GPCM Workshop: Demand

November 21, 2025

The Leader in Energy Market Simulation Systems

Providing energy companies, consultants, and regulators advanced tools to support:

- **Investment and M&A Strategy**
- **Environmental and Sustainability Goals**
- **Credible Risk Analysis**
- **Trading Strategy**
- **Policy Development and Assessment**
- **Energy Security**

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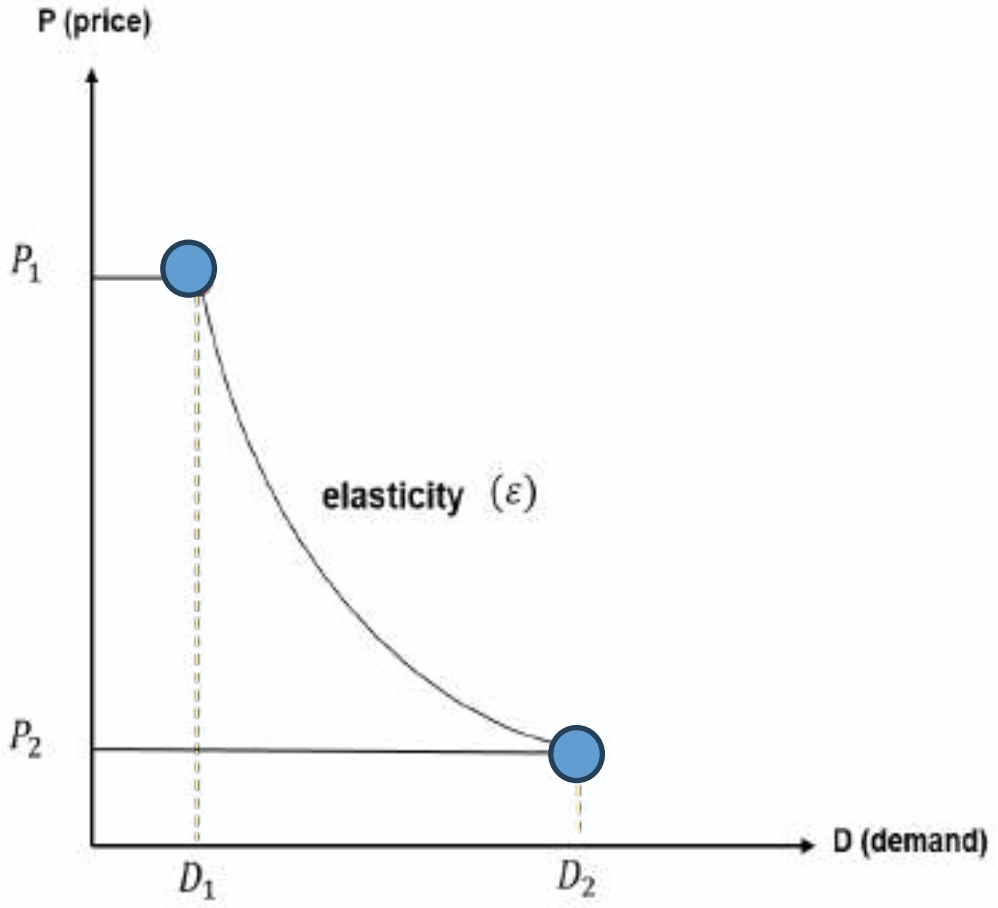
RBAC's Demand Curve Development Methodology

Demand Curve Development

U.S. & Canada RES, COM & IND	• Use regression-based forecasting through GDMS
U.S. & Canada ELC	• ELC demand curves (midpoint demand) directly put in Builder • Base Case uses modified NERC forecast & CER Forecast
Mexico RES, COM, IND & ELC	• SENER Forecasts through mid-2030s • Trend analysis for period after forecast



Demand Regressions Constructed by STATE and SECTOR

$$y = f(x_1, x_2, x_3, \ldots x_n) + \delta$$

- y: dependent variable
- $f(x_1, x_2, x_3, \ldots x_n)$: independent driver variables
- δ: unexplained error

$$\text{Demand} = \alpha \cdot x_1^{\varepsilon_1} \cdot x_2^{\varepsilon_2} \cdot x_3^{\varepsilon_3}$$

elasticity

- α: constant
- x_1: price
- x_2: Weather
- x_3: market size / growth *(e.g., population, customer count, GDP, GSP)*

Driver Variables, Constant Terms, and Elasticities Vary

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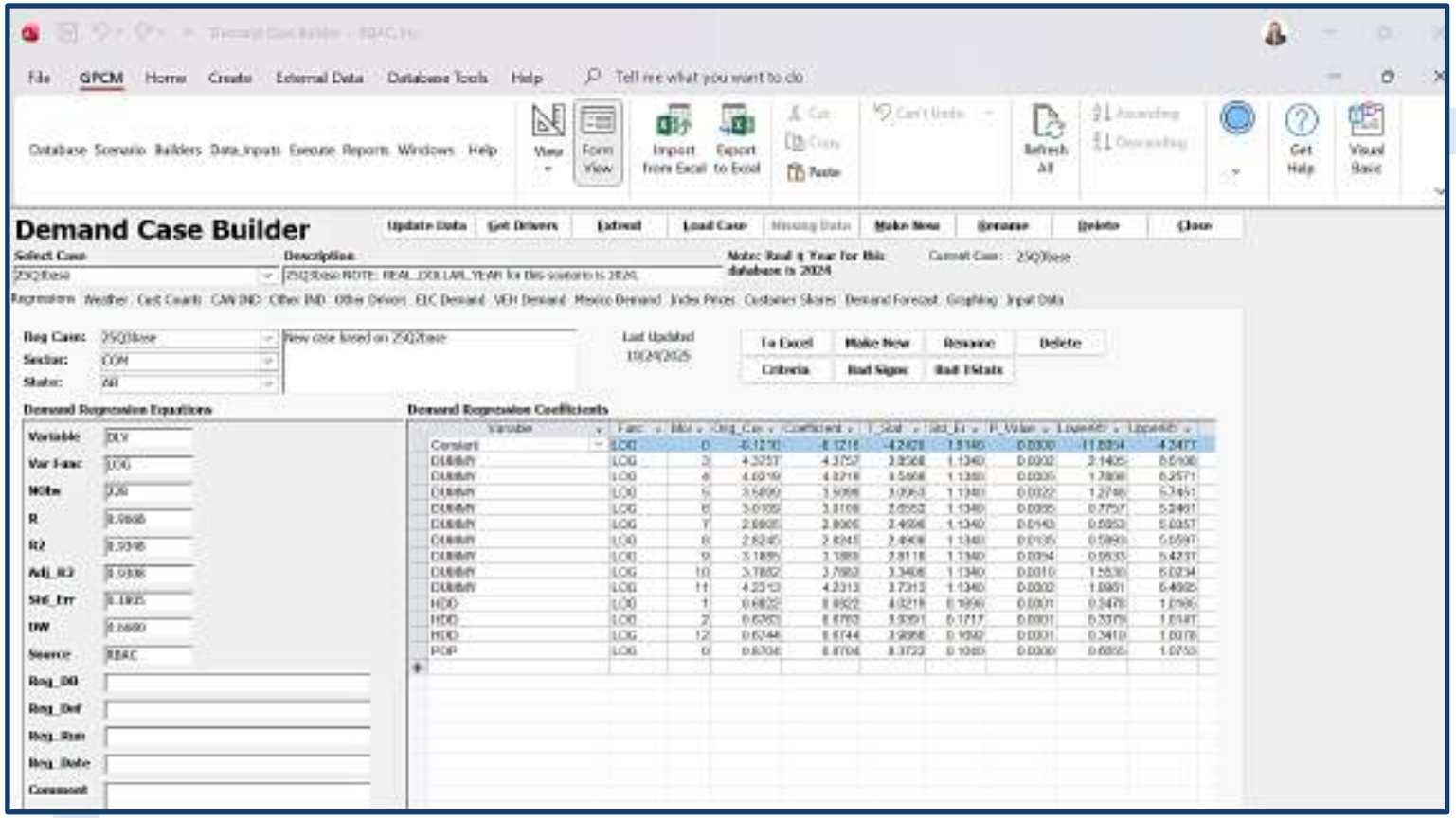
Demand Case Builder & Demand Make New

Demand Case Builder & Demand Make New

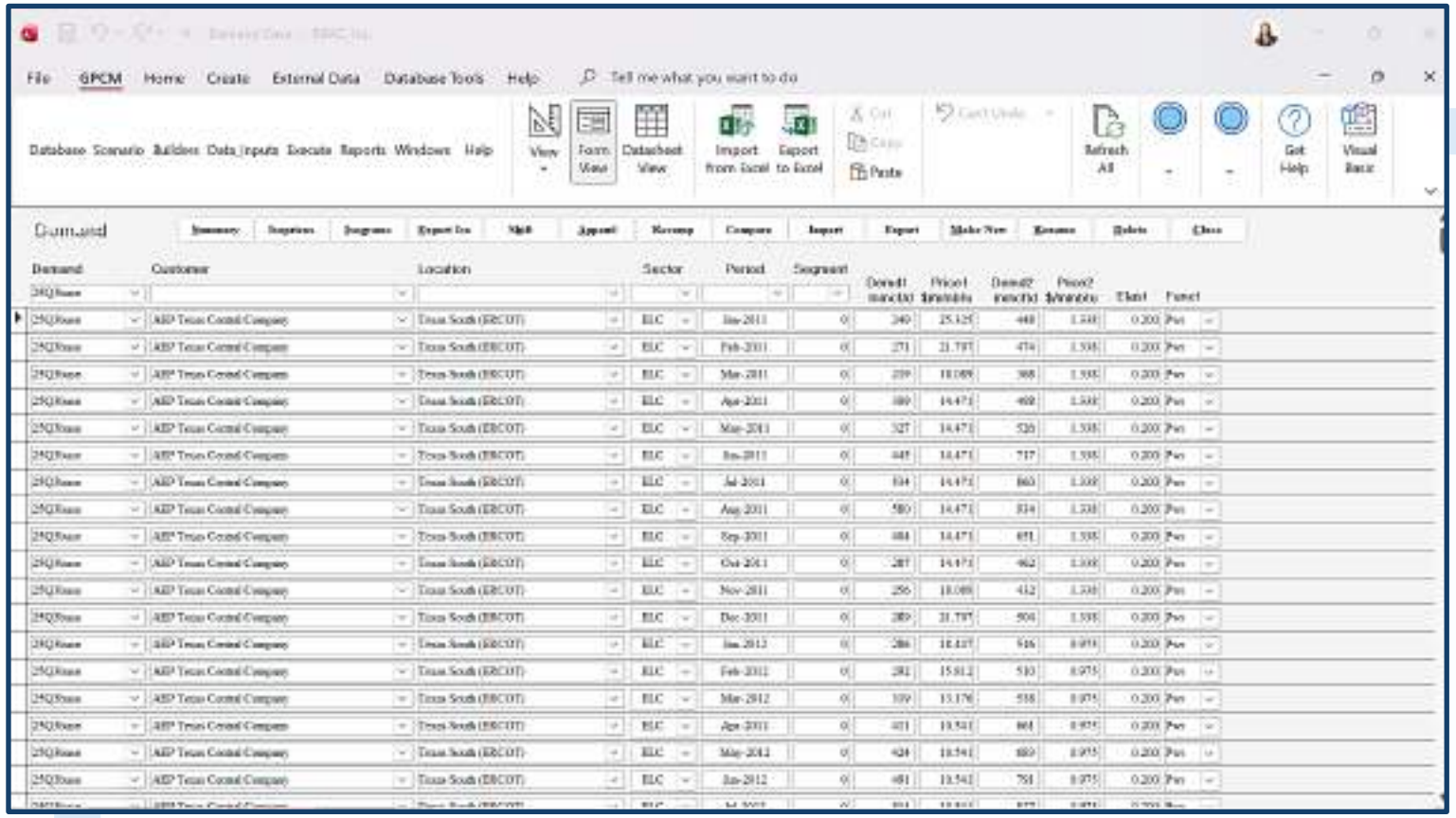


Control Panel -> Builders -> Demand Case Builder

Use DEMAND CASE BUILDER:

- Change macro level factors
- Change electric Demand

Demand Case Builder & Demand Make New



Control Panel -> Data Input -> Demand Model -> Demand Cures -> Make New

Use DEMAND MAKE NEW:

- Change demand by a multiple or absolute value for:
  - o Sector
  - o Time period
  - o Geography
  - o Quantity or Price

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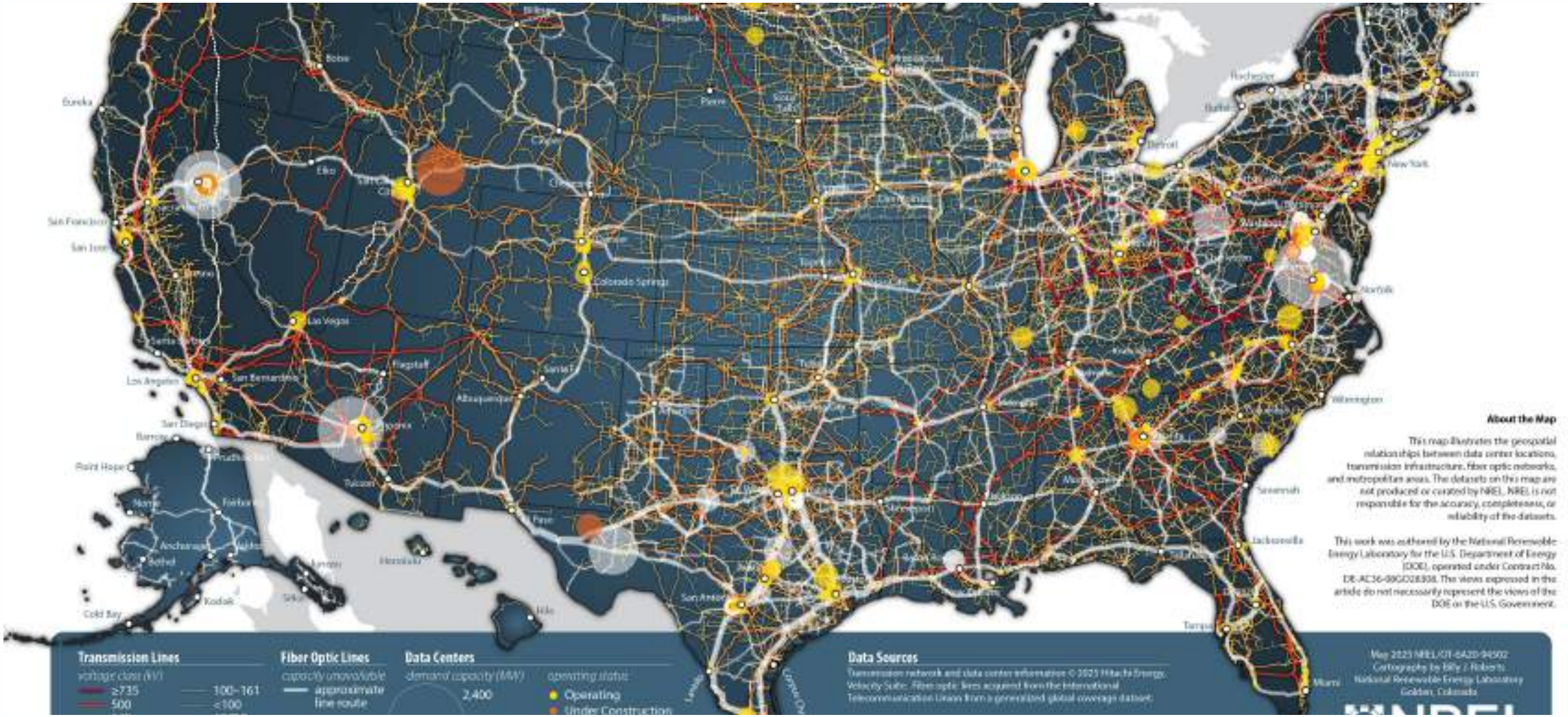
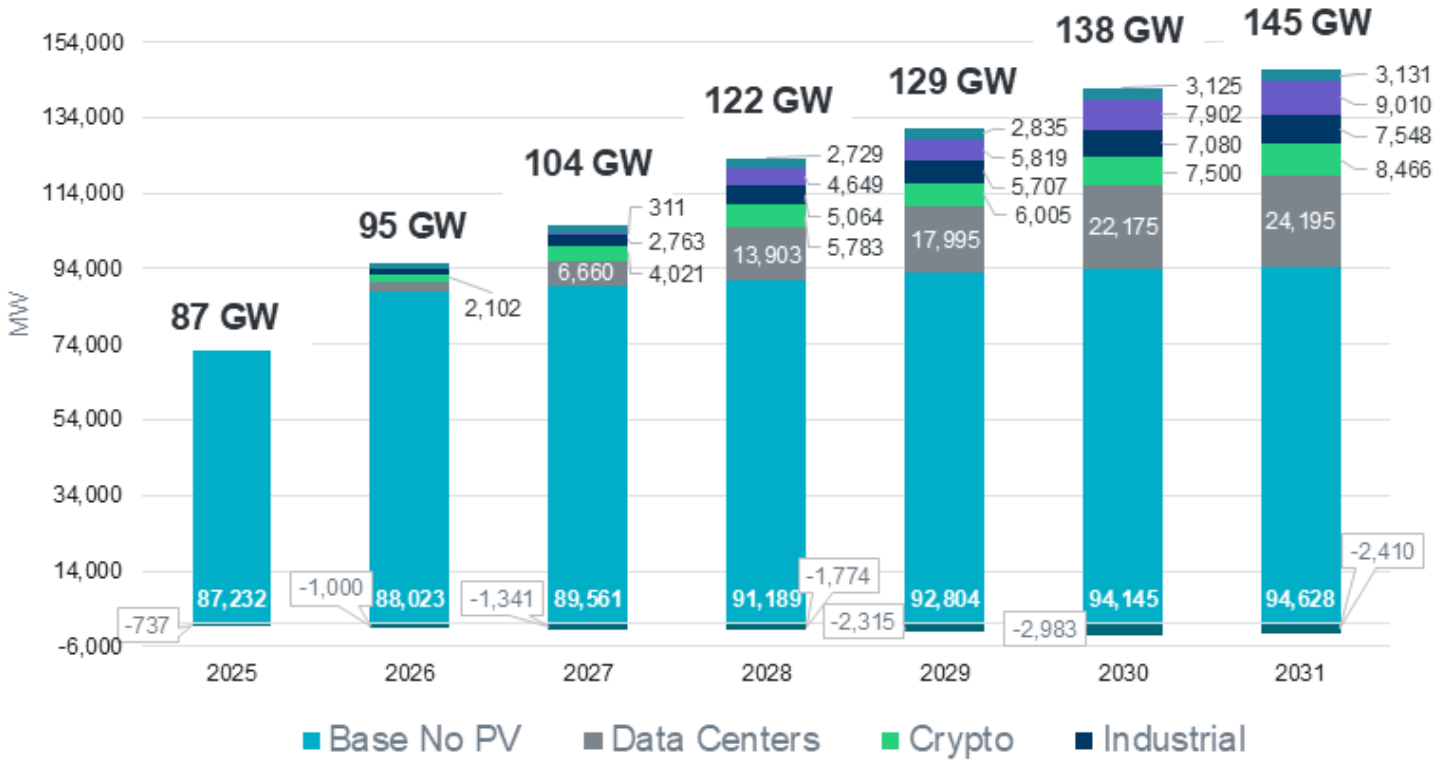
Practice Scenario – Increasing Electric Demand in Texas due to Data Centers

Data Center Demand



Texas Data Center Demand



	2025	2026	2027	2028	2029	2030	2031
Data Centers	0	2,433	6,660	13903.35	17,995	22,175	24,195
Crypto	0	2,102	4,021	5782.964	6,005	7,500	8,466
Industrial	0	1,387	2,763	5064.178	5,707	7,080	7,548
Hydrogen	0	5	311	4649.1	5,819	7,902	9,010
Oil and Gas	0	1,699	2,320	2728.529	2,835	3,125	3,131
PV	-737	-1,000	-1,341	-1773.73	-2,315	-2,983	-2,410

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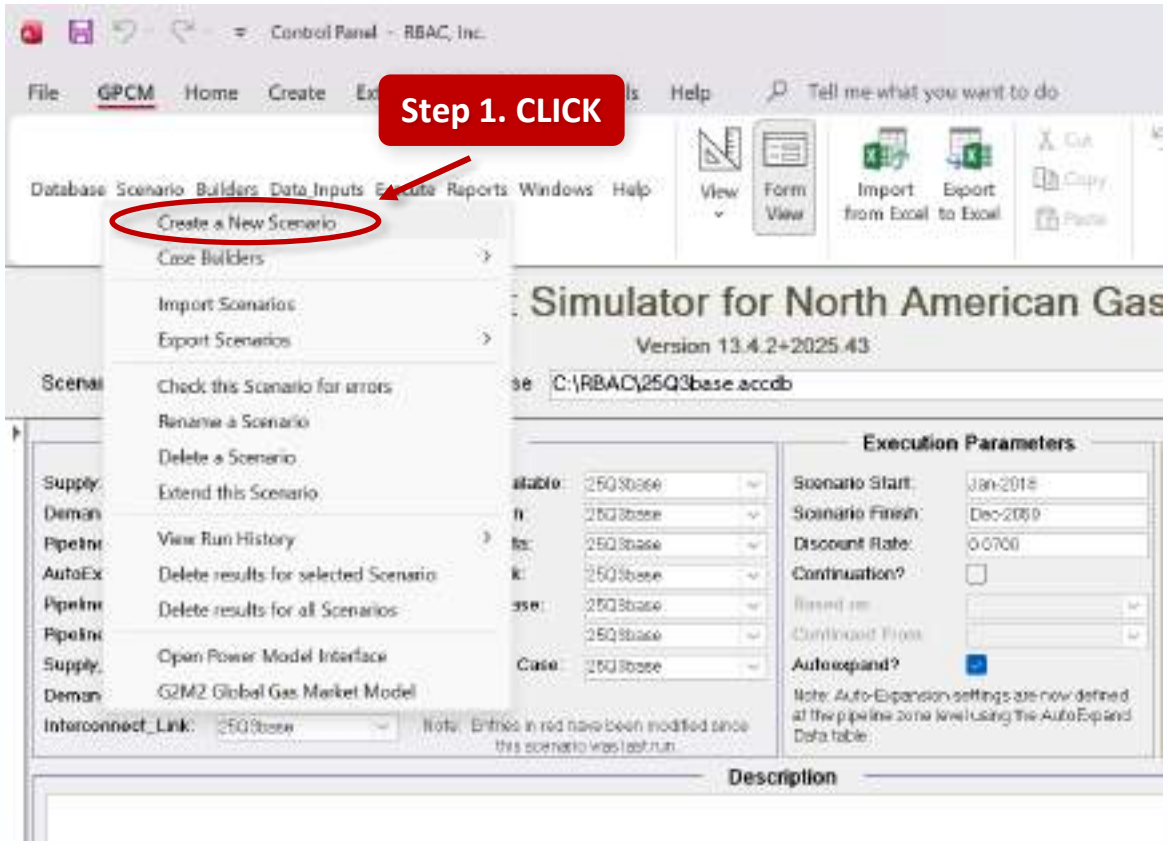
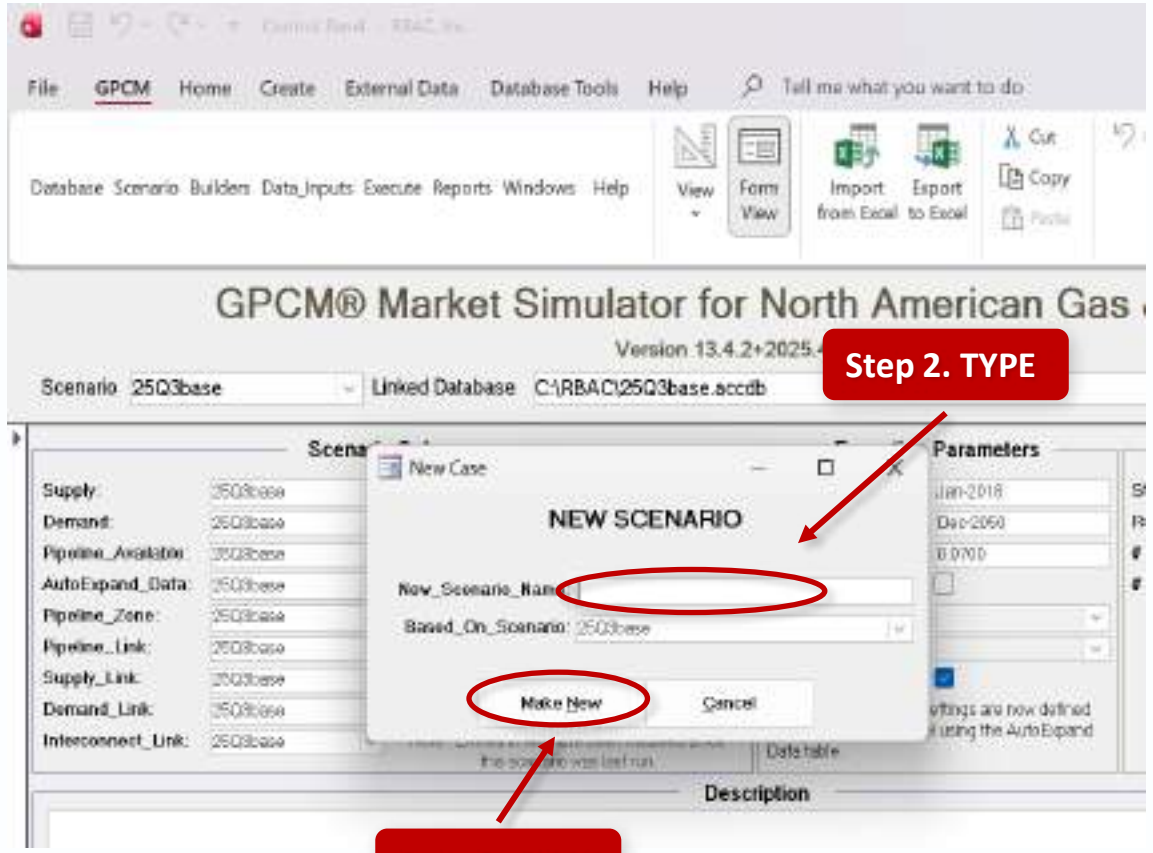
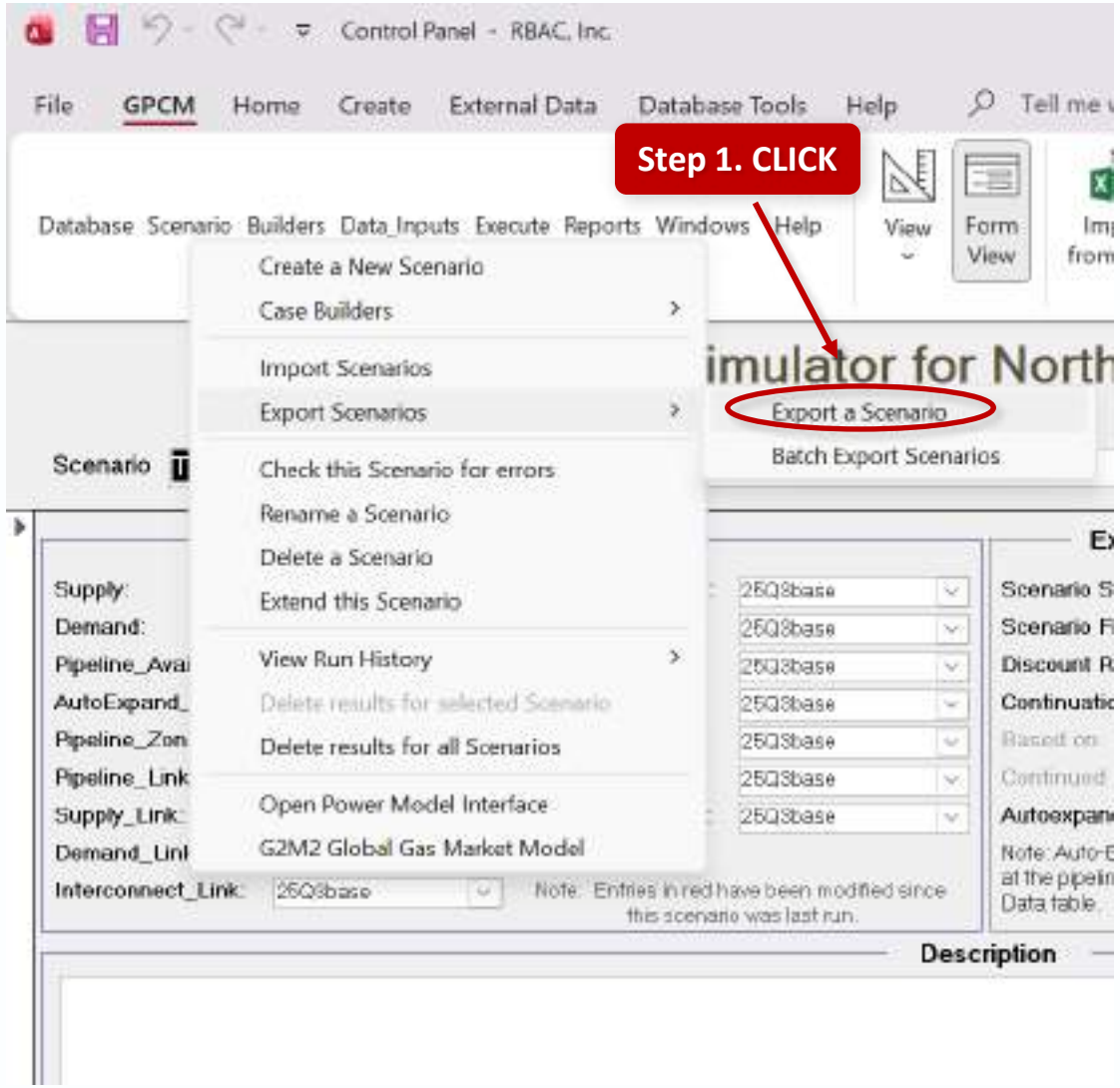
Part 1: Create a New Scenario Based on 25Q3 Base and Export into Split Database

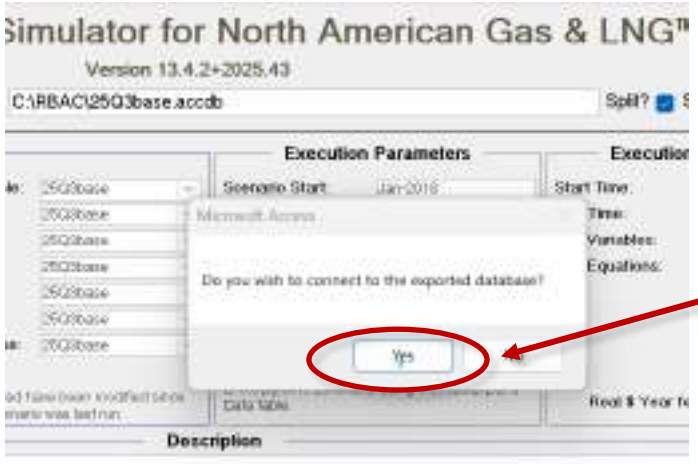
Step 1 – Create New Scenario





Step 2 – Export and Connect to New Scenario





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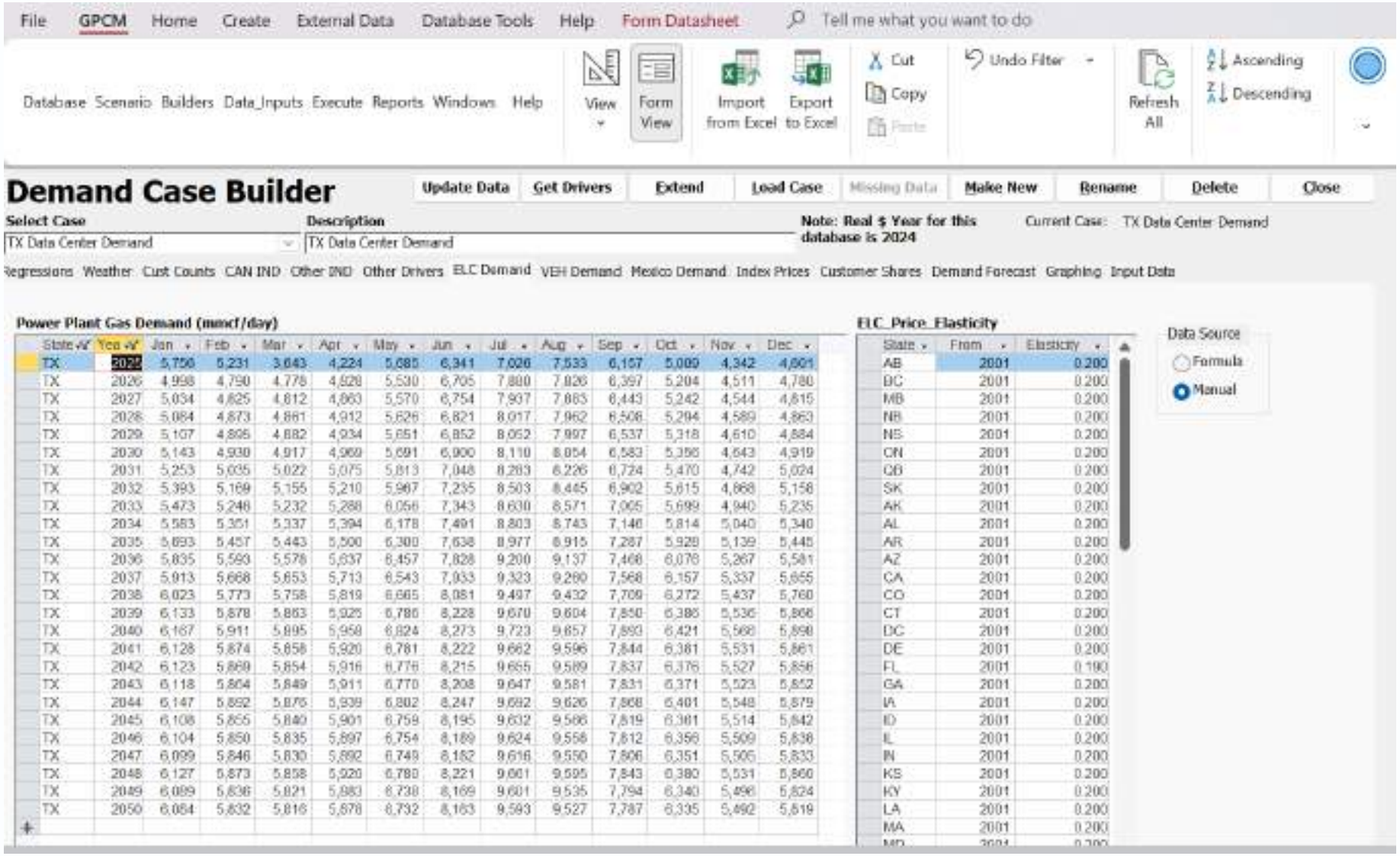
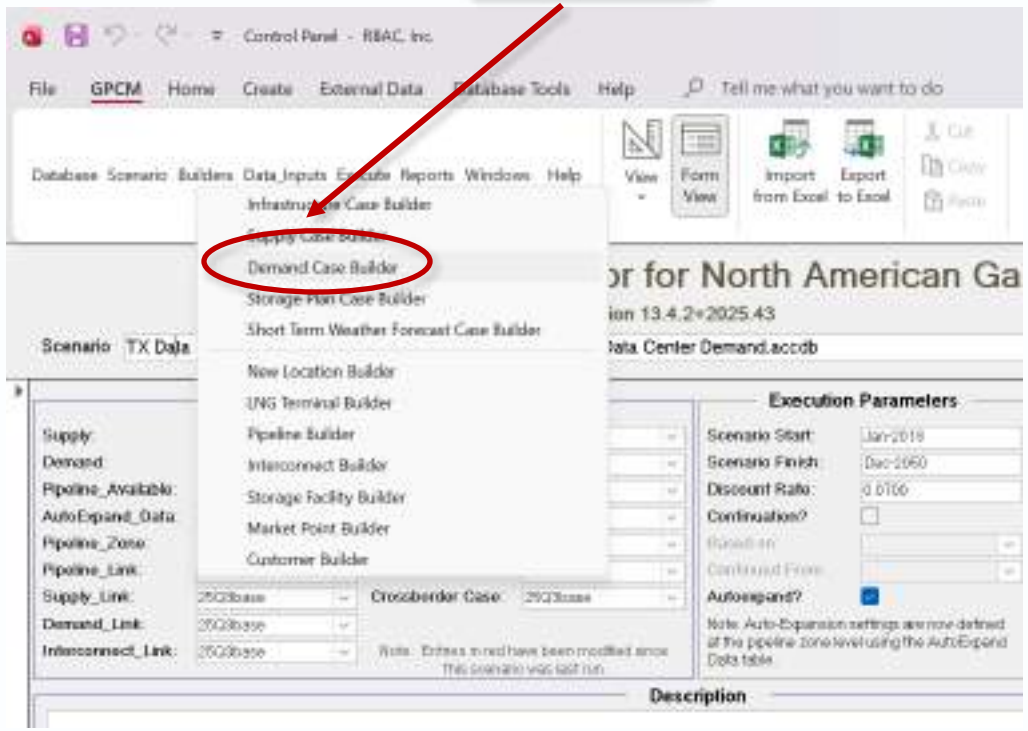
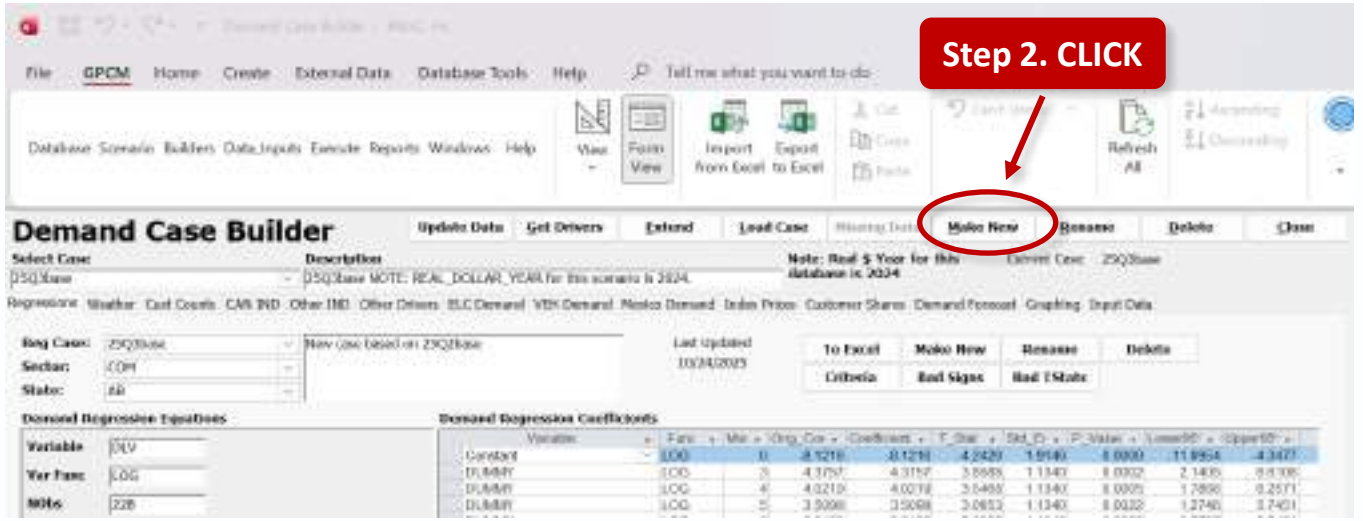
Part 2: Create Demand Scenarios using Demand Case Builder

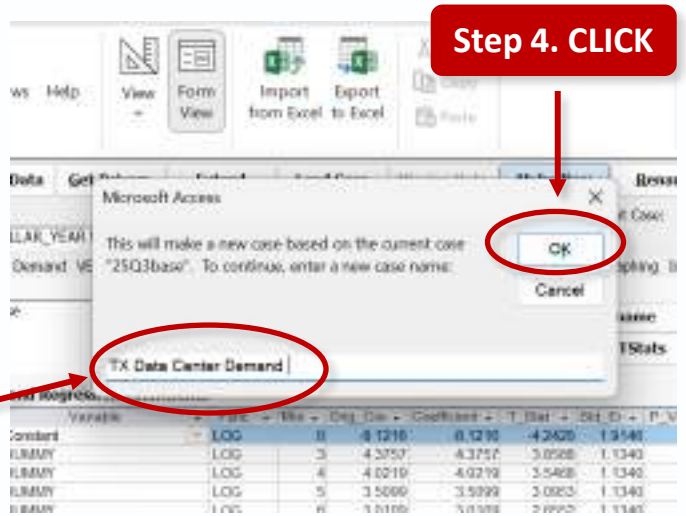
Demand Case Builder 101

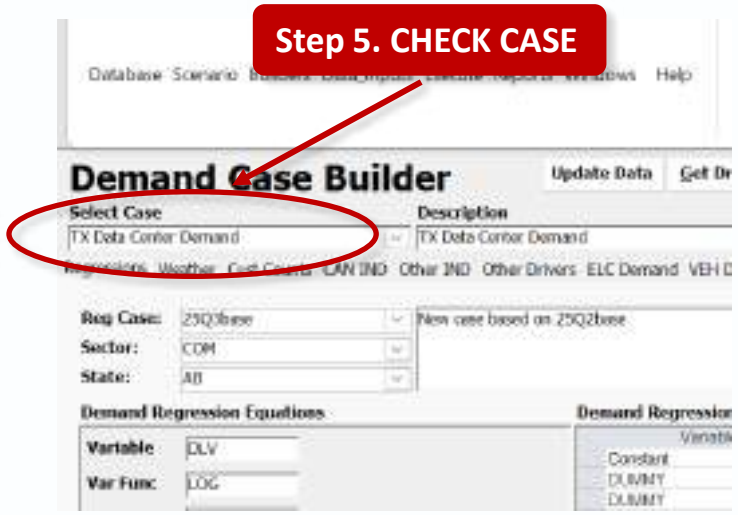


Step 1 – Make New Demand Case

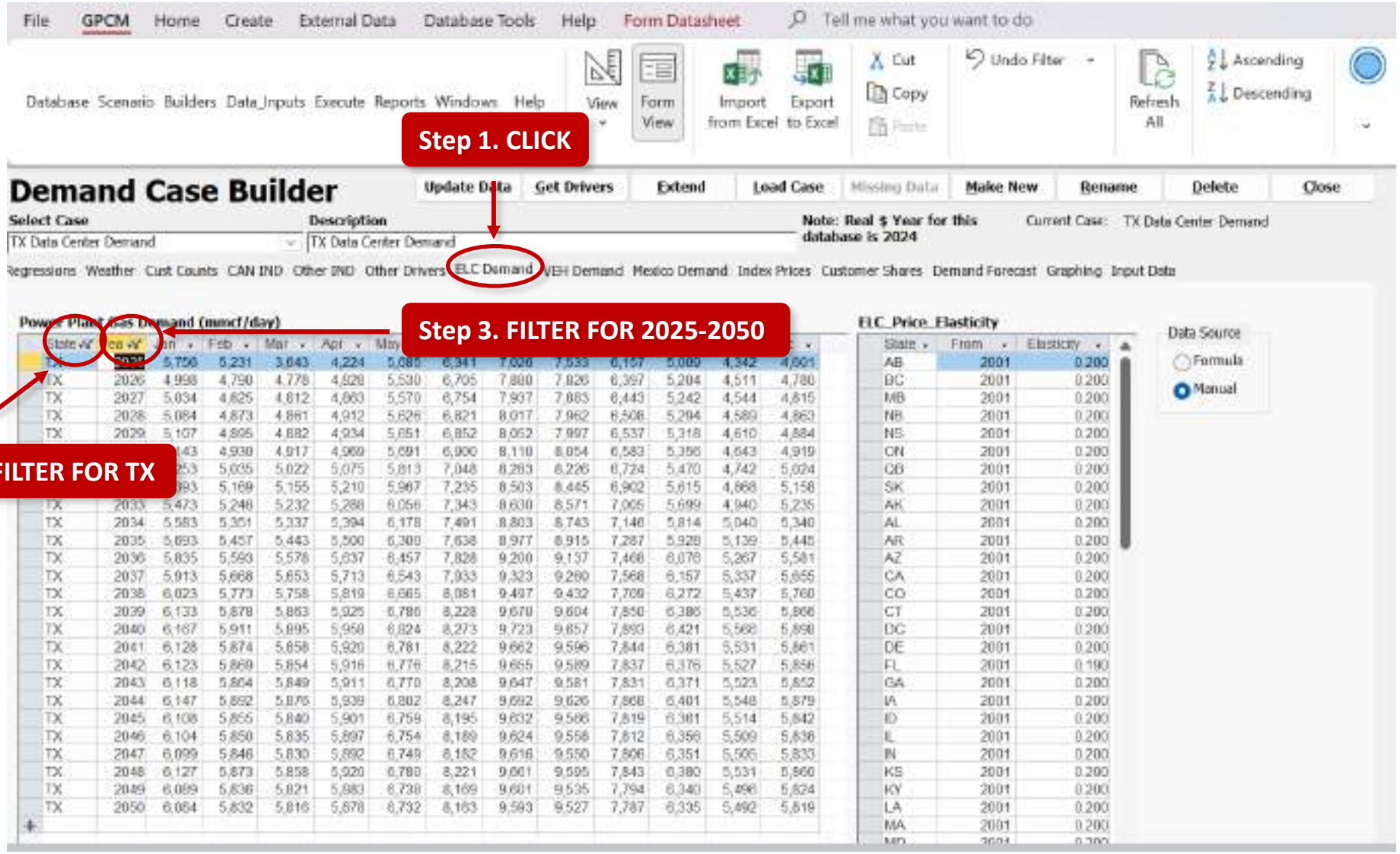




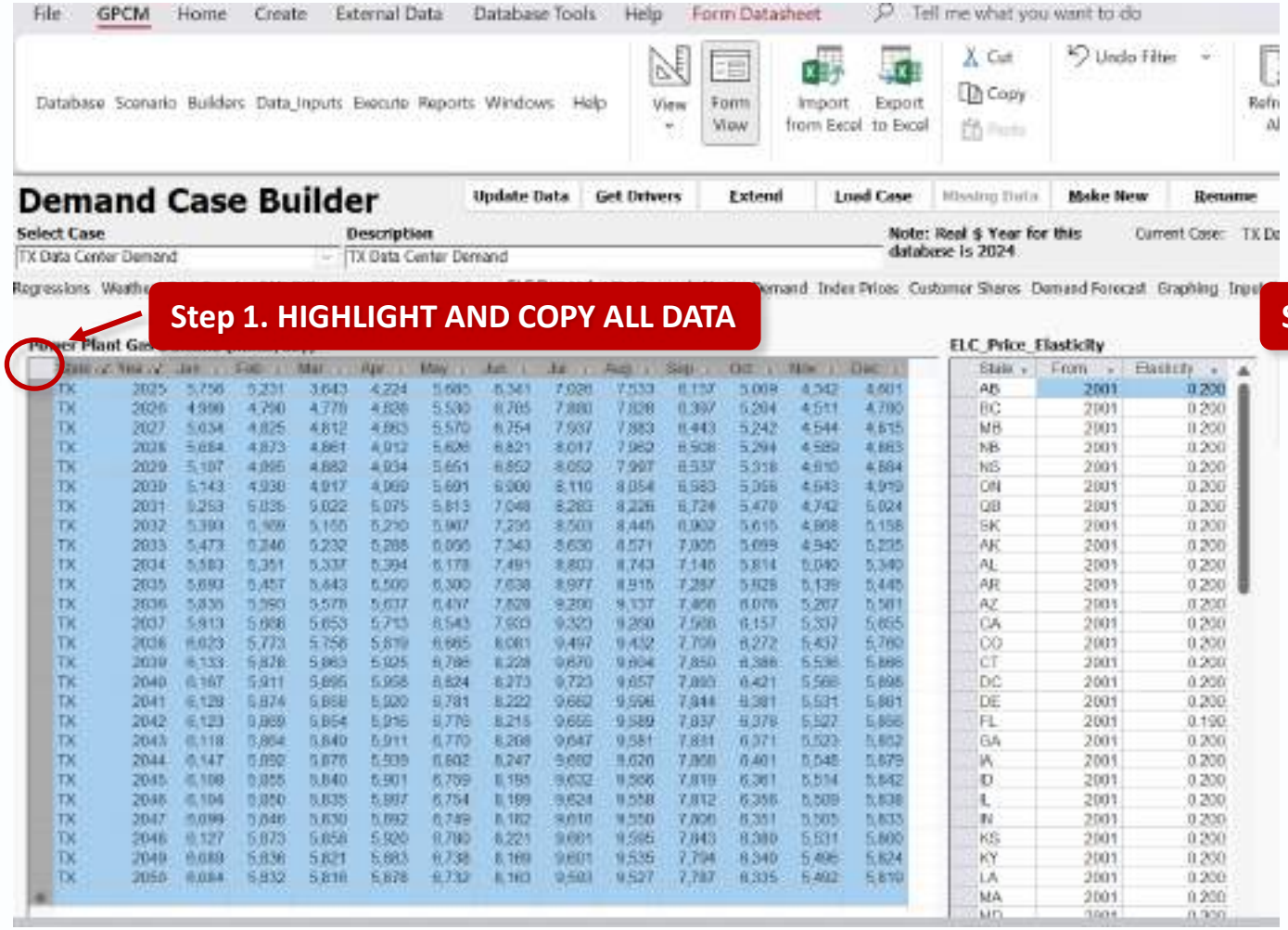


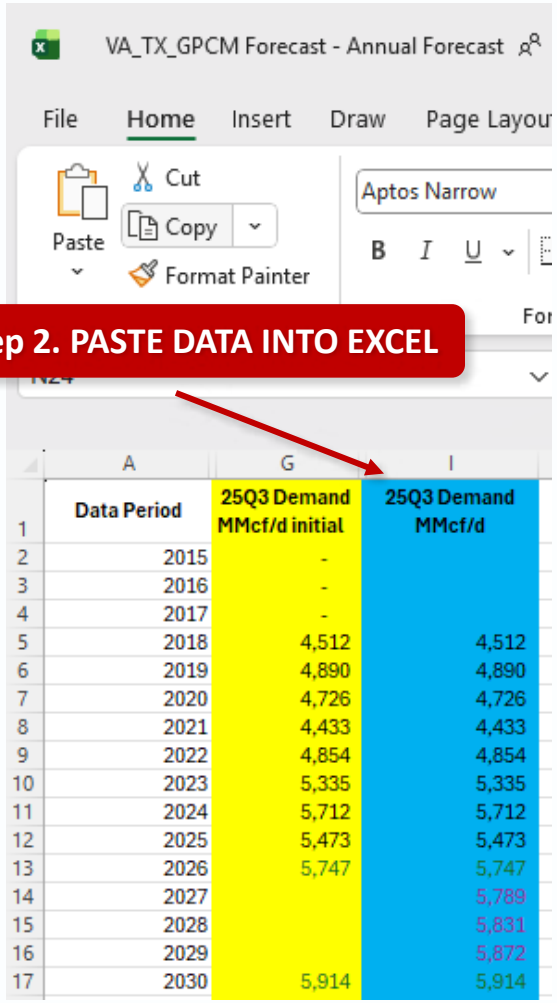


Step 2 – Filter Data



Step 3 – Select & Copy Data





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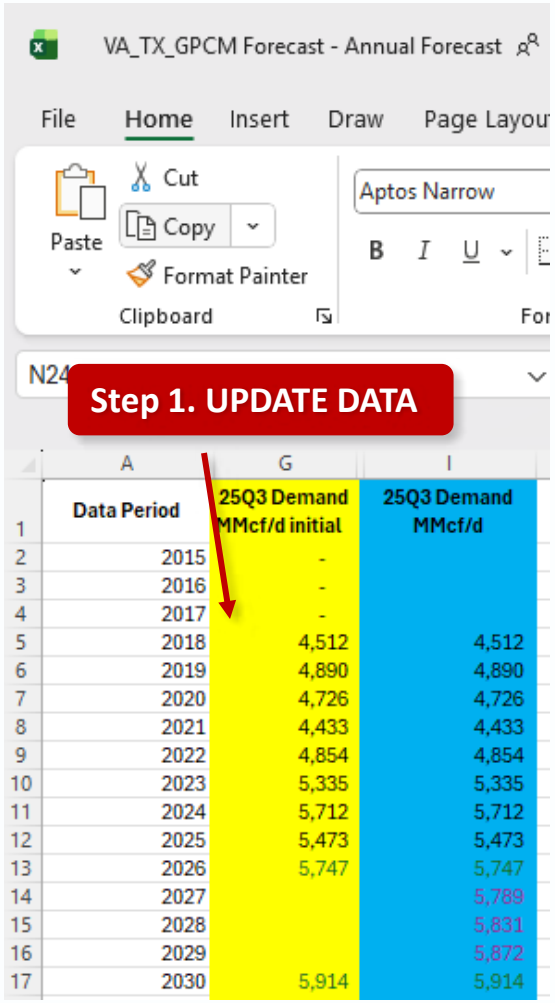
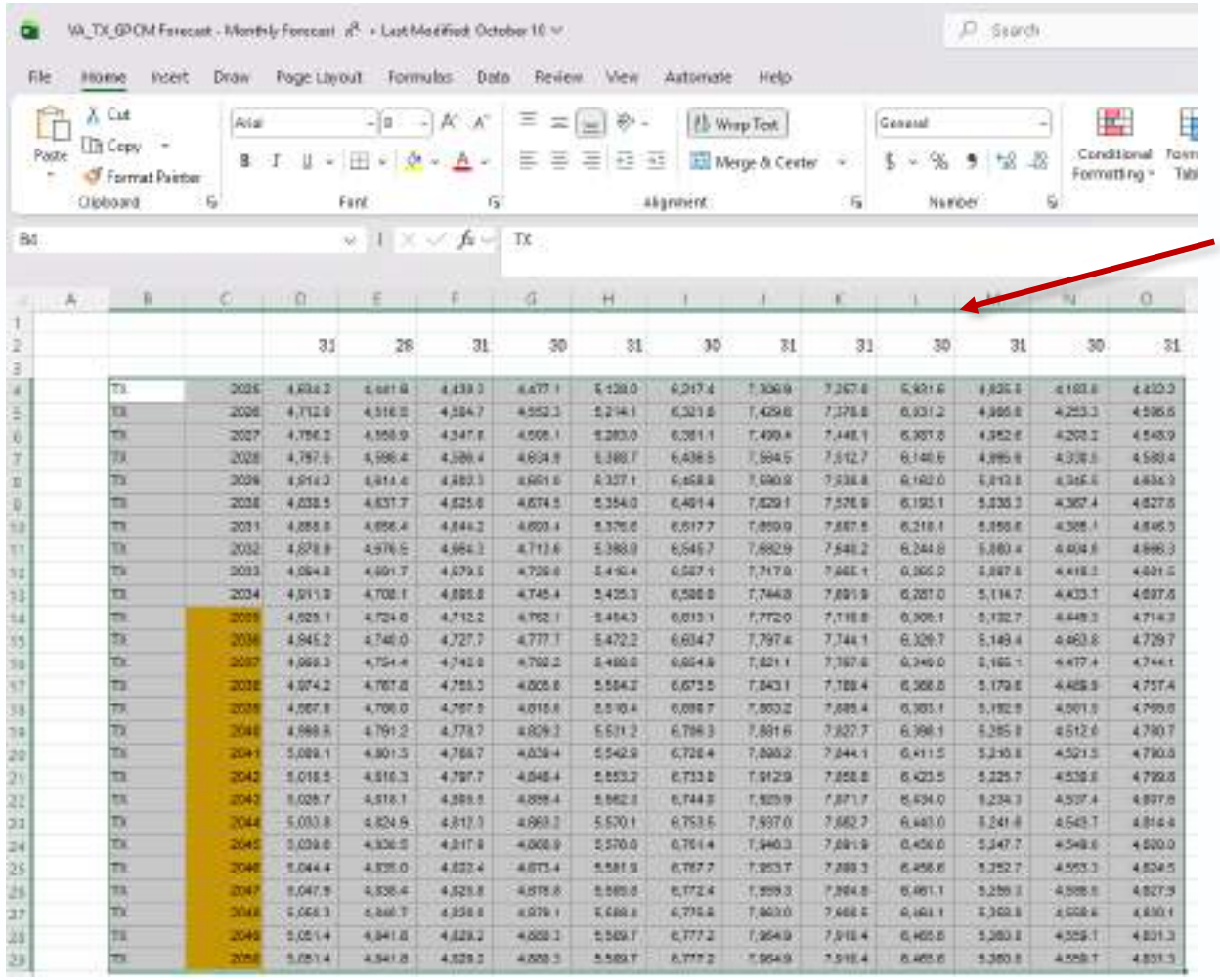
Part 2: Update Data in the Demand Case Builder

Step 1 – Update Data



	A	G	I
1	Data Period	25Q3 Demand MMcf/d initial	25Q3 Demand MMcf/d
2	2015	-	
3	2016	-	
4	2017	-	
5	2018	4,512	4,512
6	2019	4,890	4,890
7	2020	4,726	4,726
8	2021	4,433	4,433
9	2022	4,854	4,854
10	2023	5,335	5,335
11	2024	5,712	5,712
12	2025	5,473	5,473
13	2026	5,747	5,747
14	2027		5,789
15	2028		5,831
16	2029		5,872
17	2030	5,914	5,914

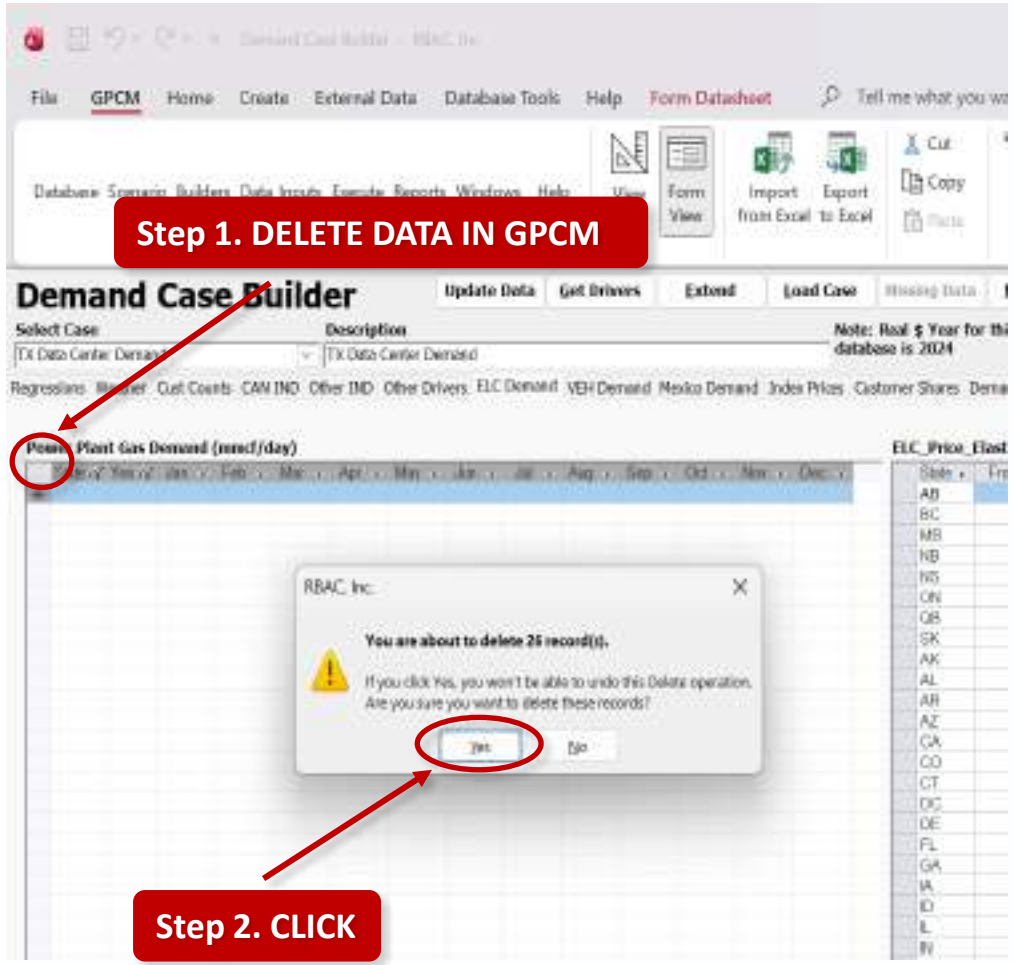


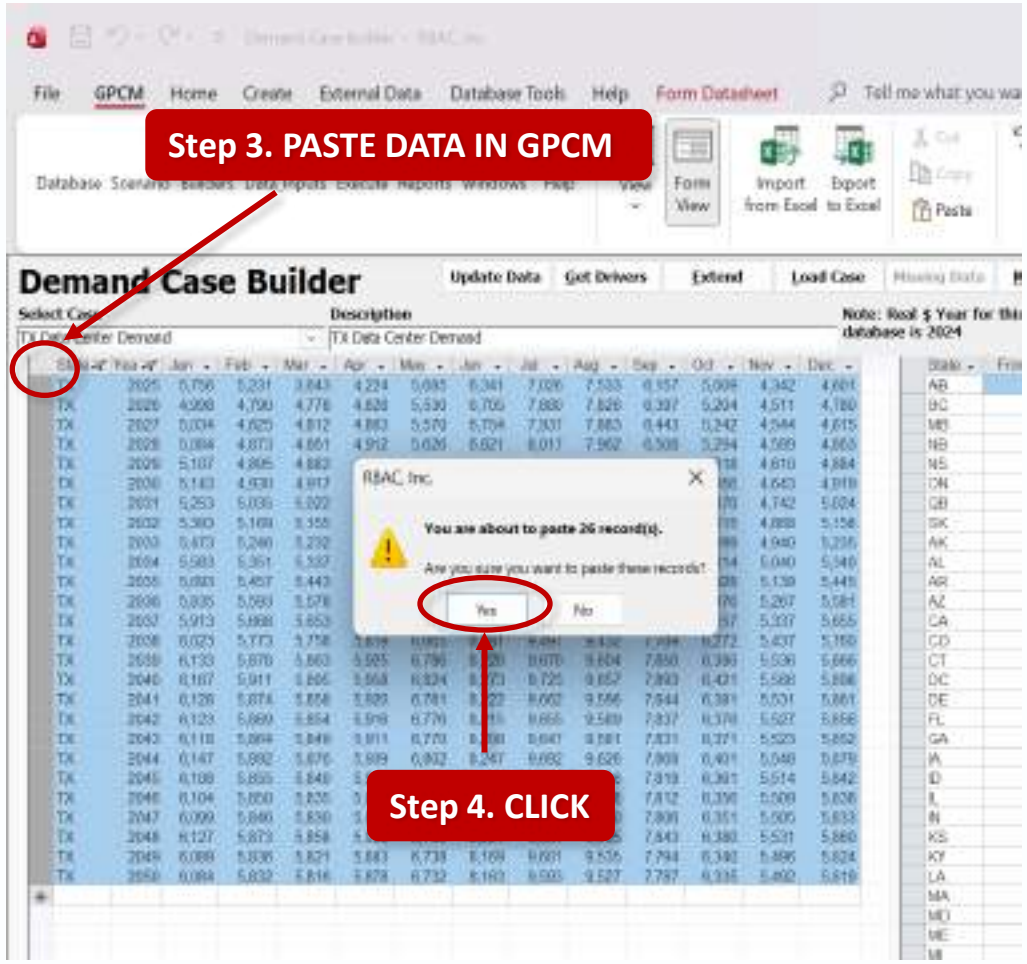
Step 2. COPY DATA FROM EXCEL

Tips:

1. **Make sure data is in MMcf/d by month**
2. **Do NOT copy a header row**

Step 2 – Input Data into GPCM





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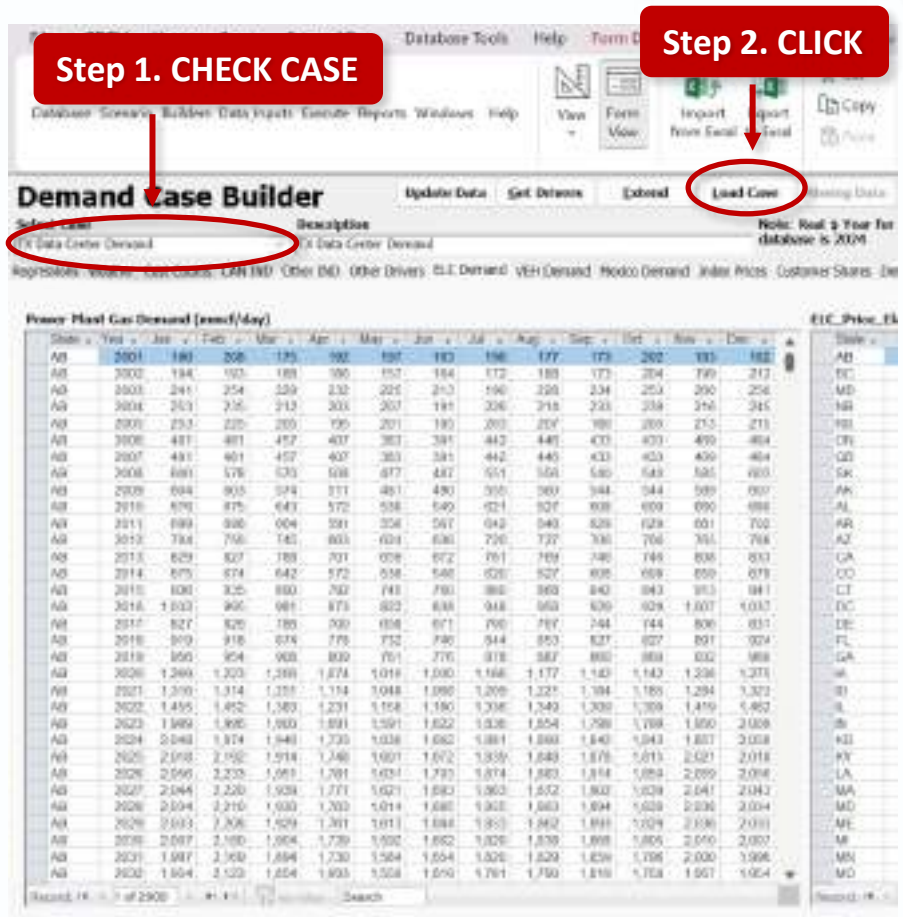
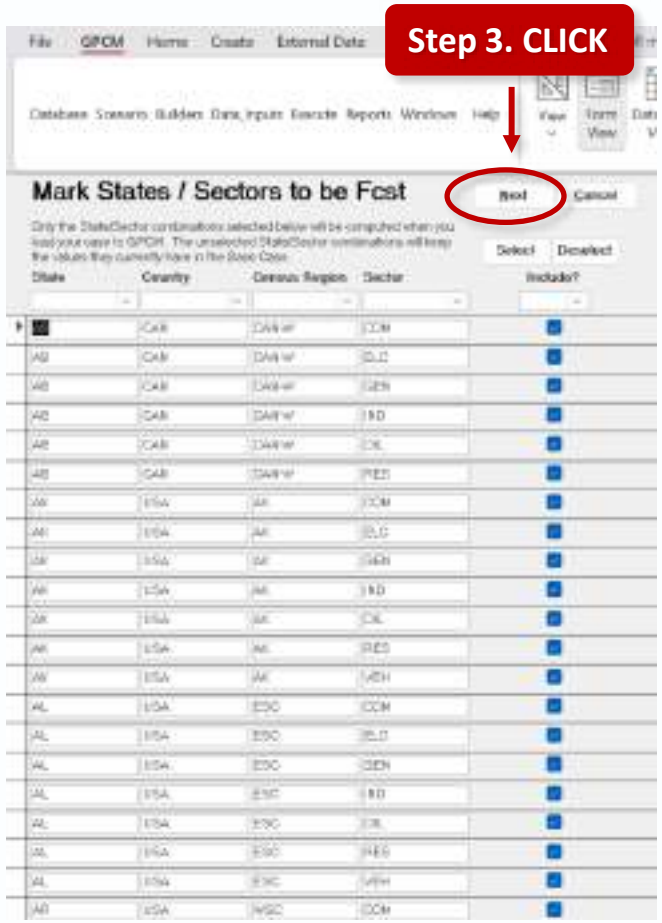
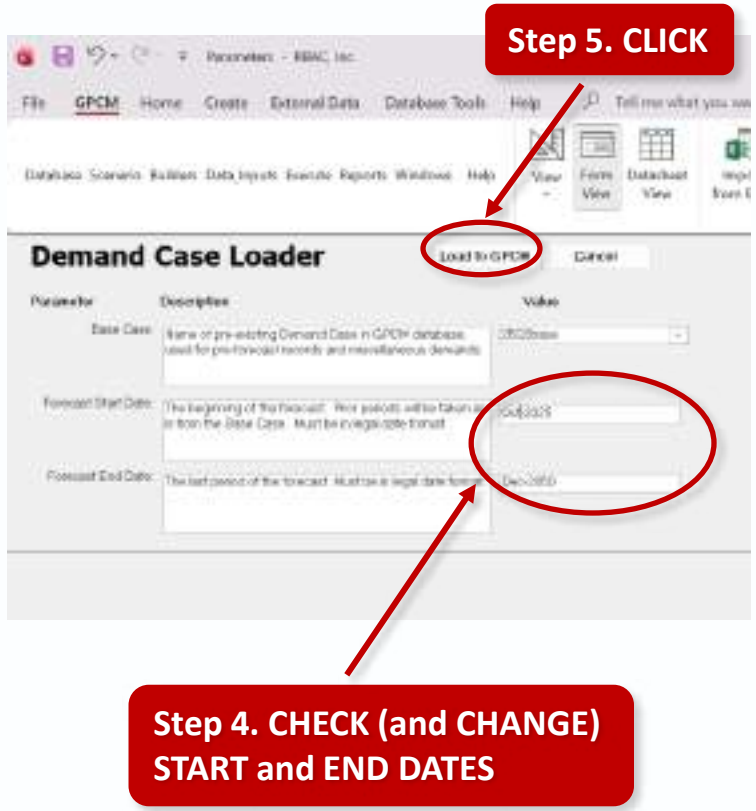
Part 3: Load Case and Run Scenario in GPCM

Step 1 – Load Case into GPCM

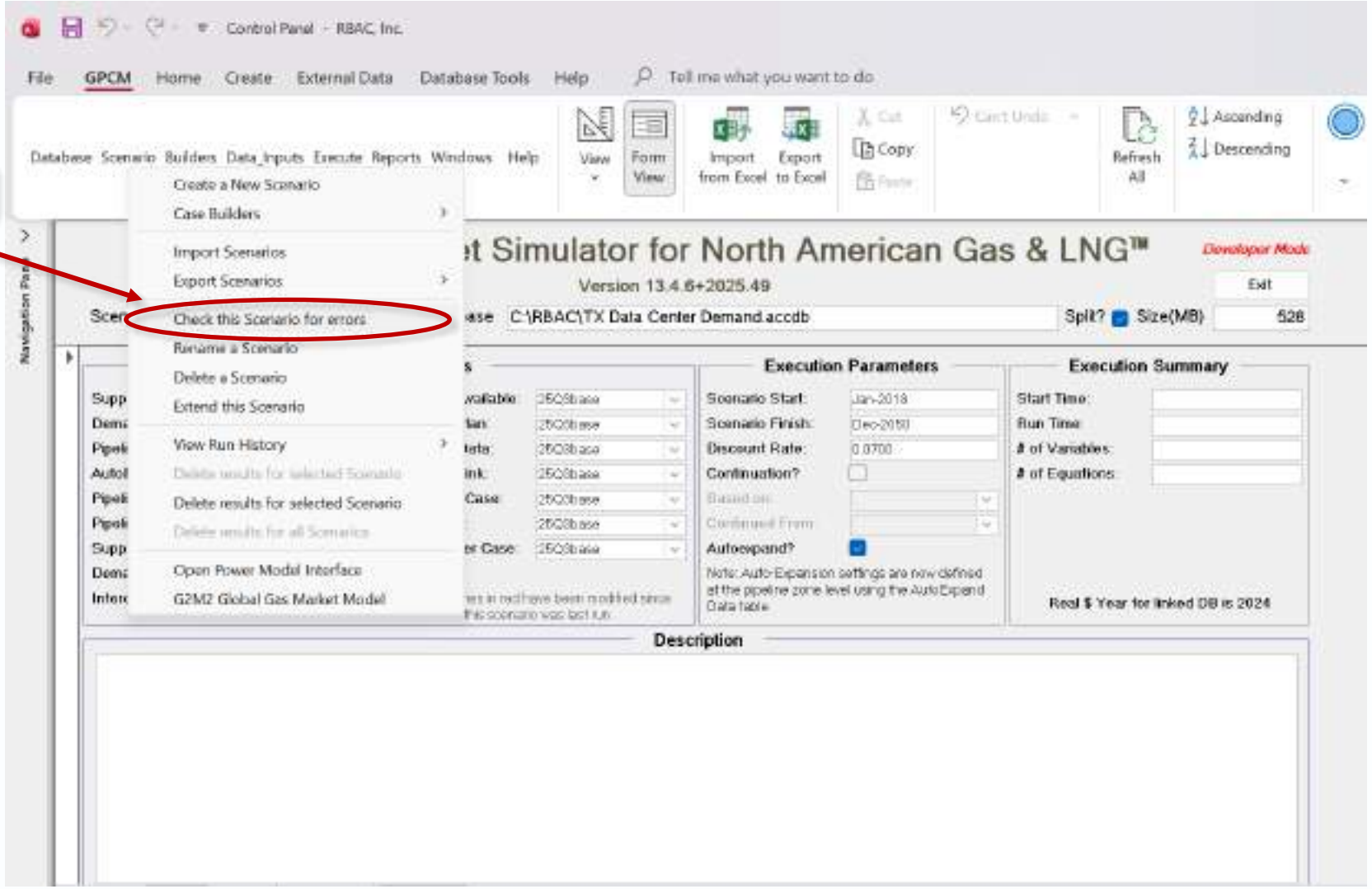




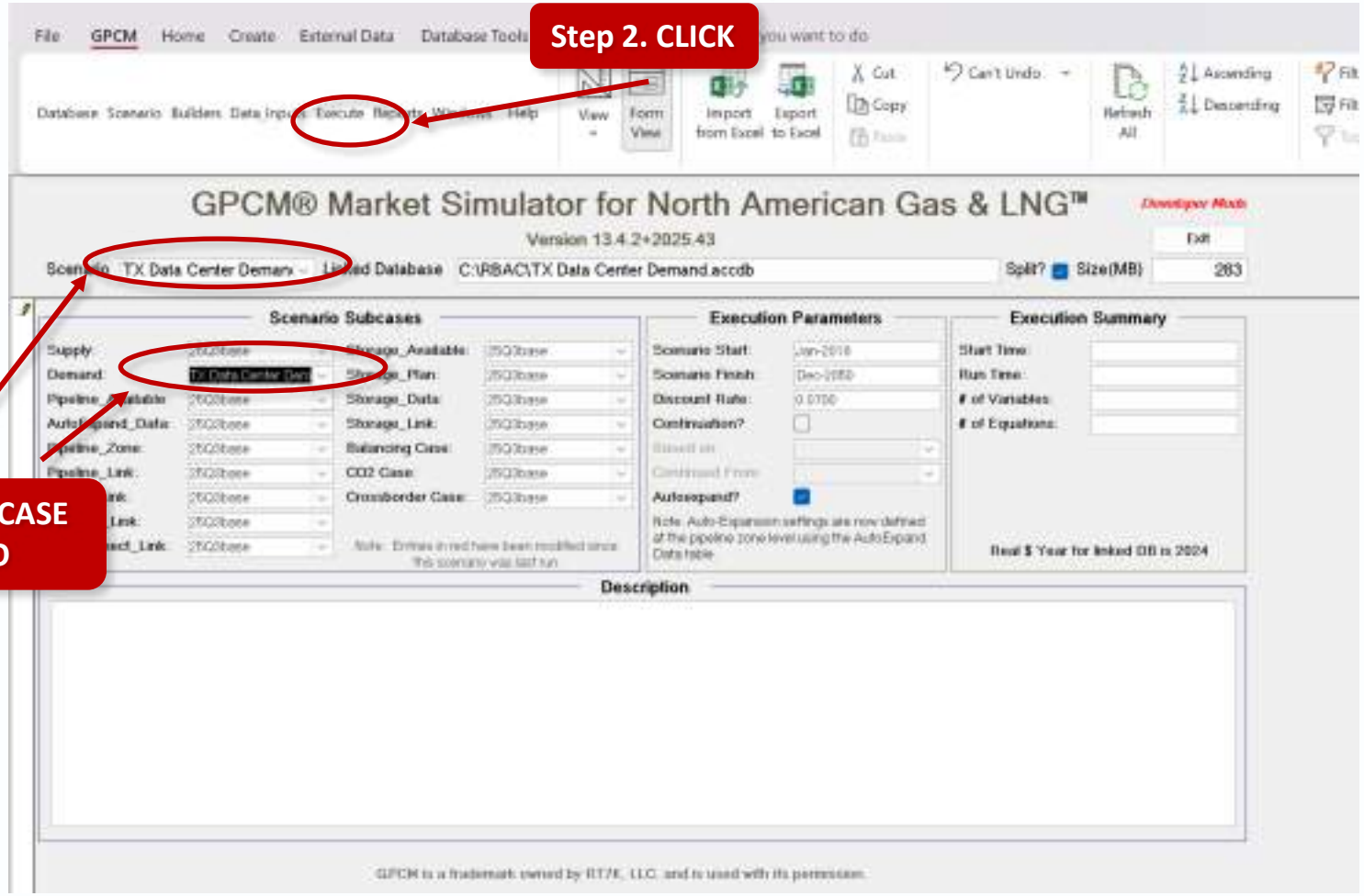


Step 2 – Check Database for Errors

Step 1. CLICK



Step 3 – Run Scenario in GPCM



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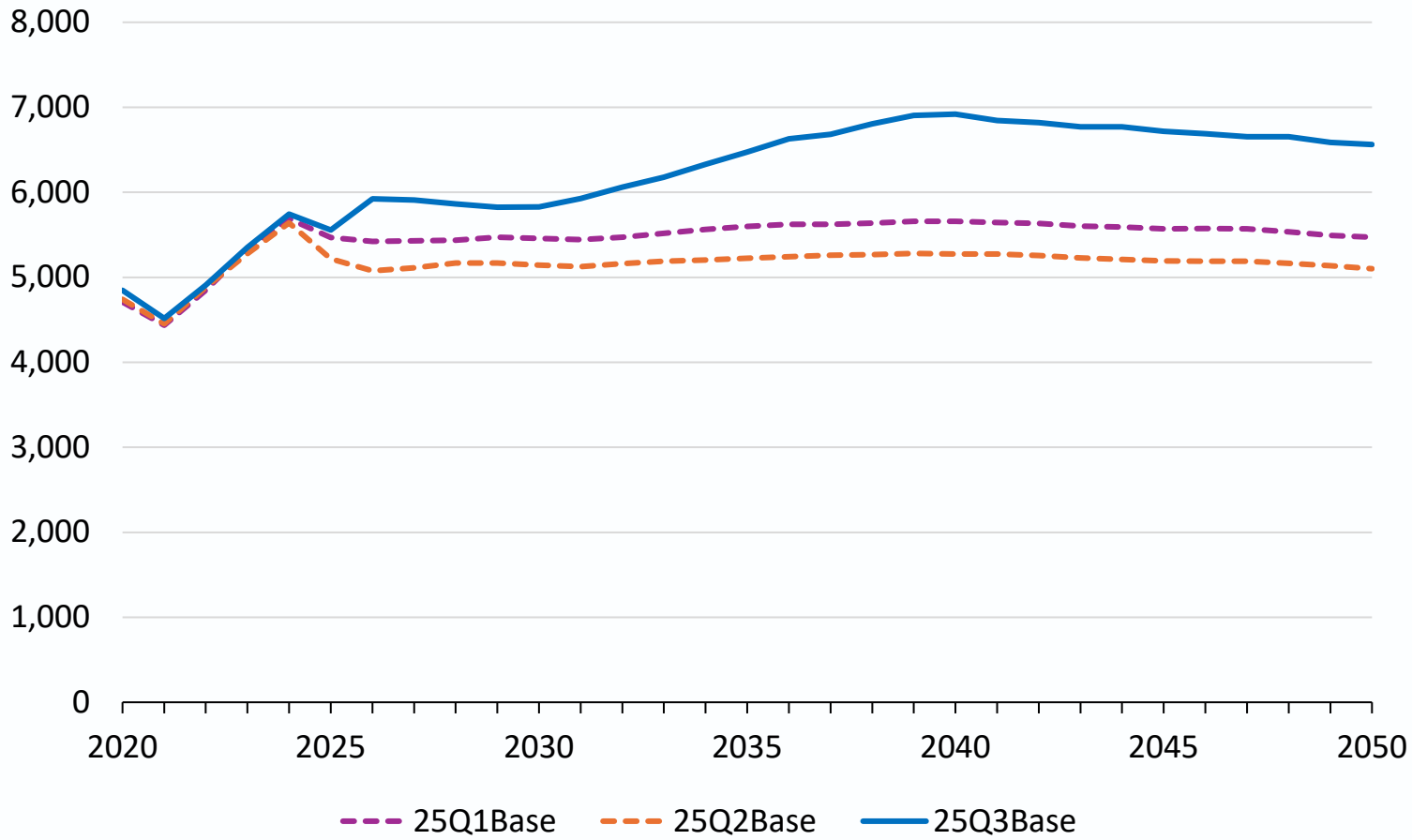
Part 4: Compare Results

Electric Sector Consumption

Texas' Annual Natural Gas Consumption from Electric Power Consumers, 2020 – 2050 (MMcf/d)



QUESTIONS?

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contact@rbac.com

RBAC leads the market in global and regional gas and LNG market simulation and predictive analytics in support of corporate investment and M&A strategy, ESG, risk analysis, planning, and commodity trading. Our products and expertise help companies go beyond the narratives and hype to identify the opportunities and define the risks inherent in the uncertainties of energy transition using reality and fact-based fundamentals and analysis.

We continuously enhance our market simulation systems with the latest software and computer technology while applying the best of mathematical economics to assist our clients achieve their goals. This is especially needed as we see fundamental shifts taking place in the energy industry to achieve energy transition goals and meet increasingly demanding requirements of ESG. We provide regularly scheduled updates of our simulation systems and databases to keep our clients up-to-date with the most current market information. We enhance the functionality of our systems to enable our customers to simulate the effect of new regulations or industry requirements.

Our aim is to continue to lead the market in best practices which raise the standard of market simulation, enabling rapid and flexible scenario generation, sensitivity analysis, risk-assessment and forecasting, giving clients the edge in the rapidly changing energy market.

Those using RBAC's products and services include energy industry firms and consultants, as well as government agencies involved with energy, transportation, and the environment.

RBAC's principal products include:

- **GPCM® Market Simulator for North American Gas and LNG™** focused on the North American gas & LNG markets. GPCM is the industry standard market simulator for North American gas.
- **G2M2® Market Simulator for Global Gas and LNG™** for simulating increasingly integrated gas and LNG markets worldwide.
- **Gas4Power®** for integrating gas and power market fundamentals to produce credible forecasts for both.
- **NGL-NA®** Market Simulator for North American Natural Gas Liquids

With RBAC's advanced simulation systems, licensees can create and run scenarios involving bio-methane (Renewable Natural Gas – RNG) mixed with natural gas and to assess the implications of carbon taxes and markets on supply, demand, and prices. Future enhancements will include the ability to simulate the advent of a future hydrogen market with both pure hydrogen pipelines as well as mixtures with methane. The Energy Analyst of today and the future needs these kinds of tools to conduct realistic assessments and help develop realistic strategies and plans to achieve the goals of the energy transition.

Dr. Robert Brooks founded RBAC in 1987 based on experience developing several well-respected predictive models for government and industry. He designed the first gas transportation model while getting his PhD at MIT and has led the industry ever since.

RBAC's staff includes industry-trained experts in natural gas supply and demand, transportation, storage, marketing, and trading. Our team applies its world-class expertise in mathematical modeling, statistical analysis, mathematical algorithm development, software engineering, and database design to current and future challenges, risks and opportunities in energy.