



The Future Outlook of Asia

U.S. LNG Trade Under Various Uncertainties

RBAC User Conference 2024, Orlando FL

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**

Potential Uncertainties in the Future LNG Market

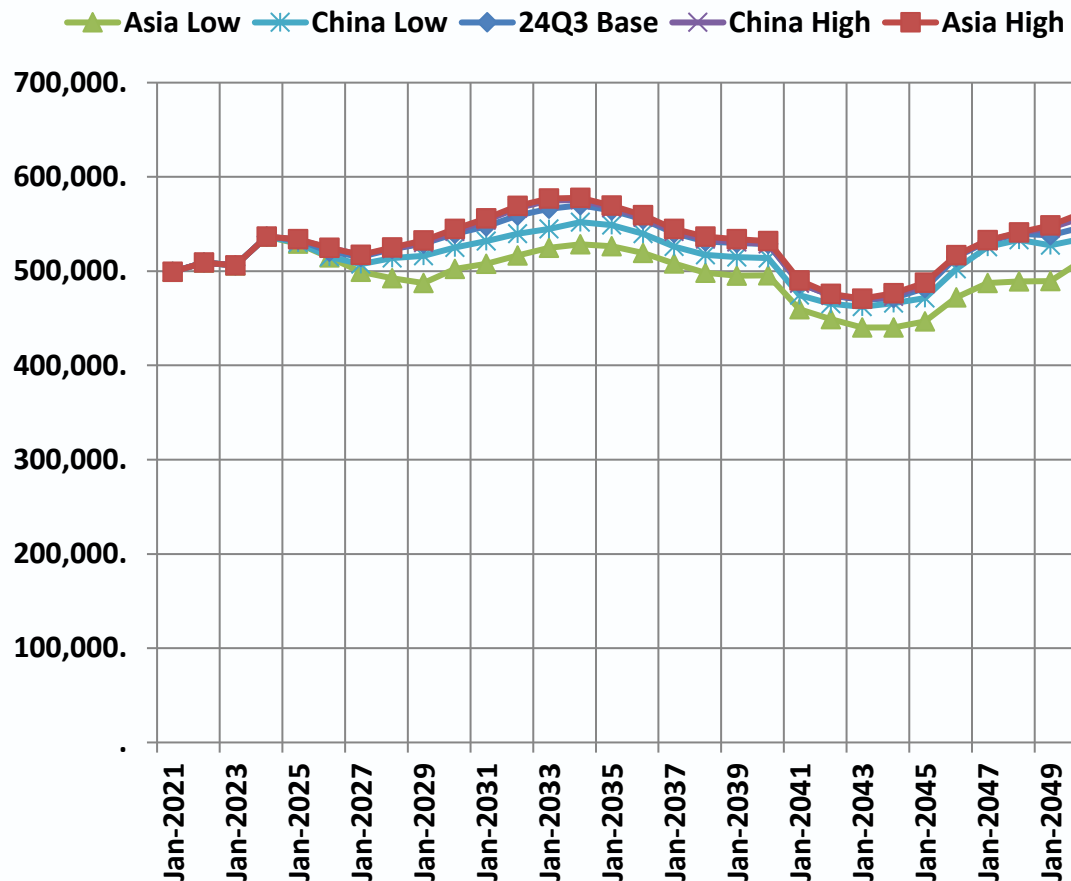
- LNG Production / Export Plants
 - FID or not (e.g. Mozambique)
 - In-service date slippage (e.g. Golden Pass LNG)
 - Government intervention (Biden’s “LNG Pause”)
- LNG Import Plants
 - Schedule slippage (South and Southeast Asia)
 - Decarbonization goals (Europe)
 - Geo-political situations (Russia – Arctic LNG 2)
- Global natural gas demand growth
 - Especially in Asia

G2M2 Scenario Setup

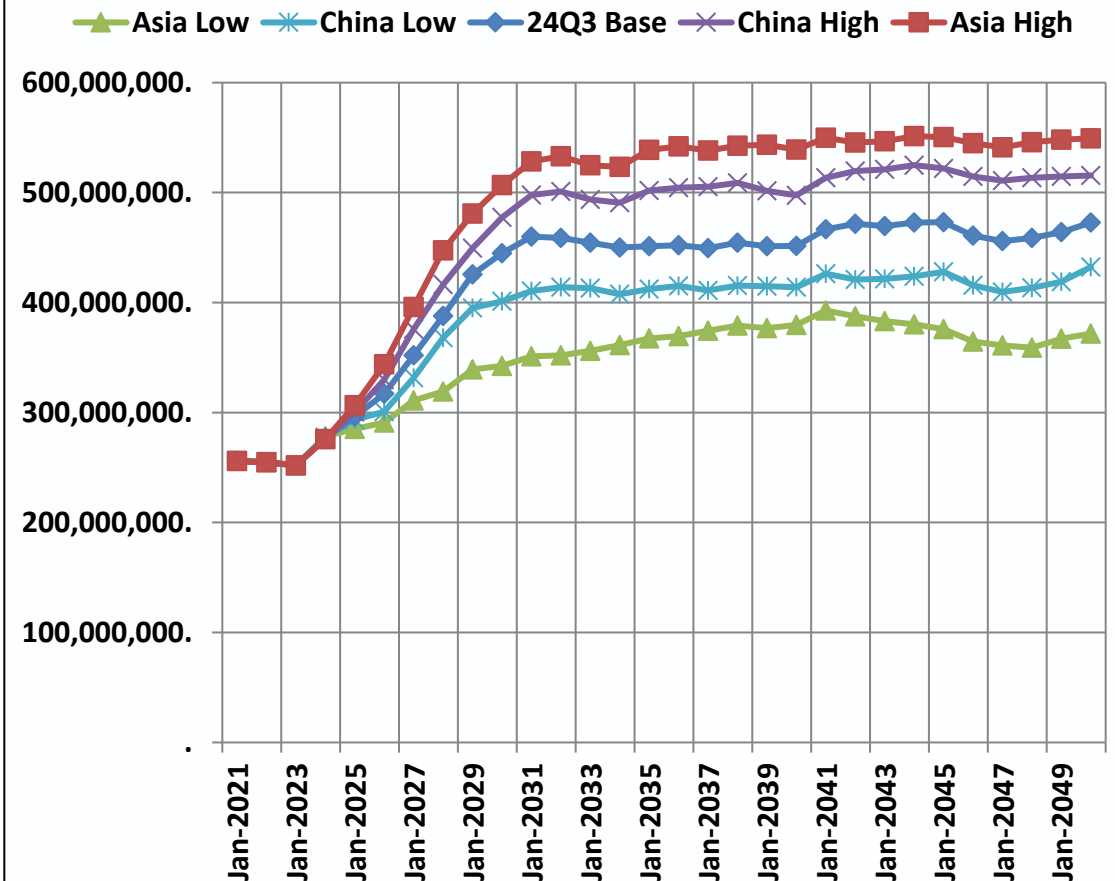
- Focusing on uncertainty of demand growth in Asia, design high and low scenarios around a “base case” and compare results
- Consider “High / Base / Low” for both China by itself and the entire continent of Asia
- This means five scenarios
 - Base Case
 - Asia + 20%
 - Asia – 20%
 - China + 20%
 - China – 20%

Effect on Asia Gas Production and LNG Demand

Total Gas Production Asia (MCM/Year)

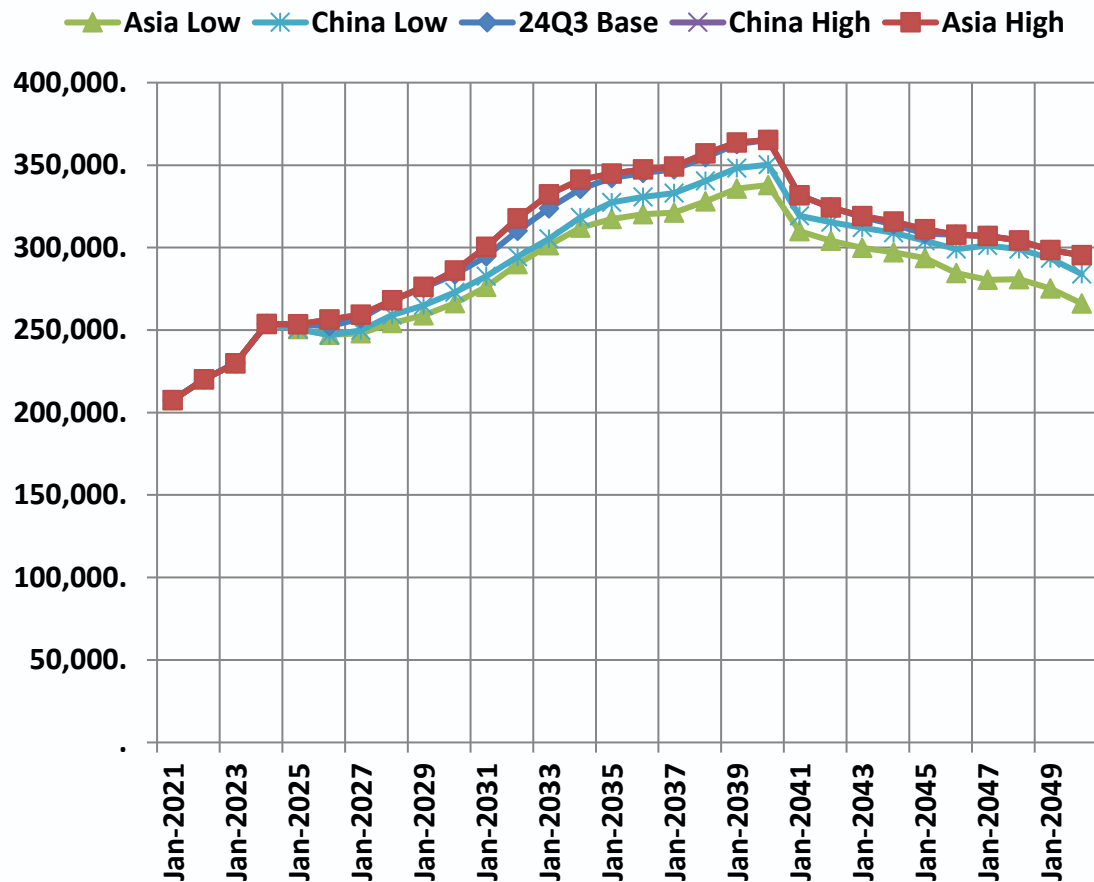


LNG Demand in Asia (MT)

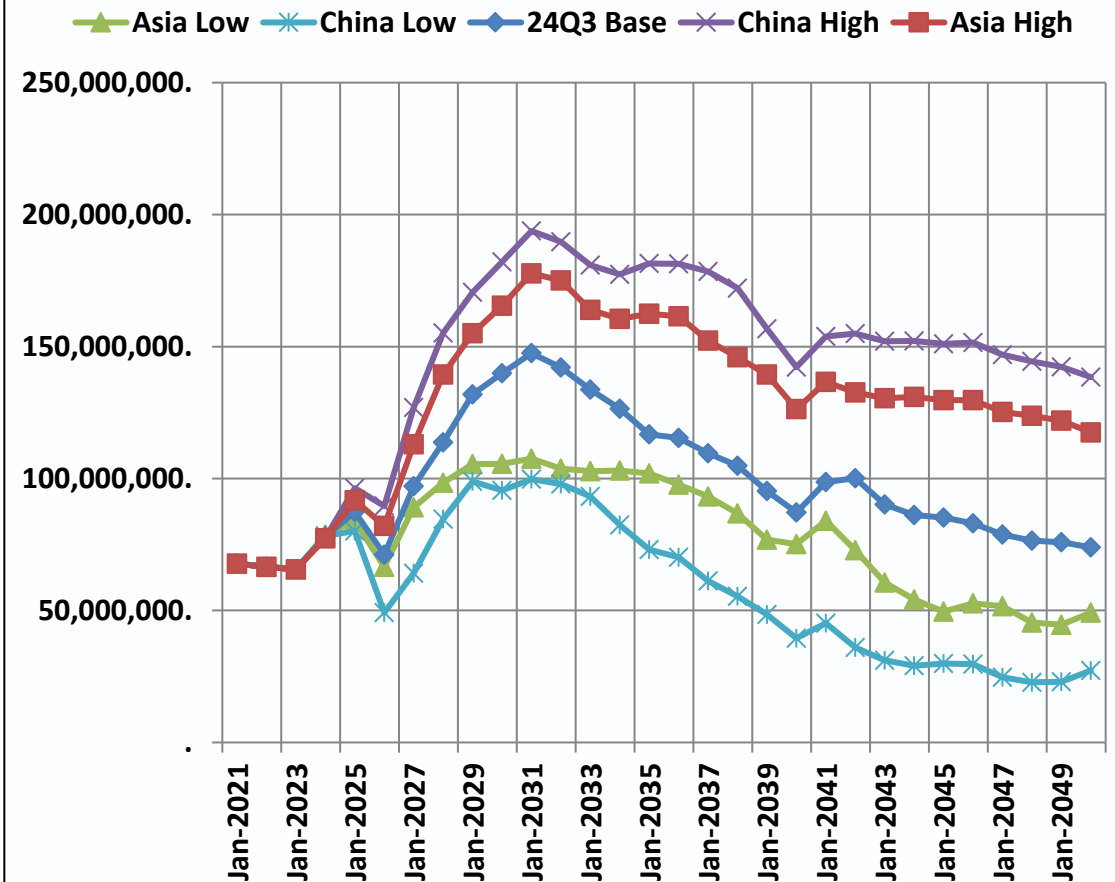


Effect on China Gas Production and LNG Demand

Gas Production in China (MMC/Year)

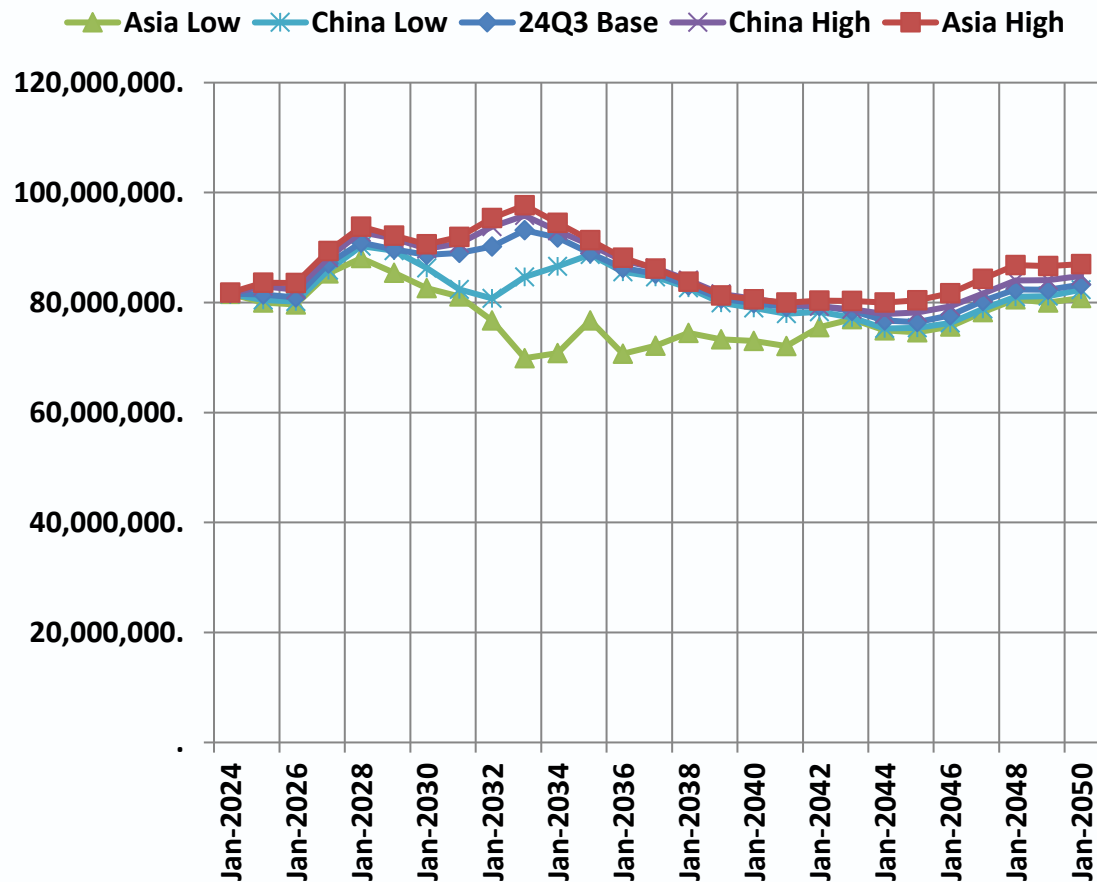


China LNG Imports/Regas (MT)

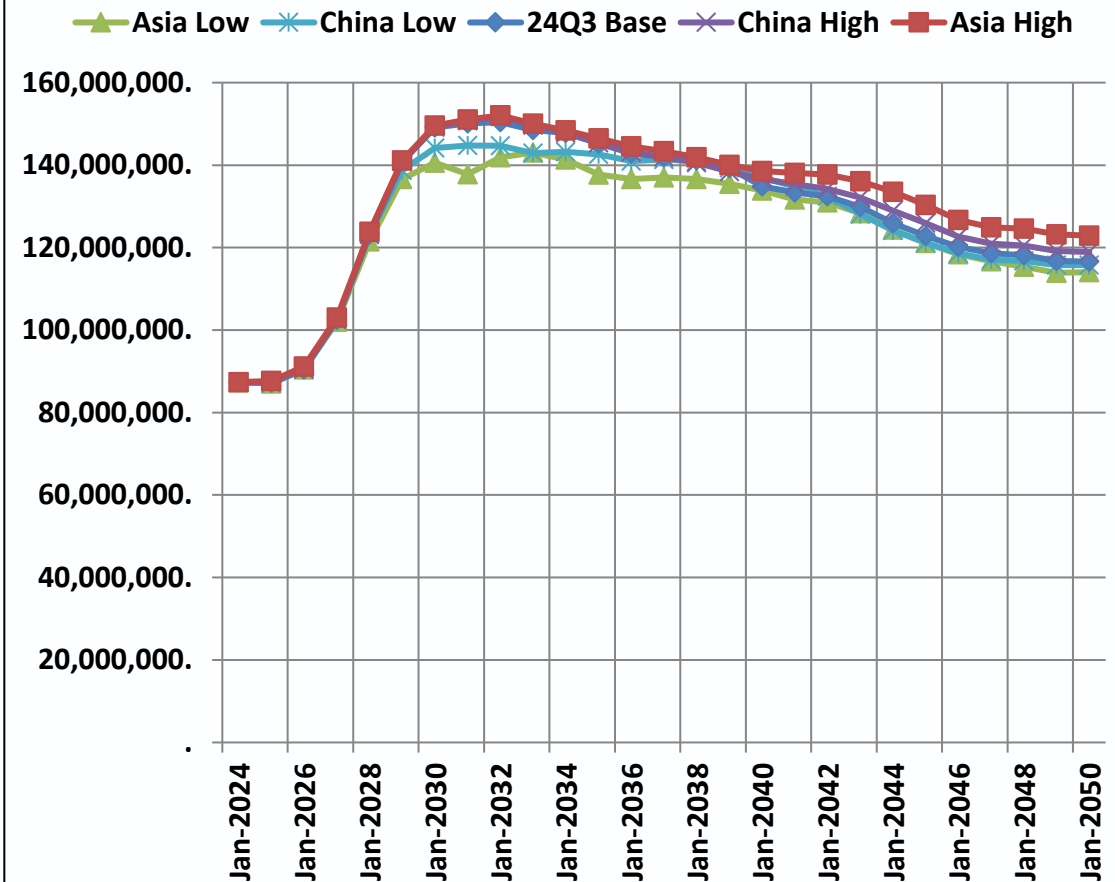


LNG Production: Australasia and Middle East

LNG Production: Australasia: MT

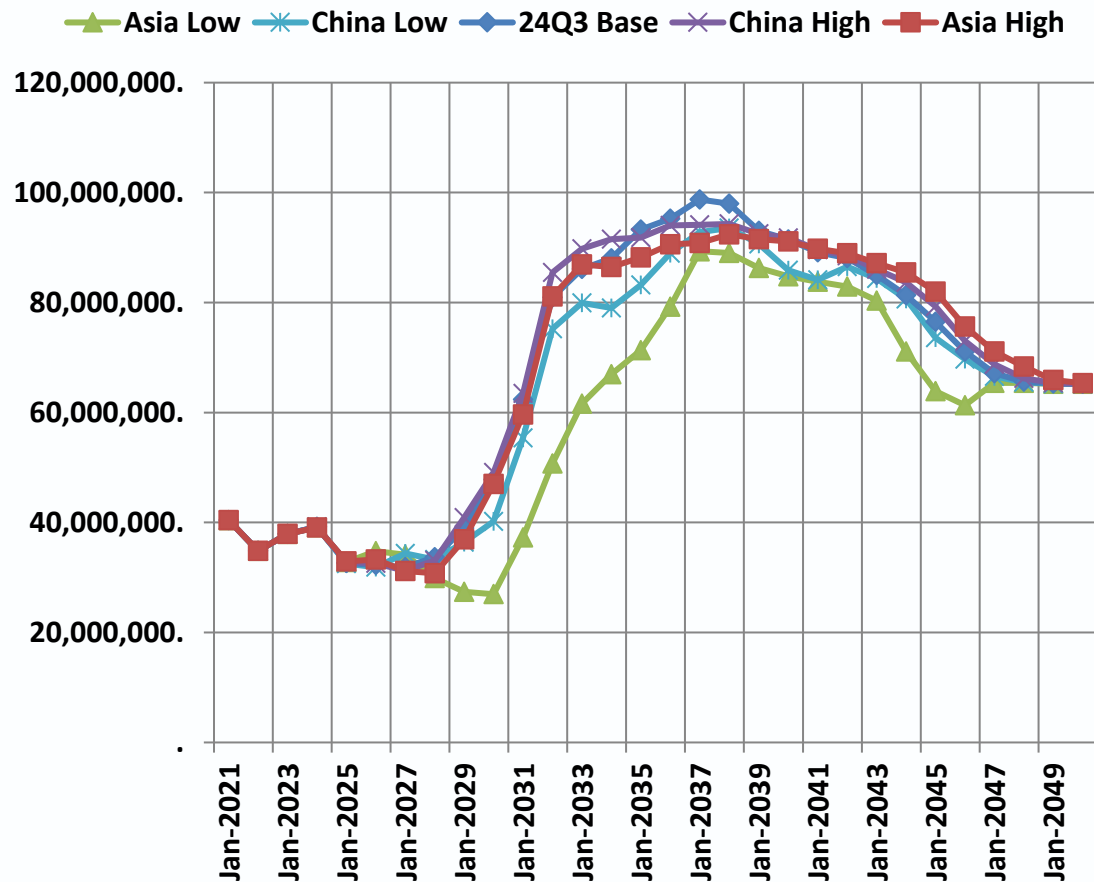


LNG Production: Middle East: (MT)

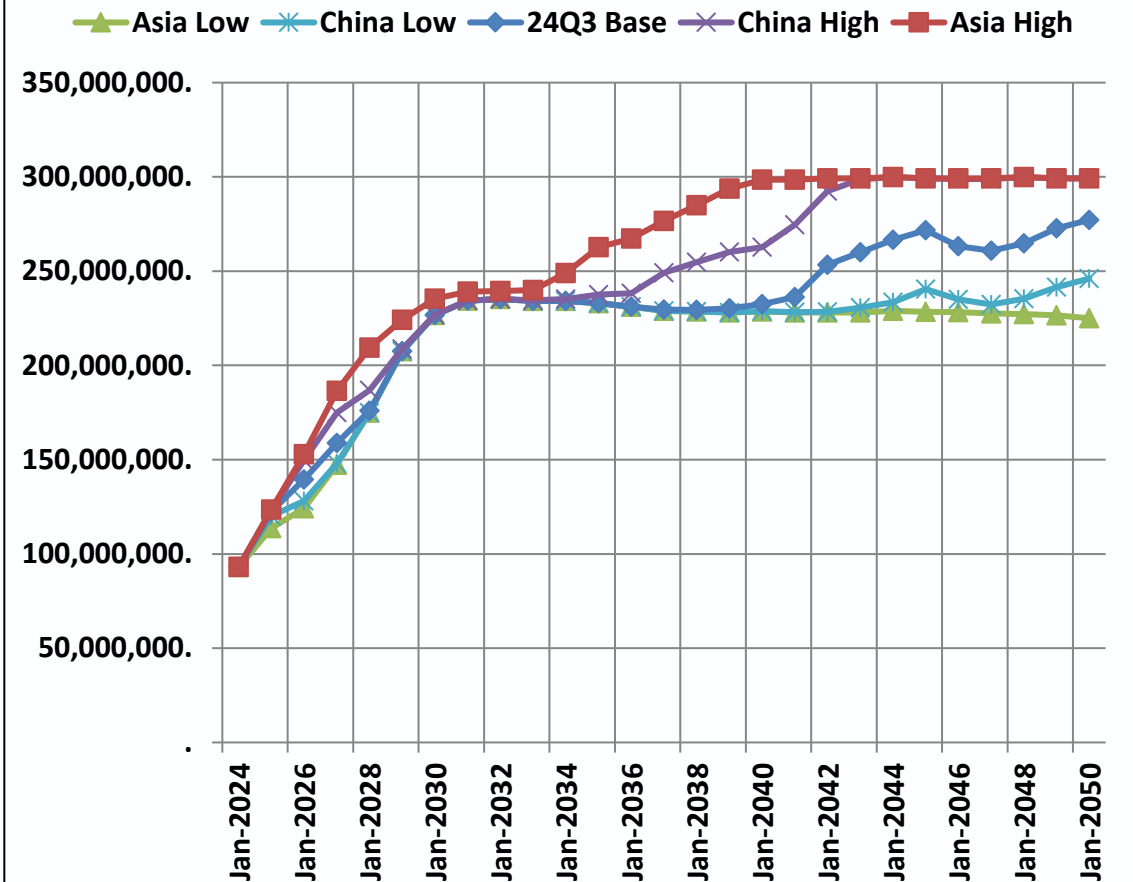


LNG Production: Africa and North America

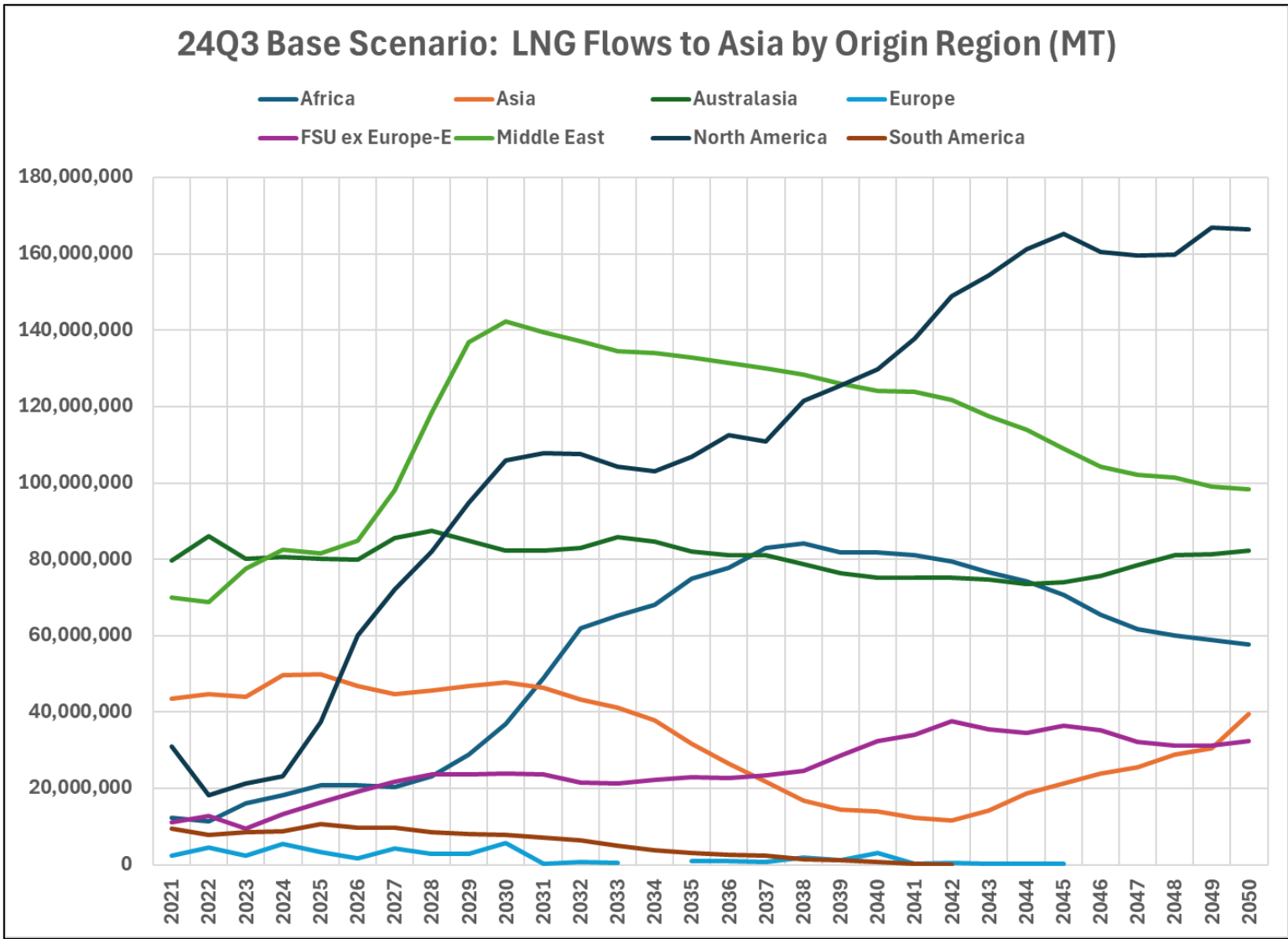
LNG Production: Africa: (MT)



North American LNG Production: (MT)

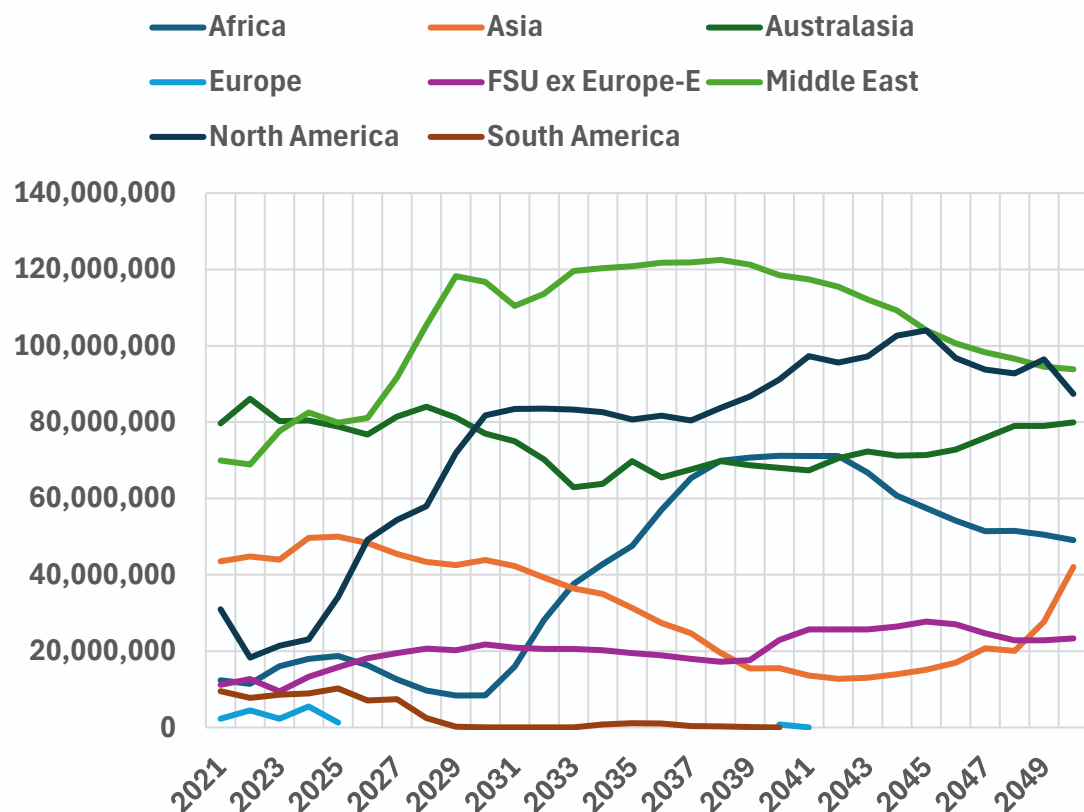


23Q4 Base Case: LNG Sources to Asia

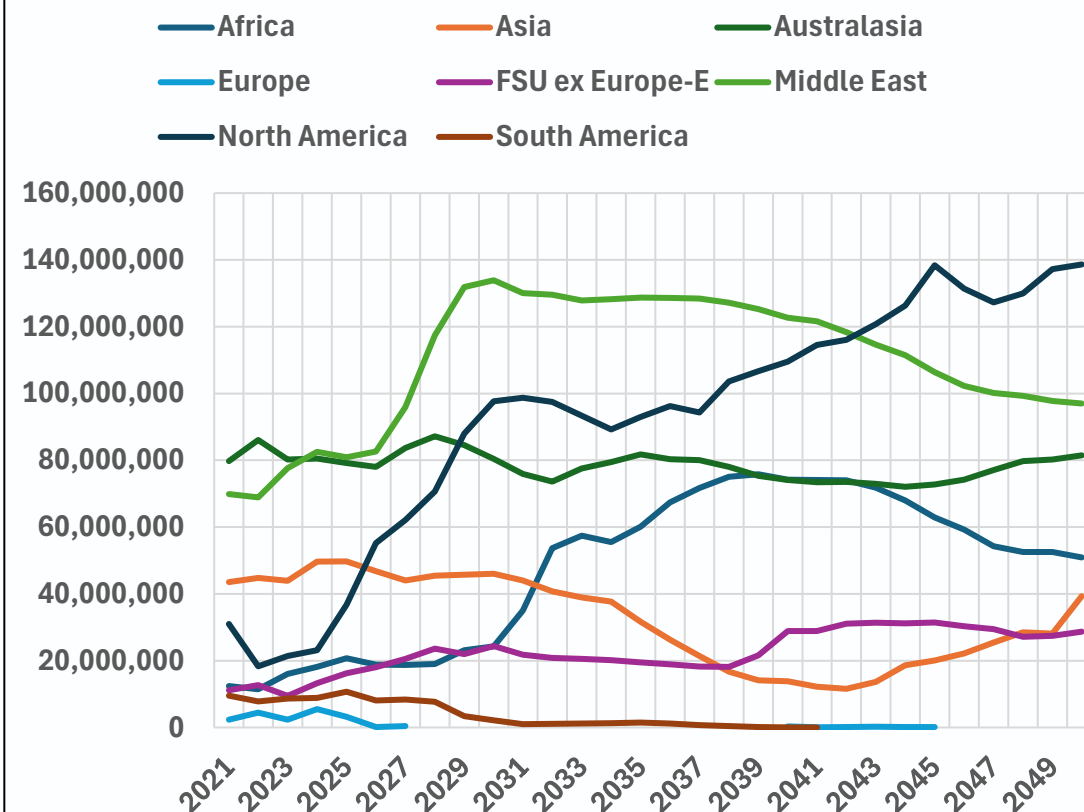


Asia Low and China Low Scenarios: LNG Sources

Asia Low Scenario: LNG Flows to Asia by Origin Region (MT)

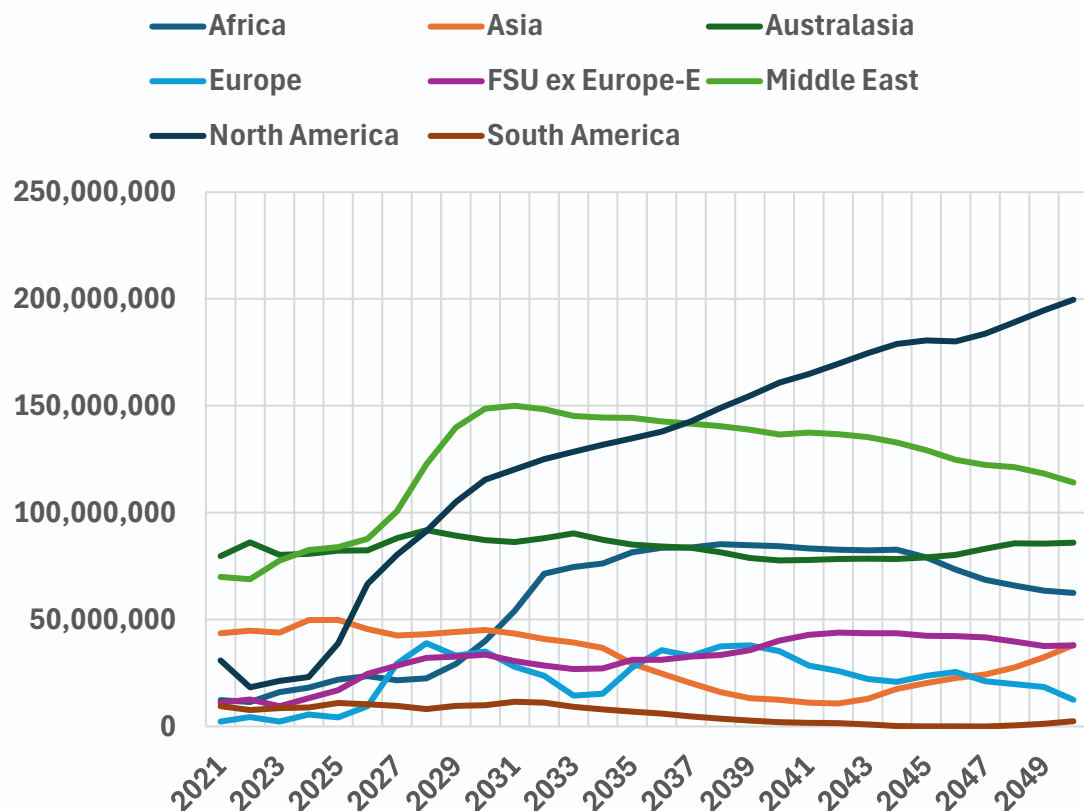


China Low Scenario: LNG Flows to Asia by Origin Region (MT)

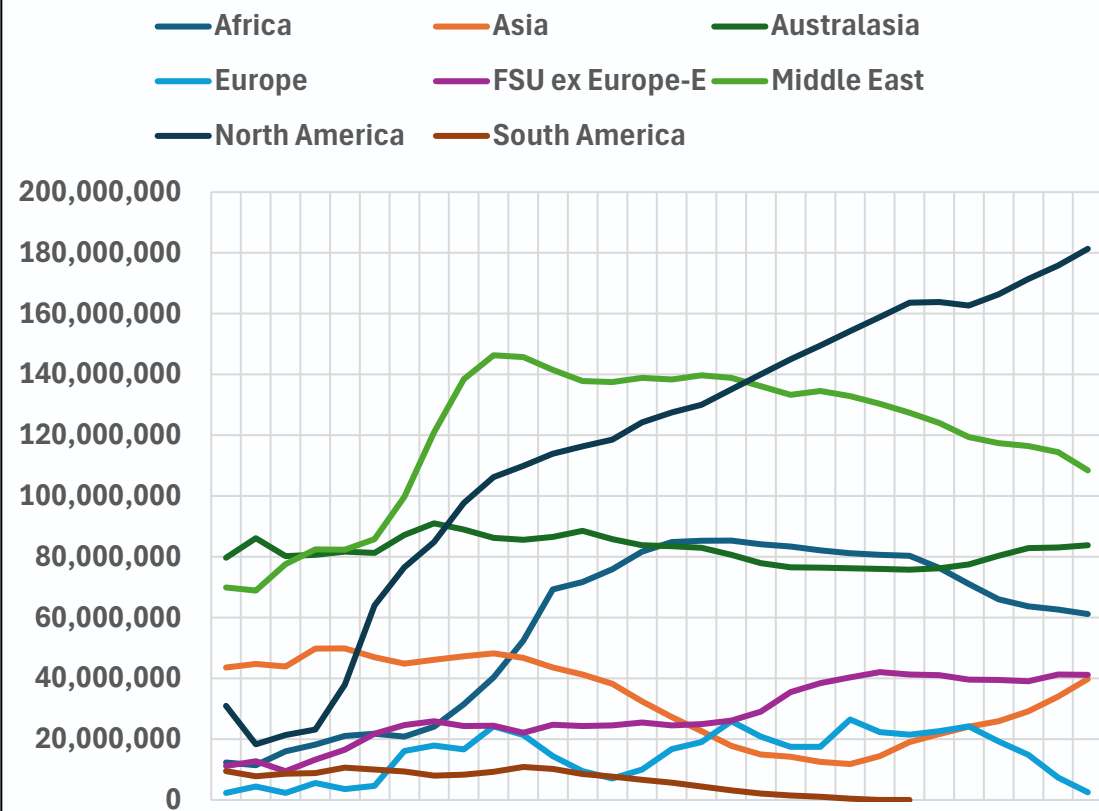


Asia High and China High Scenarios: LNG Sources

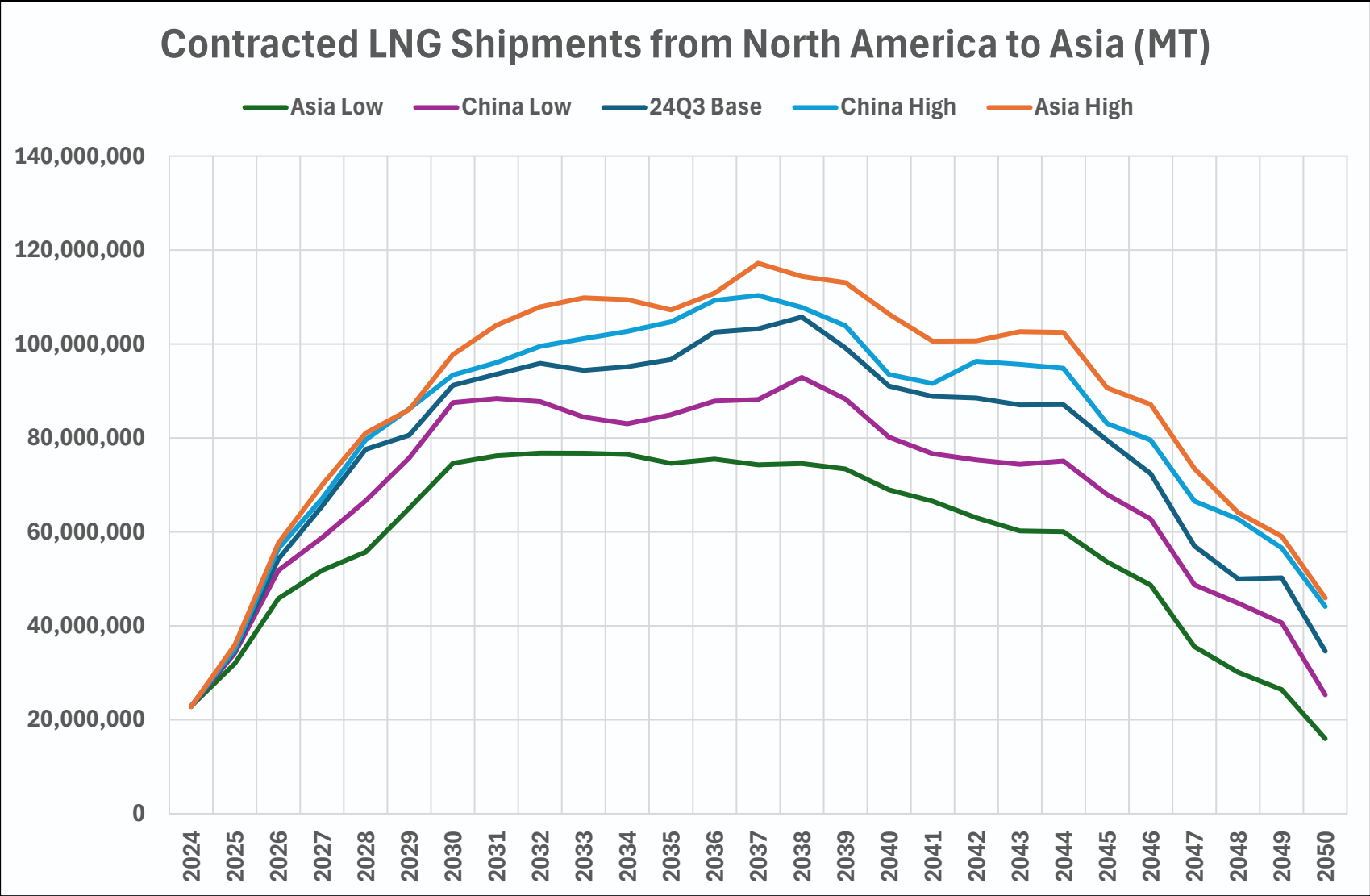
Asia High Scenario: LNG Flows to Asia by Origin Region (MT)



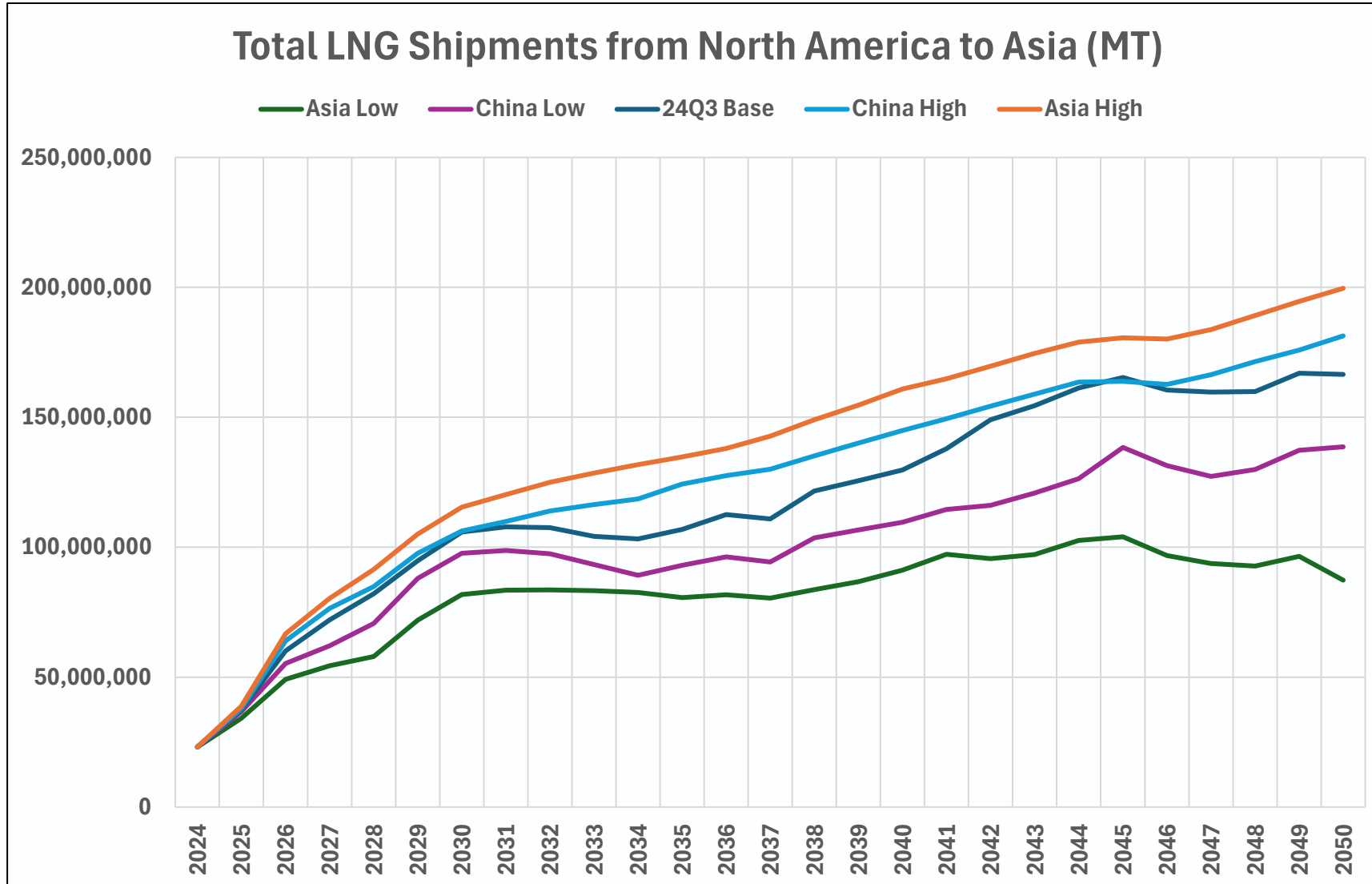
China High Scenario: LNG Flows to Asia by Origin Region (MT)



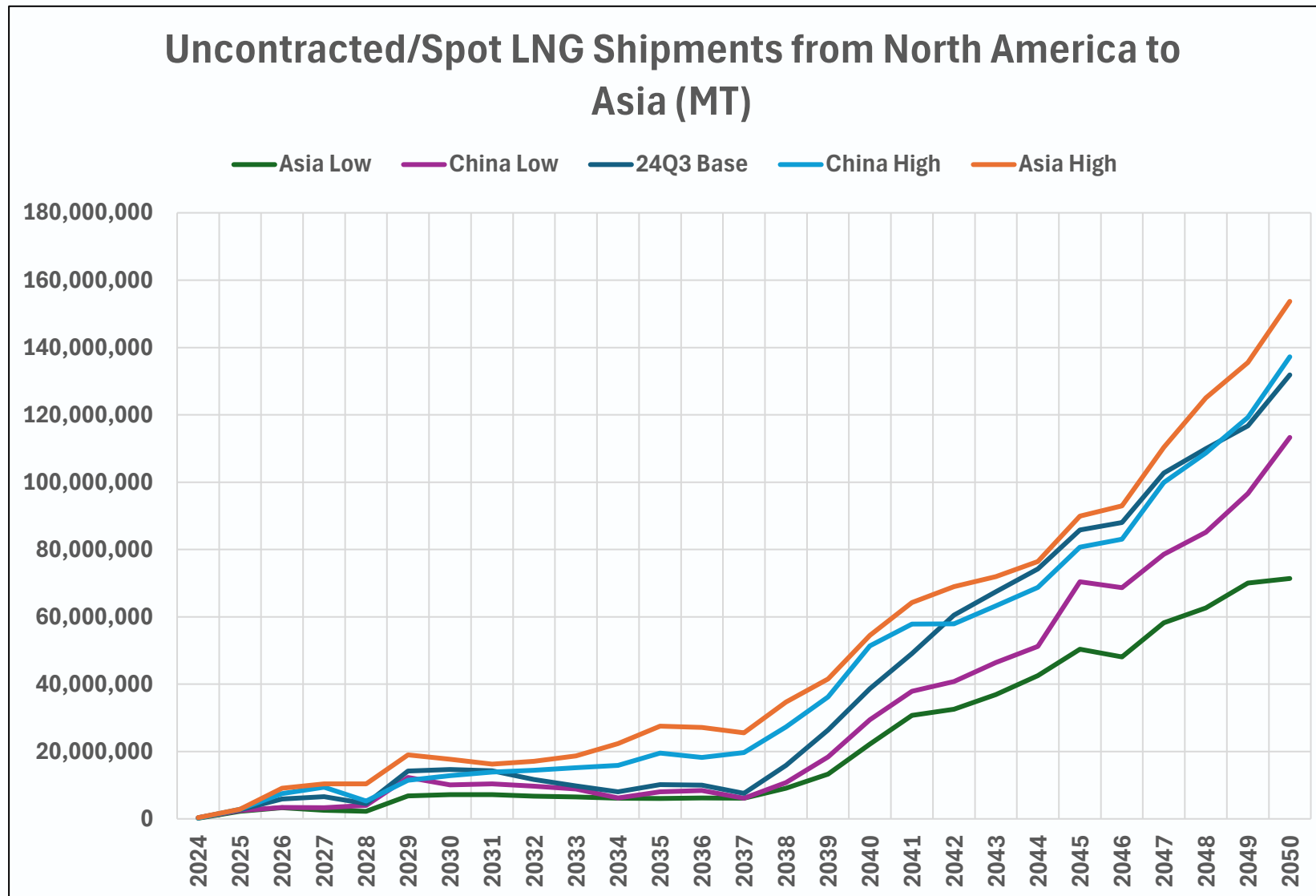
LNG Contracted Shipments from North America to Asia



LNG Shipments from North America to Asia



LNG Spot Shipments from North America to Asia



Analysis

- LNG opportunities for North America (and other LNG sources around the world) will be highly dependent on growth prospects in Asia and particularly in China
- North America is poised to capture a great deal of this market in the future, whether overall gas demand grows strongly or not
- Currently contracted LNG from North America to Asia will reach its peak in 2037 and decline from there
- Demand for additional LNG will grow strongly from 2038 through the remainder of the forecast period in 2050

QUESTIONS?





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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.