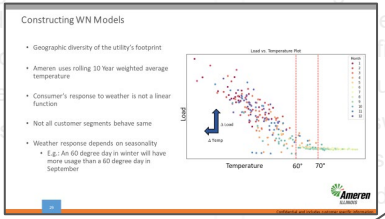

### Model types




### Forecast approach




### Adjustments and considerations




Current practice | Practice extended by LTGIP process

# Today we'll highlight the overall methodology to develop the 20-year base case consumption forecast, including the overall framework and trends assessed

## Methodology overview – LTGIP gas demand forecast (2/2)

**In focus for today's workshop**

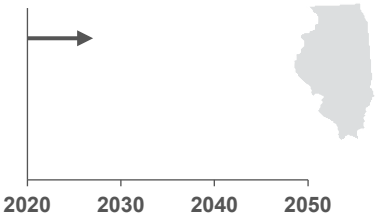
0 Annual volumetric gas forecast

1 Develop 20-year gas consumption forecast

2 Derive local system demand forecast

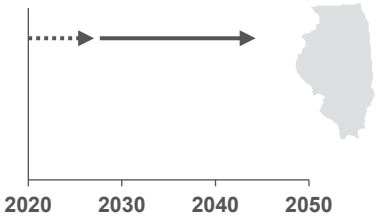
3 Integrate scenarios

### Develop annual 5-year forecast



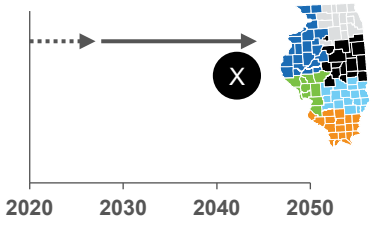

- Conducted as a part of annual planning by customer class

### Develop 20-year forecast



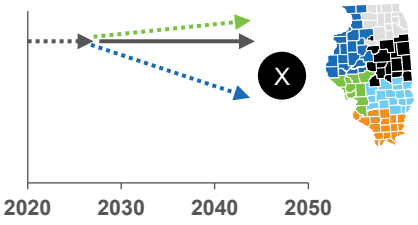

- Develop 20-year forecast based on similar methodology as 5-year approach today
  - Consider economic/customer growth, climate change, etc.
  - Continuity of current trajectory for energy efficiency and economic dev.

### Derive top-down local demand based on system boundaries




- Identify and segment sub-systems' boundaries
- Assess local factors such as:
  - Physical system constraints
  - Demographics

### Assess each local segment's development across scenarios




- Integrate scenarios at the semi-local level where possible linked to identifiable differences in :
  - End use efficiency
  - Fuel augmentation
  - Load switching
  - Utility demand

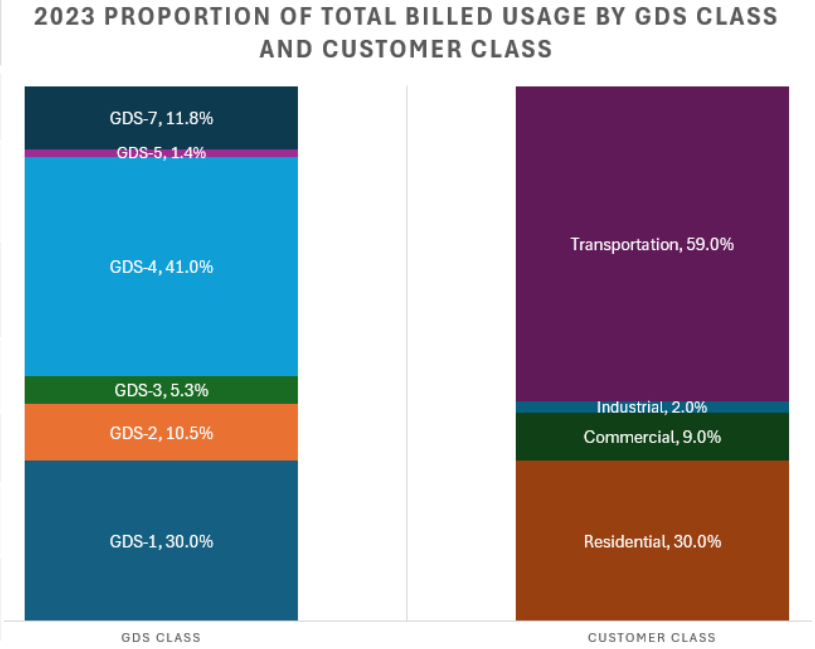
Current practice | Practice extended by LTGIP process

Source: AIC, Roland Berger

# AIC forecasts volumetric gas demand by GDS class with varying methodologies – AIC followed same approach for 20-year as 5-year forecast

## Methodology – Step 1: Develop macro gas demand forecast

| AIC Rate Class | AIC Modeling Type | RB Customer Class |
|---|---|---|
| **GDS-1** – Residential Gas Delivery Service | SAE[1)] | Residential |
| **GDS-2** – Small General Gas Delivery Service | SAE[1)] | Commercial (~70%)<br>Industrial – System & Transport (~29%)<br>Public Authority (~1%) |
| **GDS-3** – Intermediate General Gas Delivery Service | Econometric | Commercial (~29%)<br>Industrial – System & Transport (~70%)<br>Public Authority (~1%) |
| **GDS-4** – Large General Gas Delivery Service | Econometric | Industrial – System & Transport |
| **GDS-5** – Seasonal Gas Delivery Service | Average | Commercial (~9%)<br>Industrial – System & Transport (~91%) |
| **GDS-6** – Inadequate Capacity Delivery Service | Average | Industrial (System & Transport) |
| **GDS-7** – Special Contract Gas Delivery Service | Average | Industrial (System & Transport) |



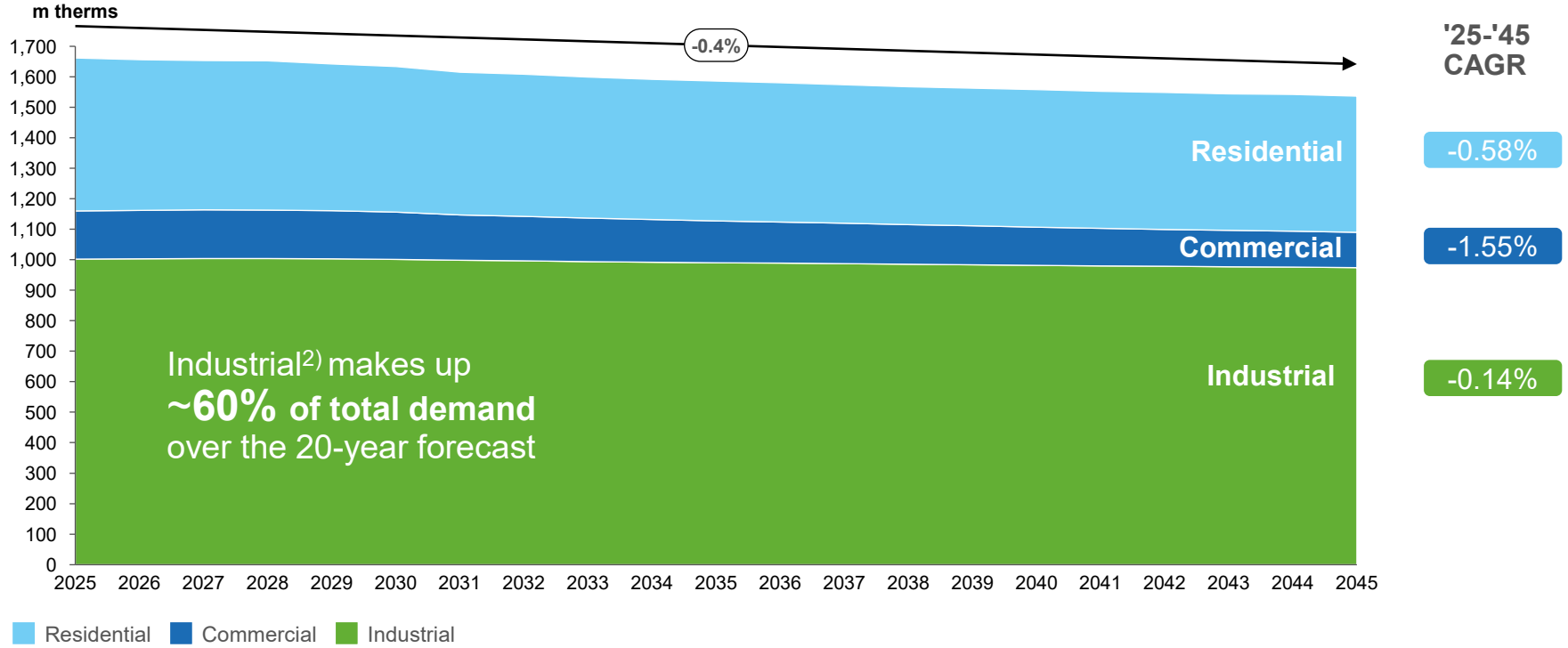

1) Statistically Adjusted End-Use

Source: AIC, Roland Berger

In-progress materials as of 11/2024: AIC base case

# AIC's gas consumption is forecasted to decline slightly through 2045 with industrial transport's share expected to be more than half of overall demand

Step 1: AIC **base case** forecasted consumption by customer segment, 2025-2045 [m therms]




'25-'45 CAGR

-0.58%

-1.55%

-0.14%

1) Includes post-model adjustments from AIC energy efficiency and economic development teams; 2) Includes Industrial Transport customers, which is a vast majority of volumes

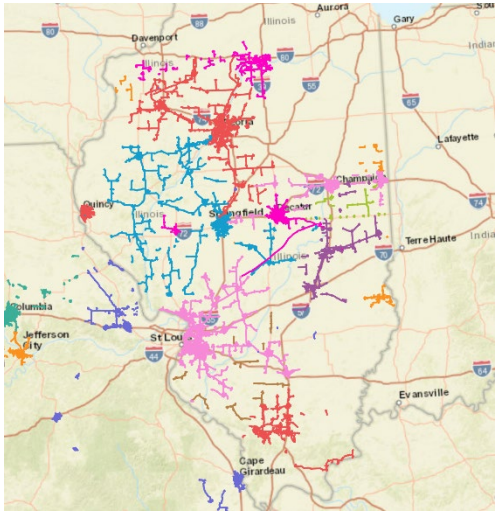
Source: AIC, Roland Berger

# AIC and RB segmented by geography and customer and integrated physical system artifacts (GUS) and operations team feedback to refine

## Methodology – Step 2: Derive local system demand forecast

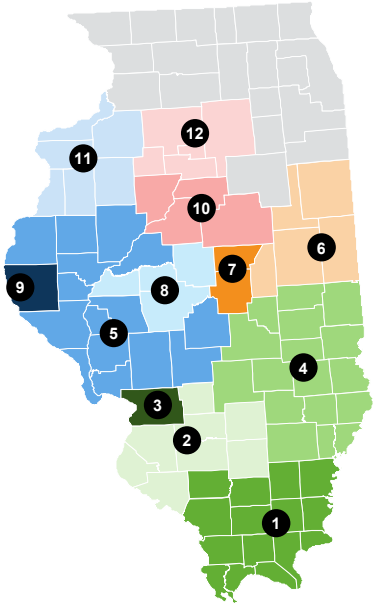
### Definition of volumes across geography within AIC territory


### ZIP-code level segmentation by physical system structure and location




- Creation of zones based on existing system structure, general flows/pathways of volume, and system operations

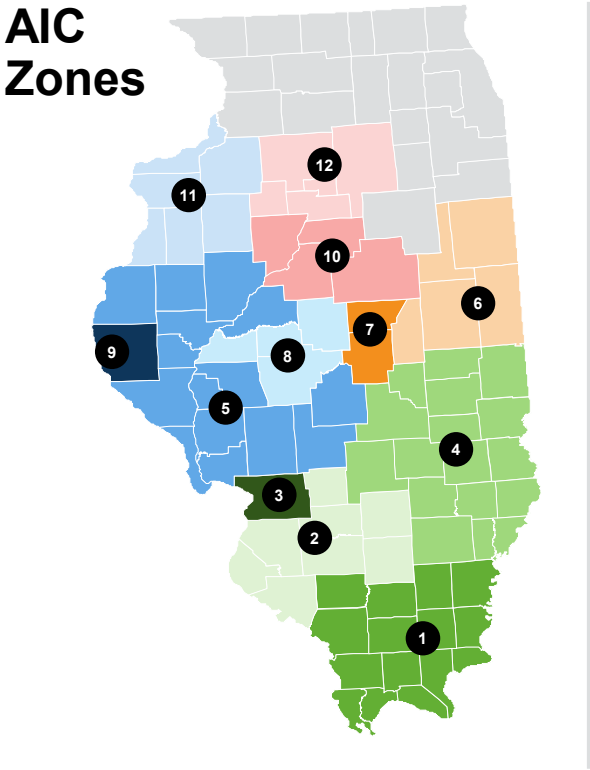
### 'Zonal' segmentation based on system operations

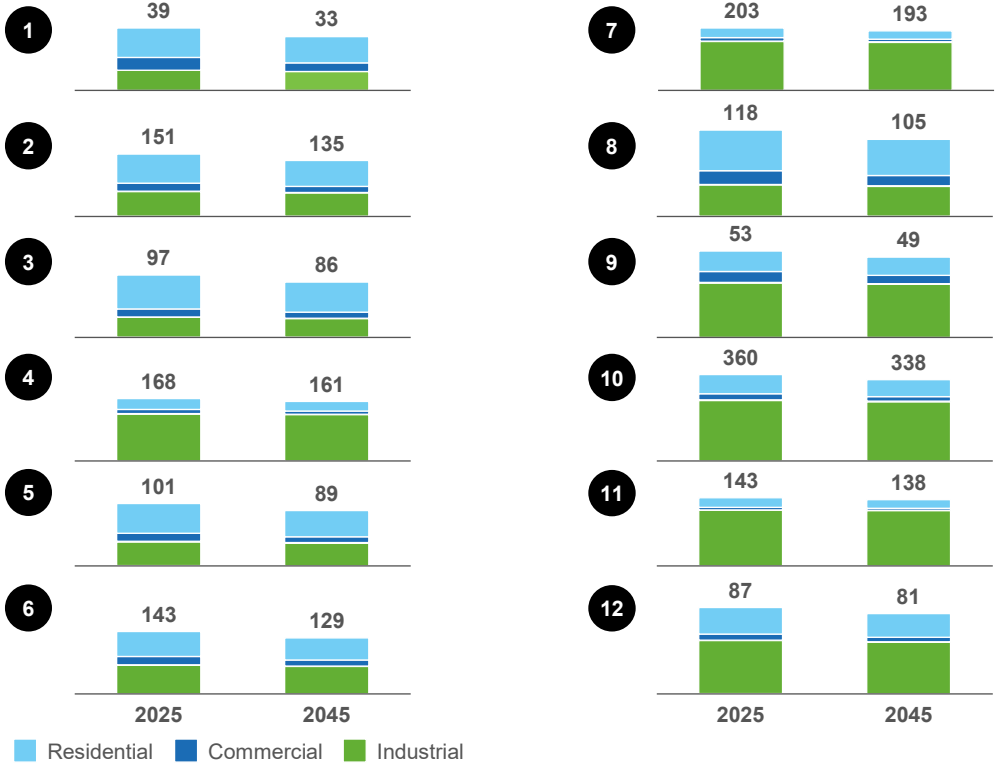


In-progress materials as of 11/2024

# When re-segmented, AIC's residential demand is still primarily in the southern and western parts of the state, with the north and east predominantly industrial

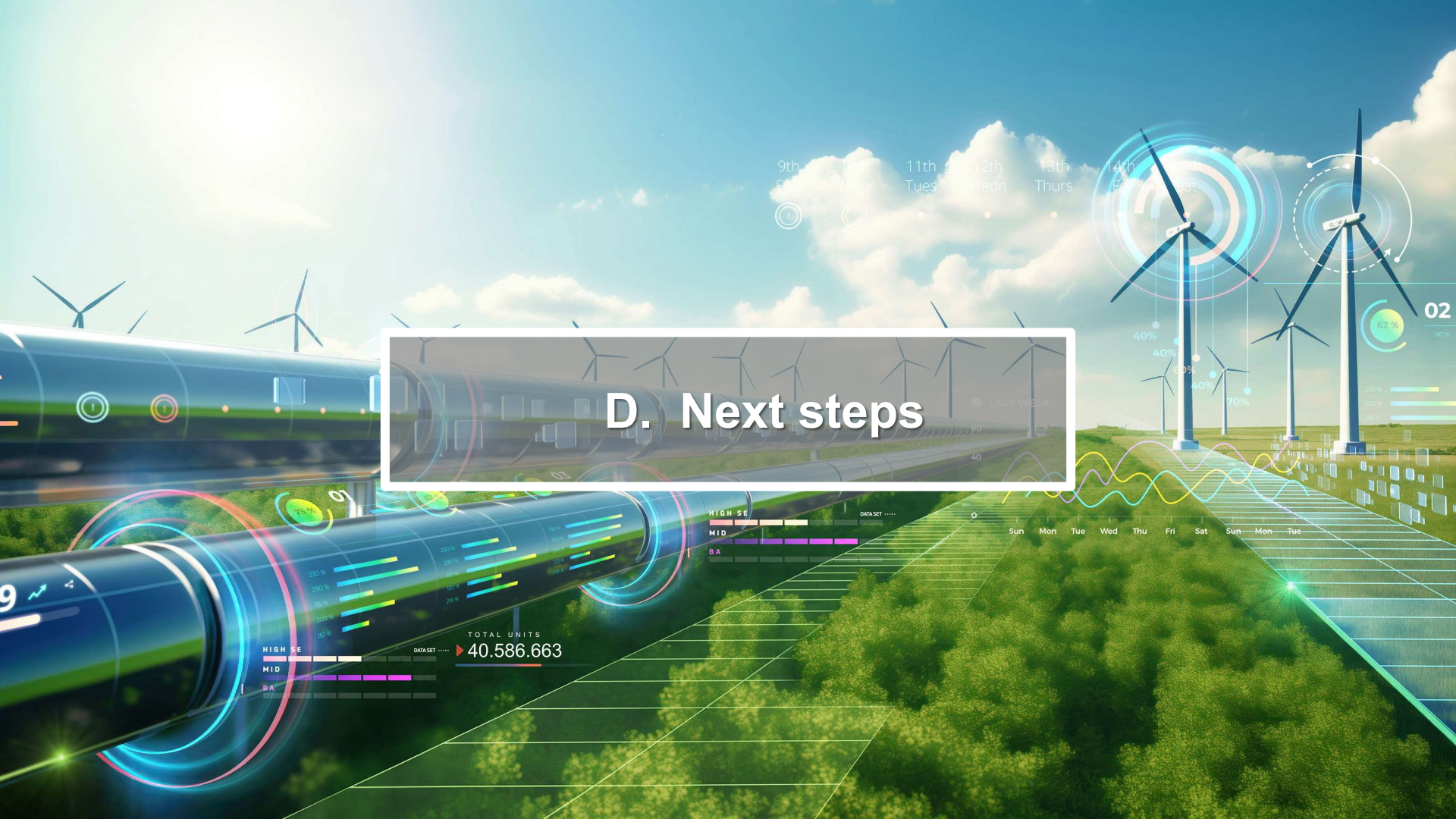
## Step 2: AIC local forecasted gas demand by customer segment, 2025-2045 [m therms][1,2)




1) Does not consider Sales to Public Authority; 2) Total figures may differ slightly due to rounding

Source: AIC, Roland Berger


D. Next steps
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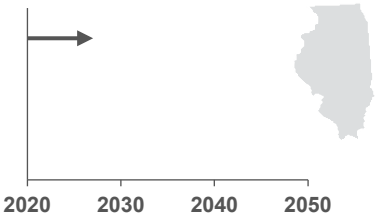
# Over the next few months, AIC will work towards integrating a scenario-based view of gas demand to use as an input to infrastructure planning

## Next steps for the gas demand forecast (1/2)

In focus for next workshop

### 0 Annual volumetric gas forecast

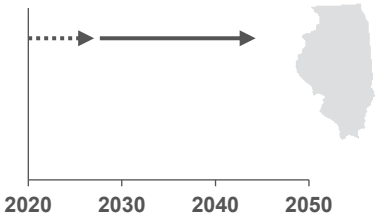
Develop annual 5-year forecast




- Conducted as a part of annual planning by customer class

### 1 Develop 20-year gas consumption forecast

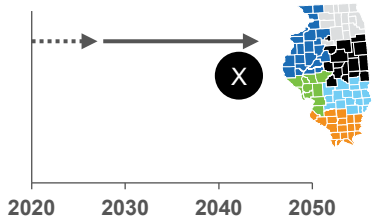
Develop 20-year forecast




- Develop 20-year forecast based on similar methodology as 5-year approach today
  - Consider economic/customer growth, climate change, etc.
  - Business-as-usual considerations for energy efficiency and economic dev.

### 2 Derive local system demand forecast

Derive top-down local demand based on system boundaries

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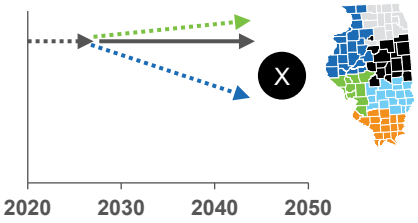
  - Demographics

### 3 Integrate scenarios

Assess each local segment's development across scenarios

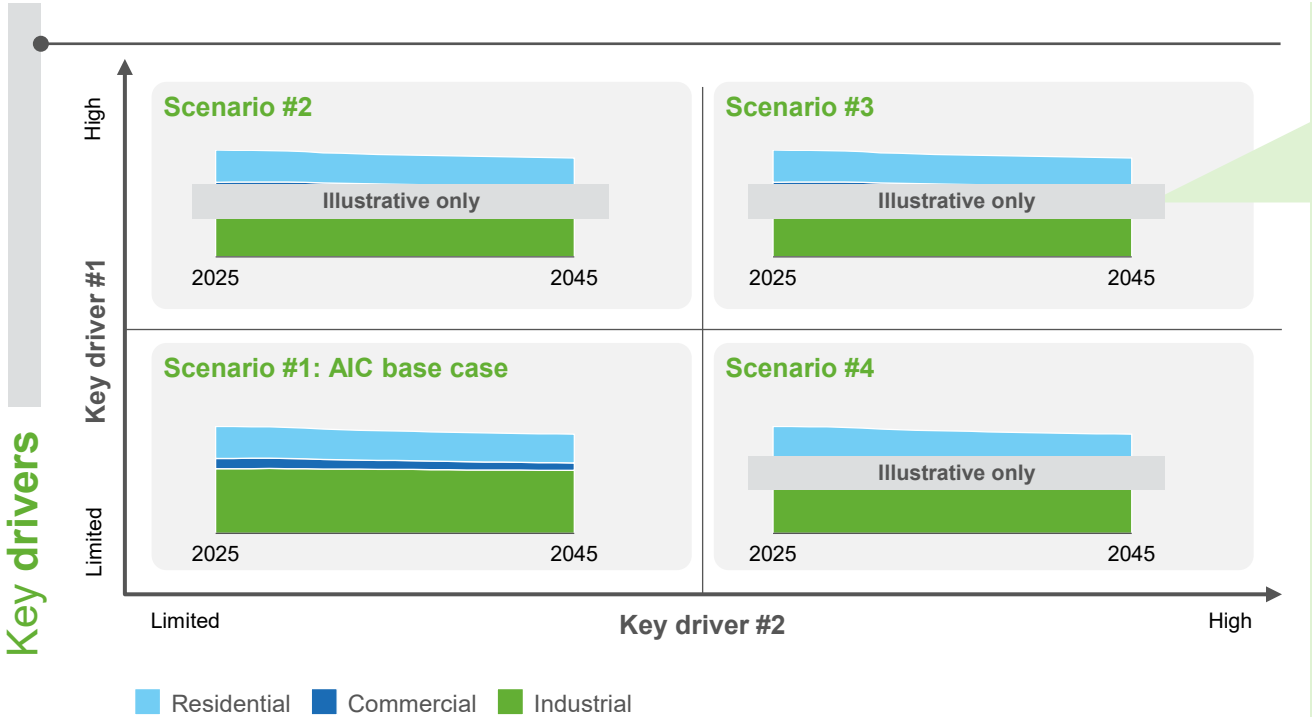


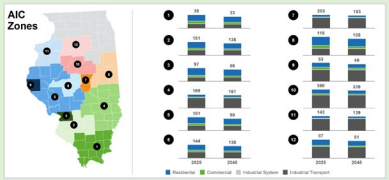

- Integrate scenarios at the semi-local level where possible linked to identifiable differences in :
  - End use efficiency
  - Fuel augmentation
  - Load switching
  - Utility demand

# The integrated scenario analysis will depict four potential possible futures, each with their own distinct developments and localized point of view

## Next steps for the gas demand forecast (2/2)

**Illustrative results only**




- ✓ Local assumptions and outcomes unique to the scenario
- ✓ 'Mile-markers' to highlight when the possible future may be most likely

# The select scenarios will be derived from the key drivers and discernable variations in the levers underpinning the different plausible futures

Key drivers and levers for scenario integration

## Foundational objectives

- Affordability
- Reliability
- Safety
- Resilience
- Equity

## Key drivers

### Decarb. Policy Coordination

**Policy regimes that focus on 'correct' order of operations for decarbonization**

- No regrets efficiency investments as a first step towards decarbonization
- Bill affordability focus
- Alternative fuel deployment in ideal sequence and economy sectors

### Economic growth

**Economic growth and development across scenarios, including**

- Reindustrialization of Illinois through various federal and state efforts
- Considerations for impacts of growth to both the electric and gas grids

## Levers

### Tech deployment and costs

End-use technology availability & cost development

### Customer choice

Consumer choice and affordability frictions to adoption of new tech absent regulation

### Electric and gas price development

Impact of power & fuel prices on technology adoption

### Subsidies & Rebates

Government or utility subsidies/ rebates of decarbonization technologies (e.g., heat pumps)

### RNG & H2 availability

Availability and price of low carbon alternative fuels

### Efficiency measure deployment

Acceleration and magnitude of efficiency measures, e.g., retrofits

+ others


E. Q&A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ILLINOIS