



Unlocking insights into European Gas Markets

April 15 2024



Agenda

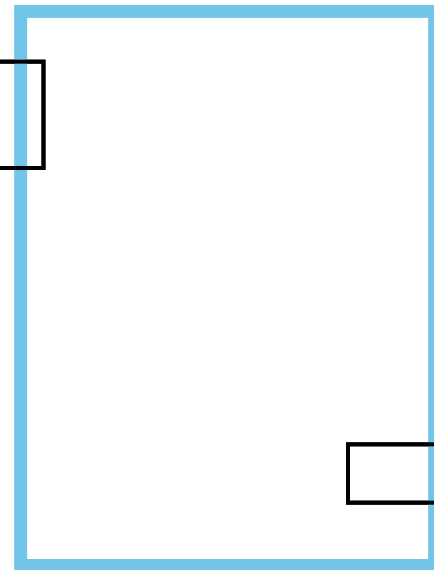
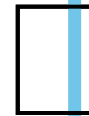
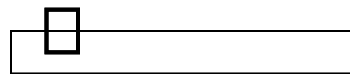
- Introductions
- ICIS European gas market overview
Spring/Summer 2024
- ICE EU Gas markets
- Q&A

Today's speakers

Ben Weatherall – Market Strategy Director, ICIS

Alice Casagani – Head of European Gas Editorial, ICIS

Wouter De Klein – Senior Director, Utility Markets, ICE





European gas market overview Spring/Summer 2024

Alice Casagni - Head of European gas editorial, ICIS

Ben Wetherall – Market Strategy Director, ICIS

15 April 2024





Agenda

- 01 TTF prices in Winter 2023 and key drivers
- 02 Global gas dynamics
- 03 Impact on TTF
 - 3.1 Changes in volatility
 - 3.2 Changes in time and locational spreads
- 04 Outlook

ICIS – supporting energy market development and transition



More than **150 years** of **deep expertise** in downstream chemicals, energy and fertilizer markets



ICIS has been at the forefront of bringing **transparency** and insight to **European energy markets** for over 30 years with European gas pricing data widely acknowledged and trusted as a benchmark with many physical gas and LNG contracts referencing ICIS prices



>90% of Europe's largest gas and LNG companies use our data



Providing trading decision support through **ICIS Energy Foresight**, a comprehensive analytics solution incorporating LNG, Natural gas, Power and Carbon.



Working with industry market participants to develop pricing, news and analysis on **formative energy transition markets** including **hydrogen**



ICIS **energy market data** and analytics is used by global **governments and regulators** to inform and support their decisions.



Data predicting import volumes of the **world's LNG cargoes** and **monitoring shipping flows** worldwide in real time



Global reputation of **ICIS Consulting** delivering world-class market engagement



Analysing more than **1.5 billion data points** a year to forecast power prices in 29 countries in Europe – forecasting every hour until the year 2050



ICIS has **passed an external audit** of our assessments for the past **10 years** (IOSCO)



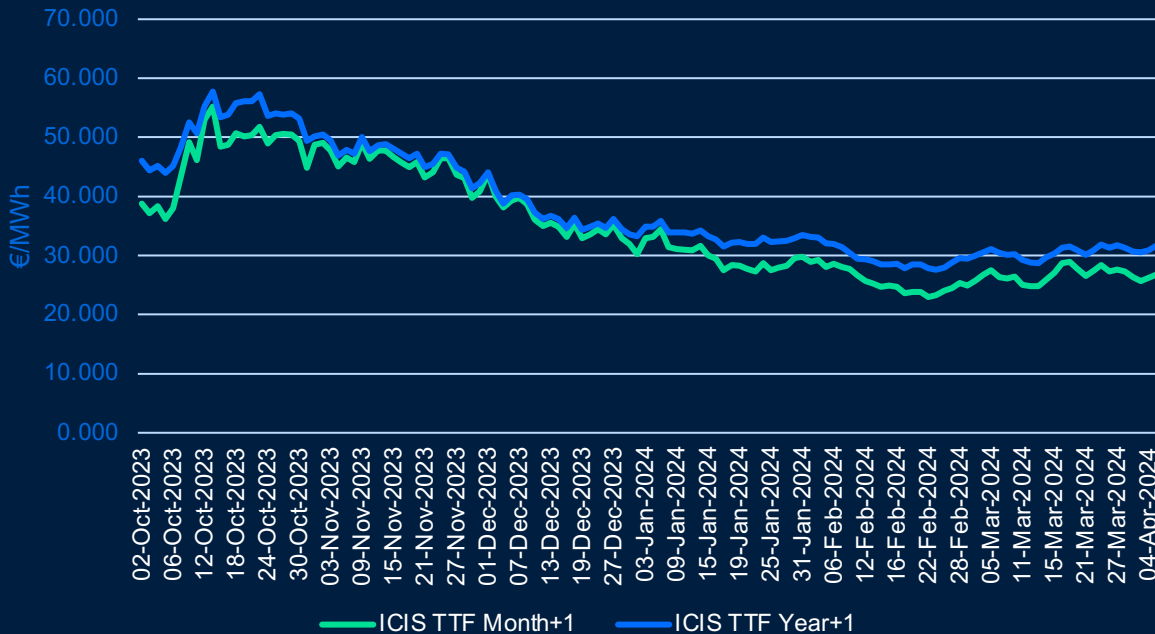


TTF in a globalised gas market

European gas prices drop in winter 2023



Bearish fundamentals pressure TTF

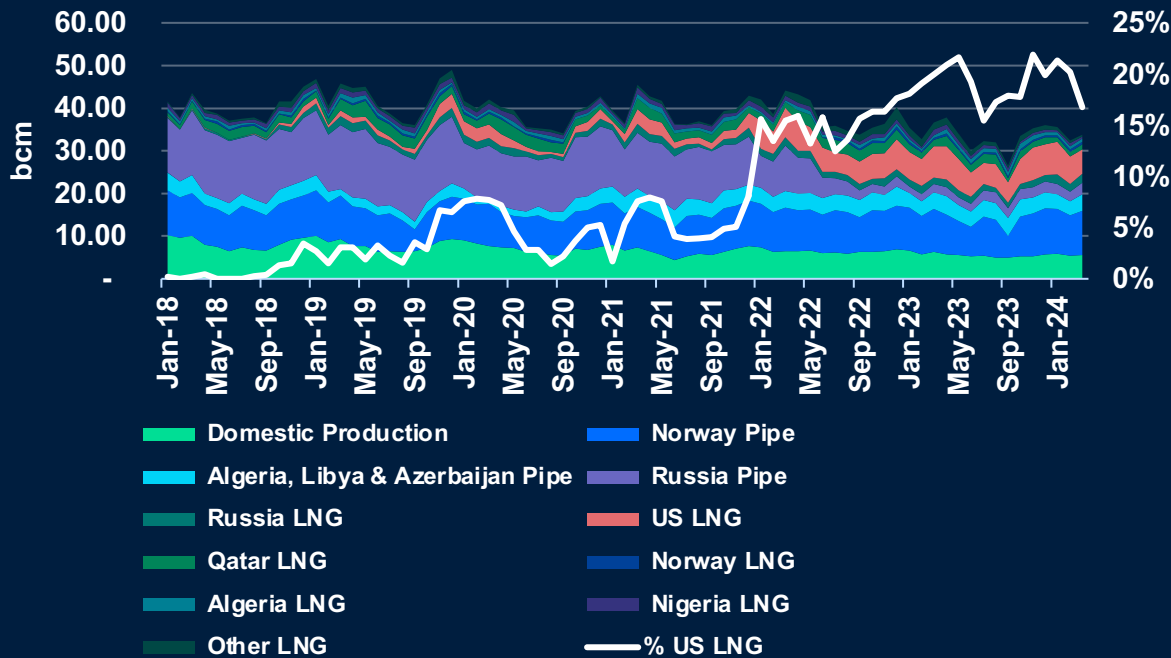


- Demand remains below historical average
- Mild weather
- Ample LNG supply
- Improved infrastructure (higher regas capacity, less bottlenecks)
- Healthy storage scenario
- Less uncertainty around supply



Europe's structural supply shift

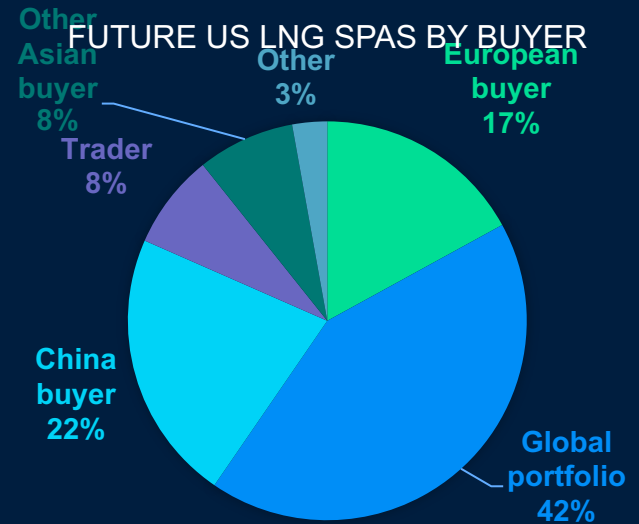
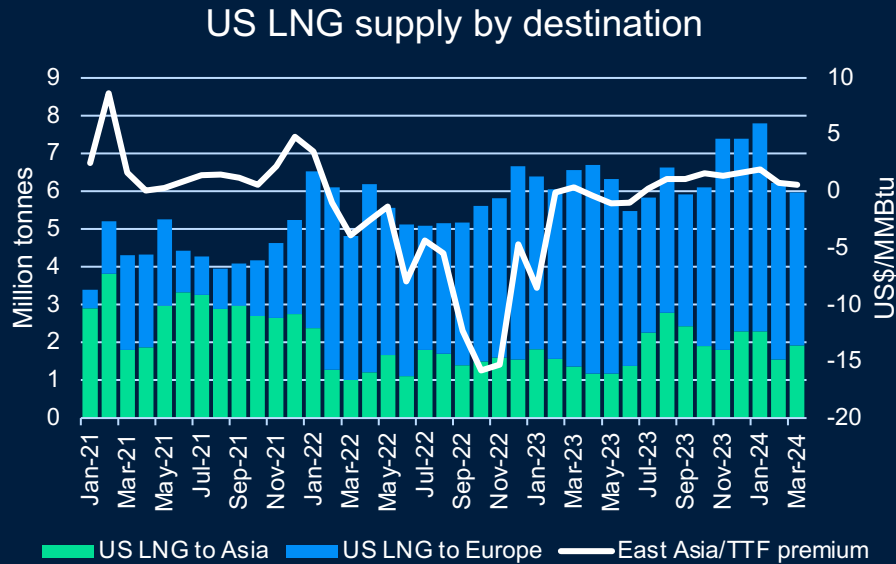
EU/UK Sources of Supply since Jan 2018



- Shift to flexible LNG - accounts for one-third of EU/UK supply in Q1 2024 – increases importance of TTF as global hub.
- Norway remains single largest source of pipeline supply at 31% in Mar-24
- Russian pipeline just 8% in March 24 and questions of continued Ukraine transit.
- Overall supply in Q1 2024 down 4% year on year to 98bcm but 20% down on Q1 2022.



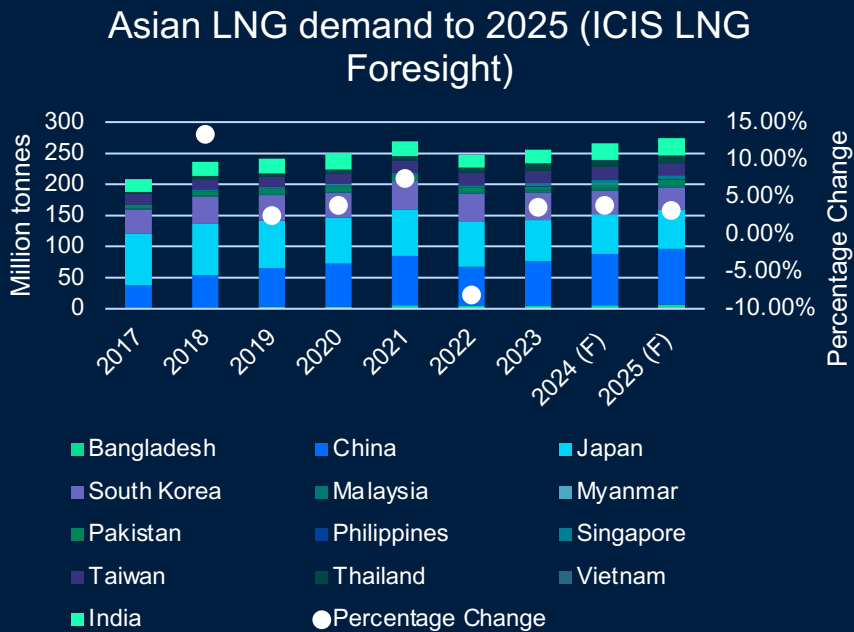
Balancing global demand – the role of TTF



- Demand flexibility key for next LNG supply wave
- TTF price signals and European storage connection will play crucial role for global market.



Signs of Asian demand recovery – but muted

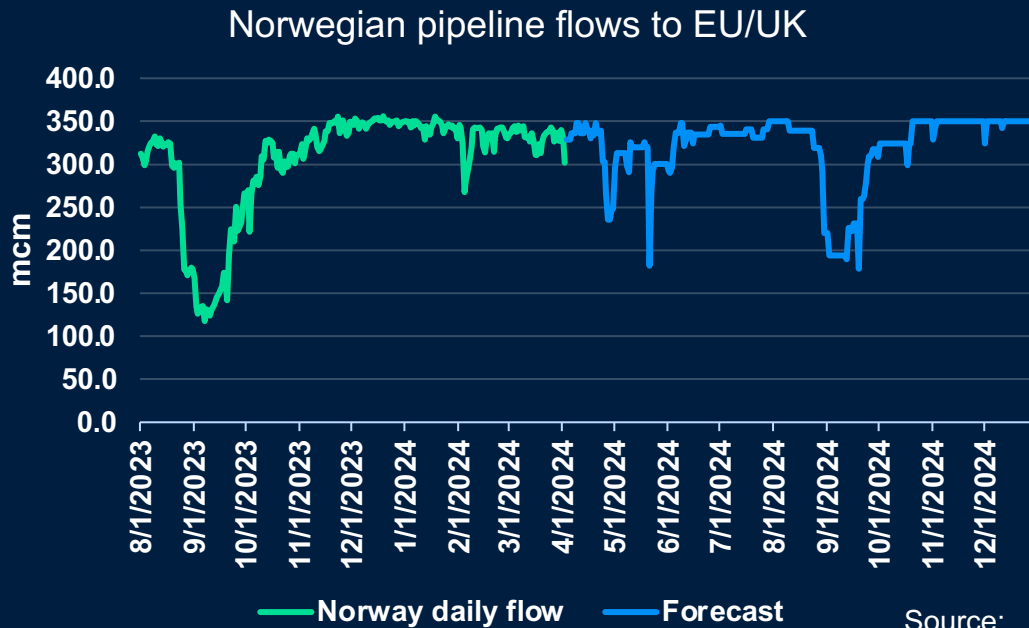


2024 LNG demand:

- China March LNG imports surged 29% year on year and reached a record of 6.8 m tonnes
- Chinese LNG demand forecast at 82.2mt in 2024, 15% y-o-y increase.
- ICIS Forecast: Asian LNG demand
 - 2024: 265mt , +3.8% y-o-y
 - 2025: 274mt, +3.1% y-o-y
- EU + UK LNG 116mt, +4% y-o-y



EU pipeline imports limited

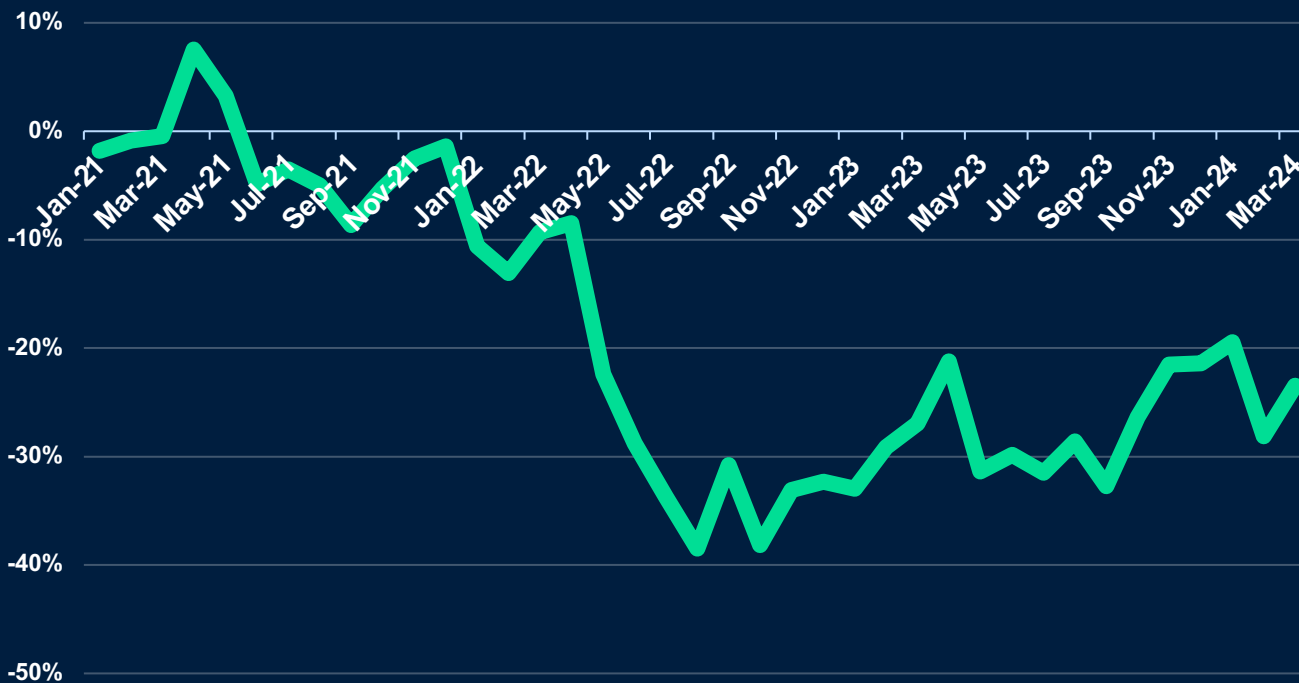


- Norway to remain single largest source of supply at 31% in Mar-24
- Summer maintenance less than 2023
- Russian pipe just 8% market share in Mar-24
- Role of MENA pipeline not likely to change in short-term

Weak EU/UK gas demand

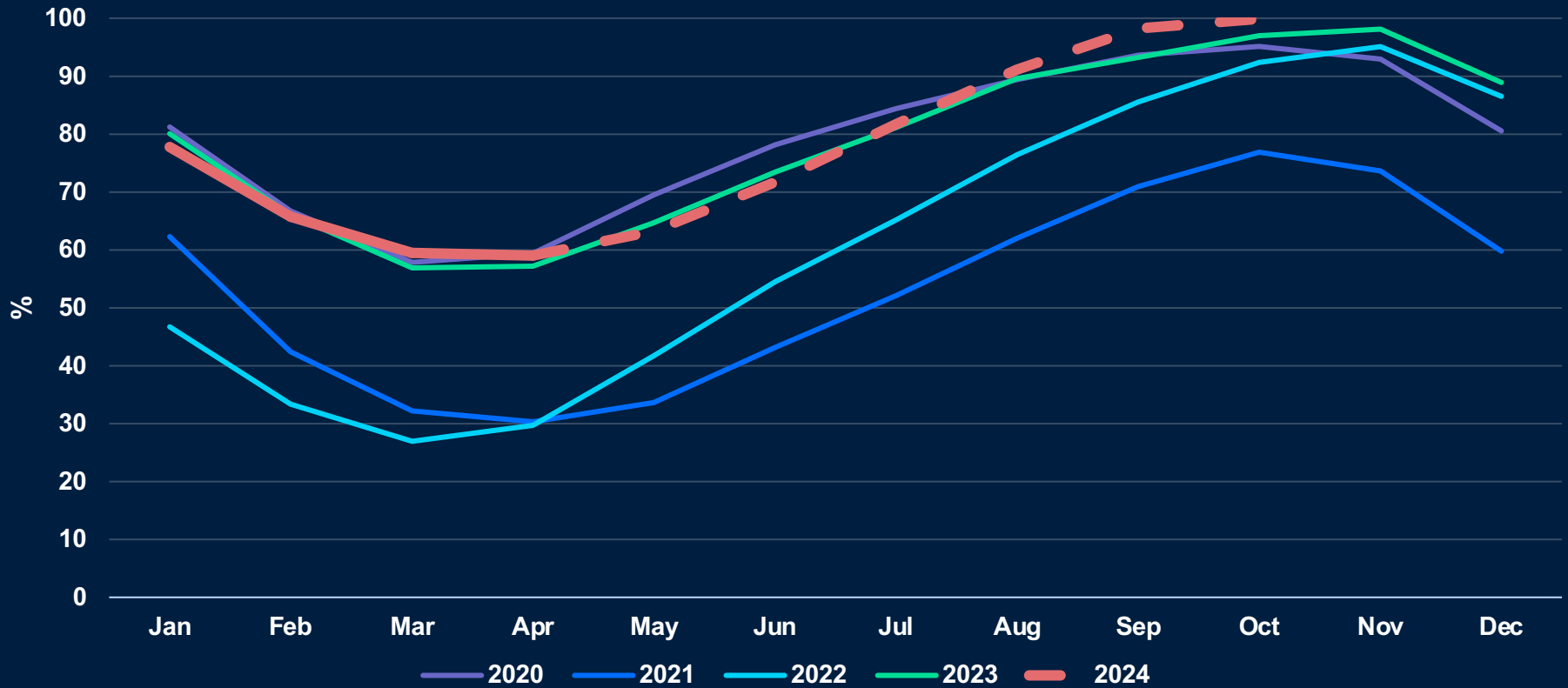


German gas-to-industry demand relative to 2017-21 monthly average



- Industrial gas demand still struggling.
- Improved renewables and nuclear power have reduced gas (and coal) in power generation.
- But residential and commercial gas demand reverting to pre-crisis behaviour

European storage fullness





Alice Casagni

The new market framework: changes in spreads and volatility



Impact on TTF: volatility

- 2022 : Uncertainty boosts volatility
 - Drop in Russian flows
 - Infrastructure limitations
 - Uncertainty around price levels
 - Regulatory changes
- 2024: Clearer fundamentals and regulation
 - Infrastructure developments
 - High LNG supply
 - New LNG supply deals
 - Big pieces of regulation being implemented





Volatility decreases but still above historical

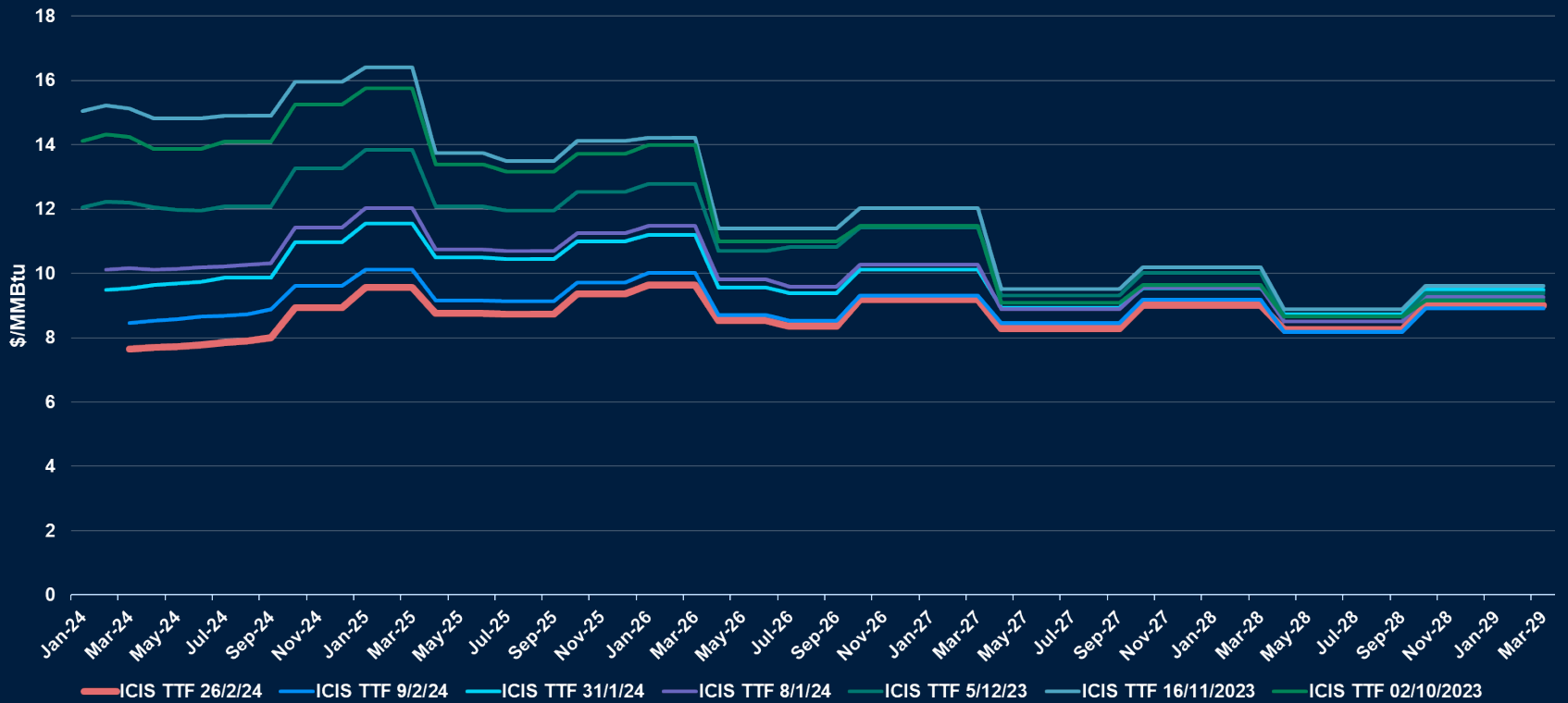
ICIS TTF Year 2025



- 2021 range: 14.425-24.95€/MWh;
- 2022 range: 23.9-126.13;
- 2023 range: 35.1-59.35;
- 2024 range: 27.6-35.83

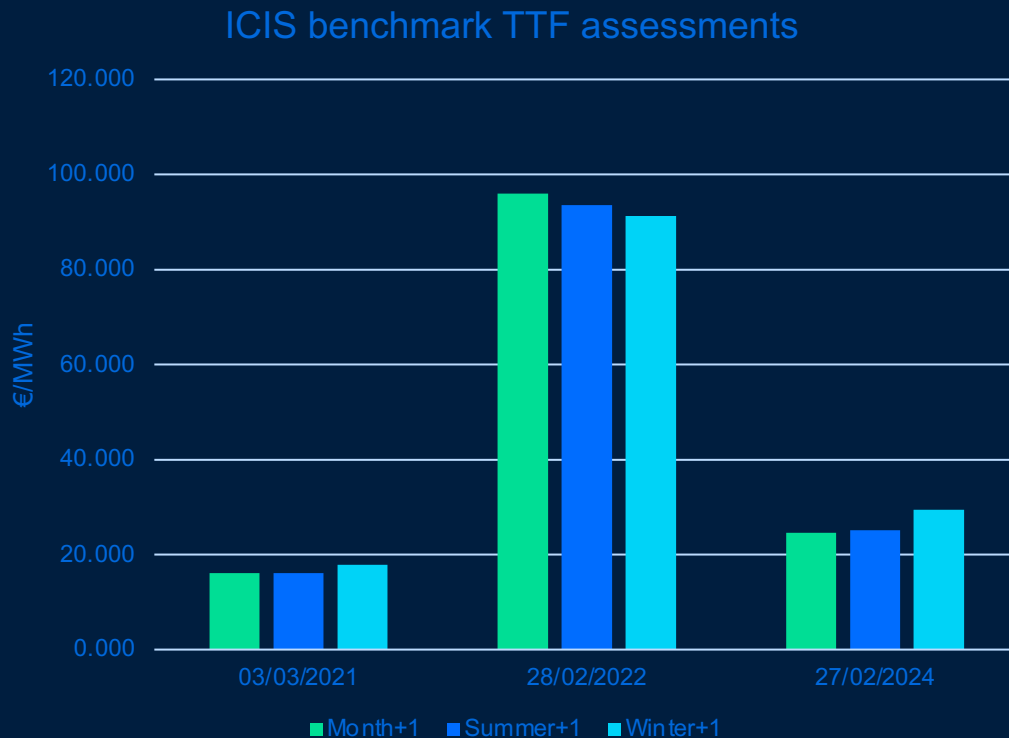


ICIS TTF forward curve flattens over winter





High stocks move risk premium to far curve

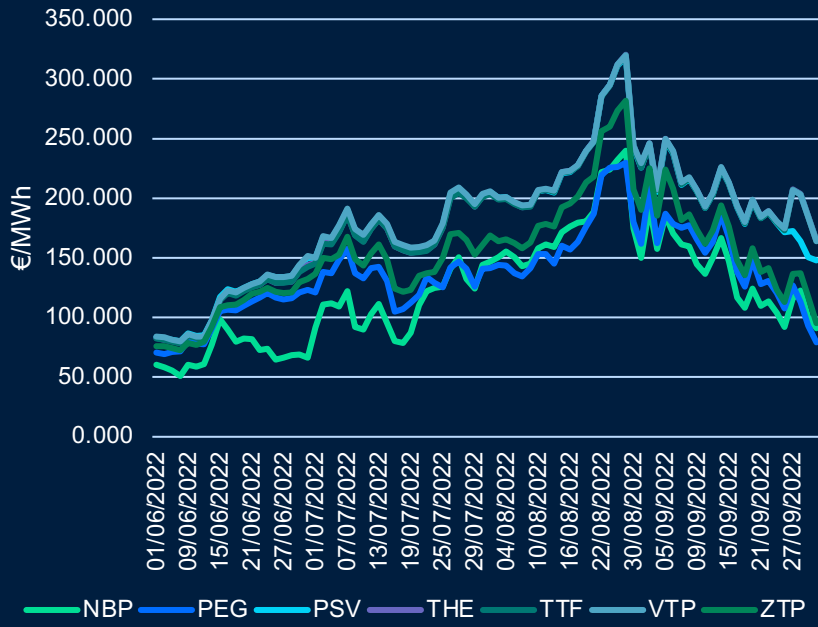


- Risk on contracts close to delivery dries out
- Keeping gas in stock is commercially profitable
- Full stocks cause seasonal spread to widen
- Different situation in 2022, where filling stocks amid climbing prices was not profitable

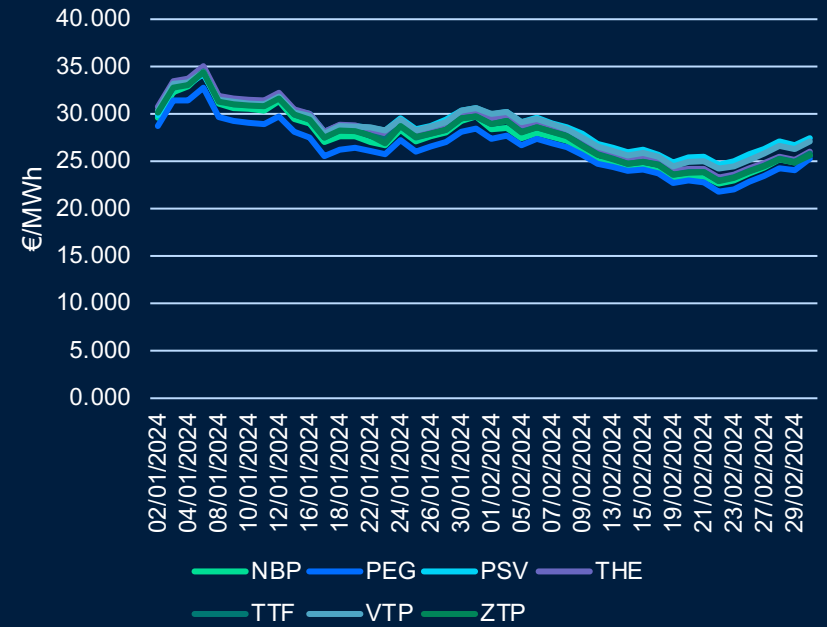
Hub prices converge after energy crisis



ICIS Month+1 assessments Q2 '22



ICIS Month+1 assessments Q1 '24

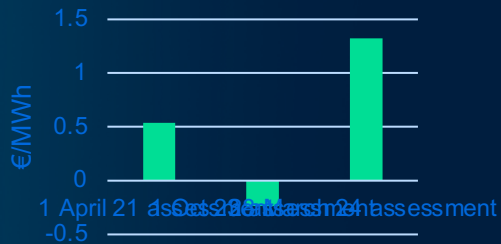


Locational spreads reflect new supply scenario



PSV-TTF front month

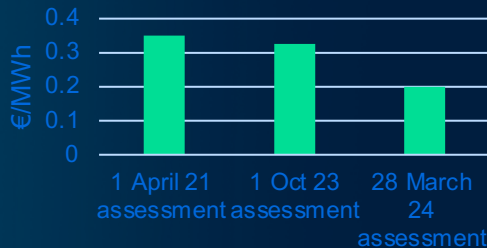
PSV-TTF front-month spread



- PSV prices decouple from TTF as Dutch exports to Italy via CH stop being the go-to marginal source
- Italian prices driven by LNG, Algerian supply and demand and storage dynamics

THE (NCG)-TTF front month

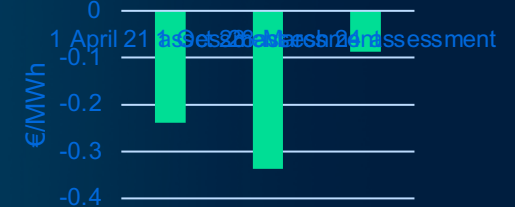
THE-TTF front-month spread



- THE premium to TTF decreases as new LNG infrastructure comes online making imports from NL less relevant but demand and storage still keep the price elevated

PVB-TTF front month

PVB-TTF front-month spread



- PVB discount eases as new LNG infrastructure in northwest Europe rebalances the market

European gas outlook for 2024



Price upside more limited than in 2022-23 but LNG availability and demand trends will play key role

Storage regulation will limit flexibility of stored gas

But high stocks weighs on TTF prices

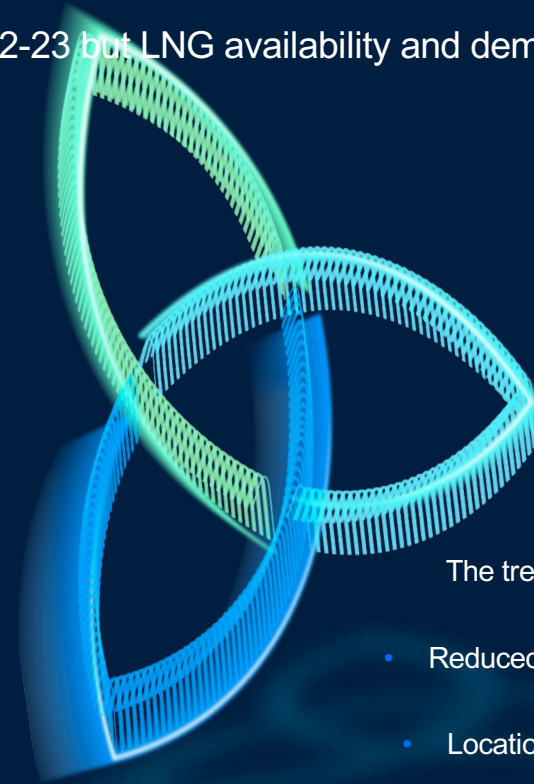
Demand trends will continue to be a major driver:

Questions on industrial demand recovery and weather

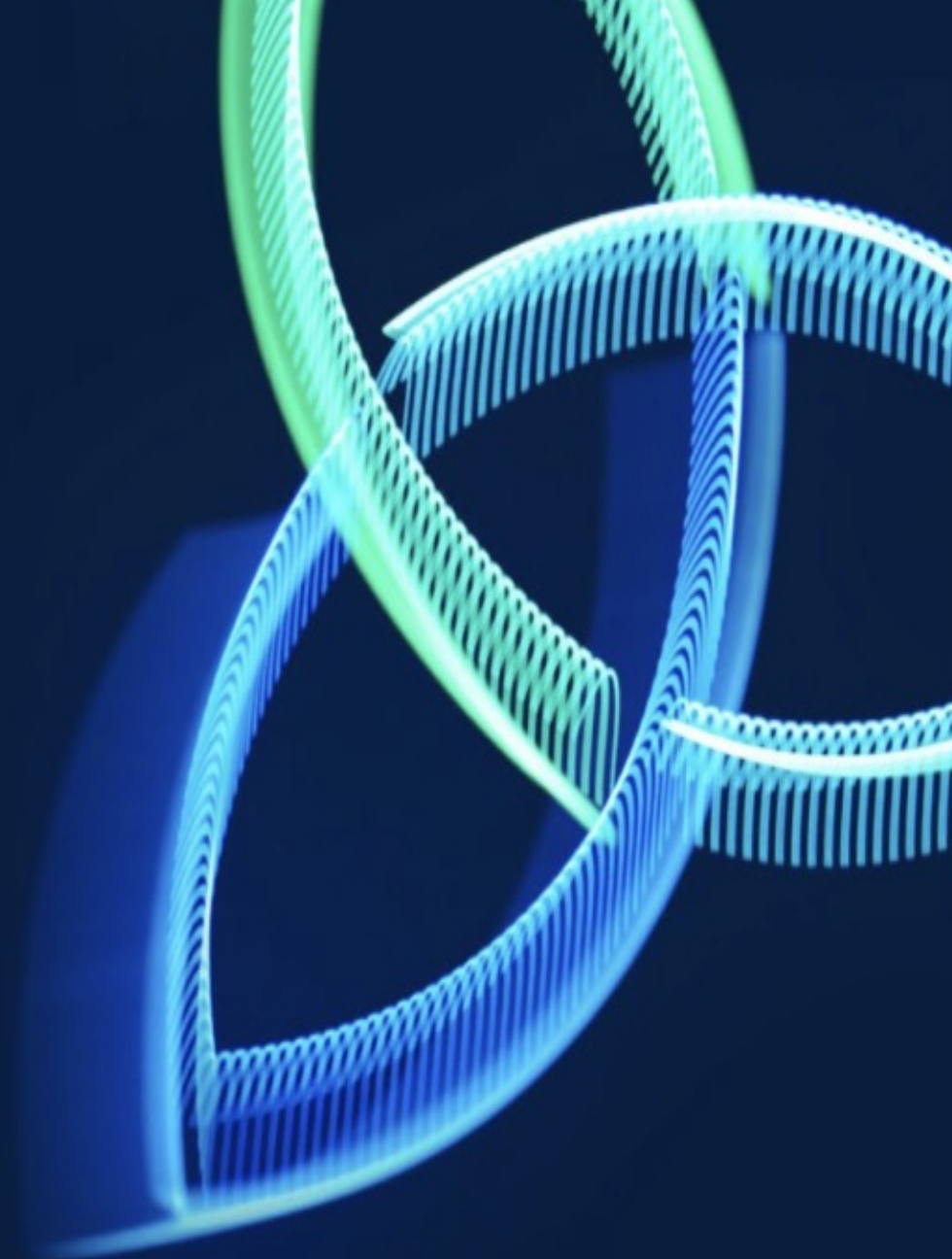
LNG availability will be key in driving European gas prices. Due to infrastructure developments, Europe's LNG import capacity is constantly increasing as is its dependence on it. This will make prices more subject to changes in global dynamics

The trend of growing liquidity on wholesale spot gas markets is expected to continue

- Reduced volatility and lower prices add to confidence across price curve
- Locational and time spread changes will continue to open up new opportunities.



Thank you





ICE European Gas Markets

Wouter de Klein
Senior Director, Utility Markets

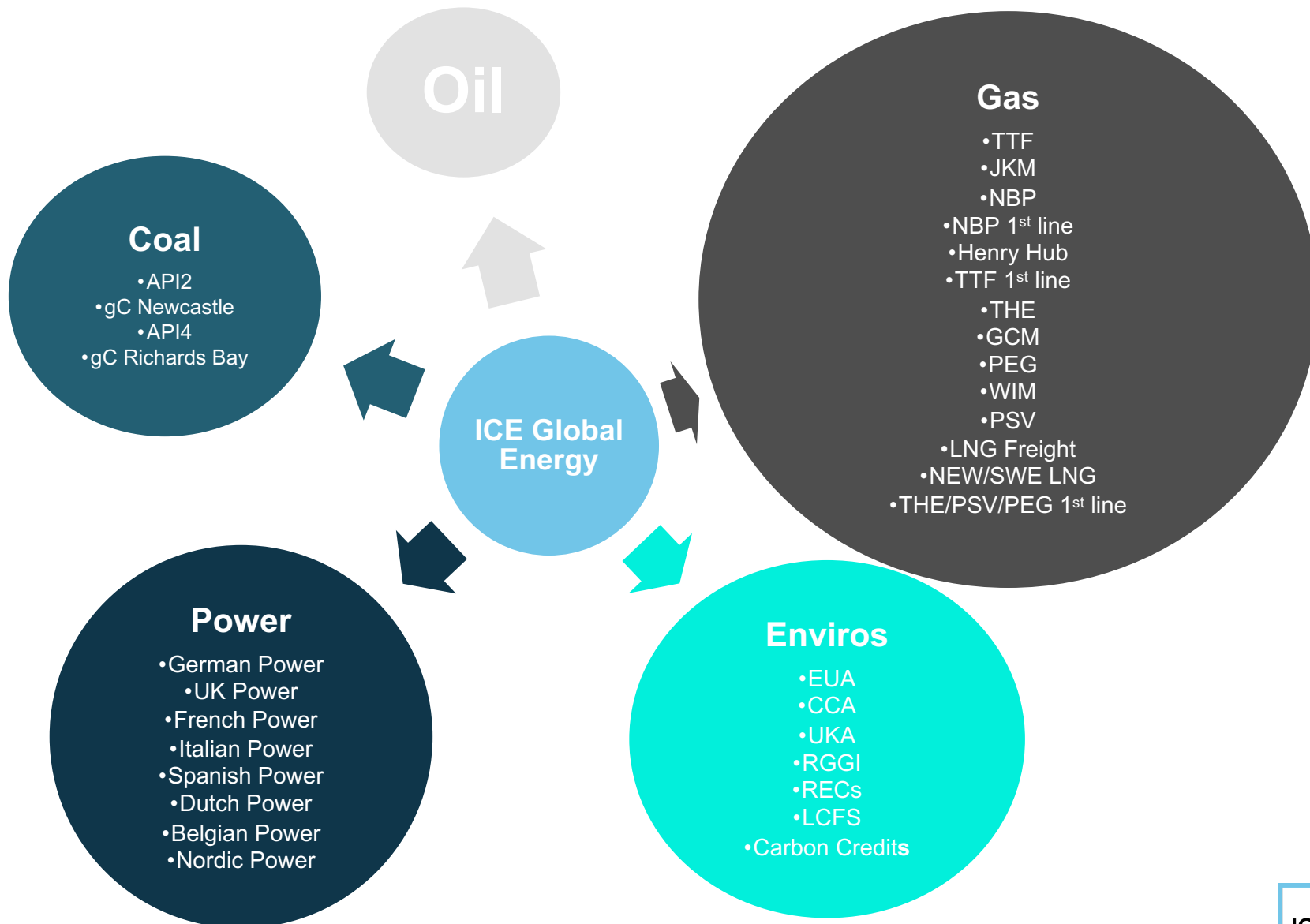
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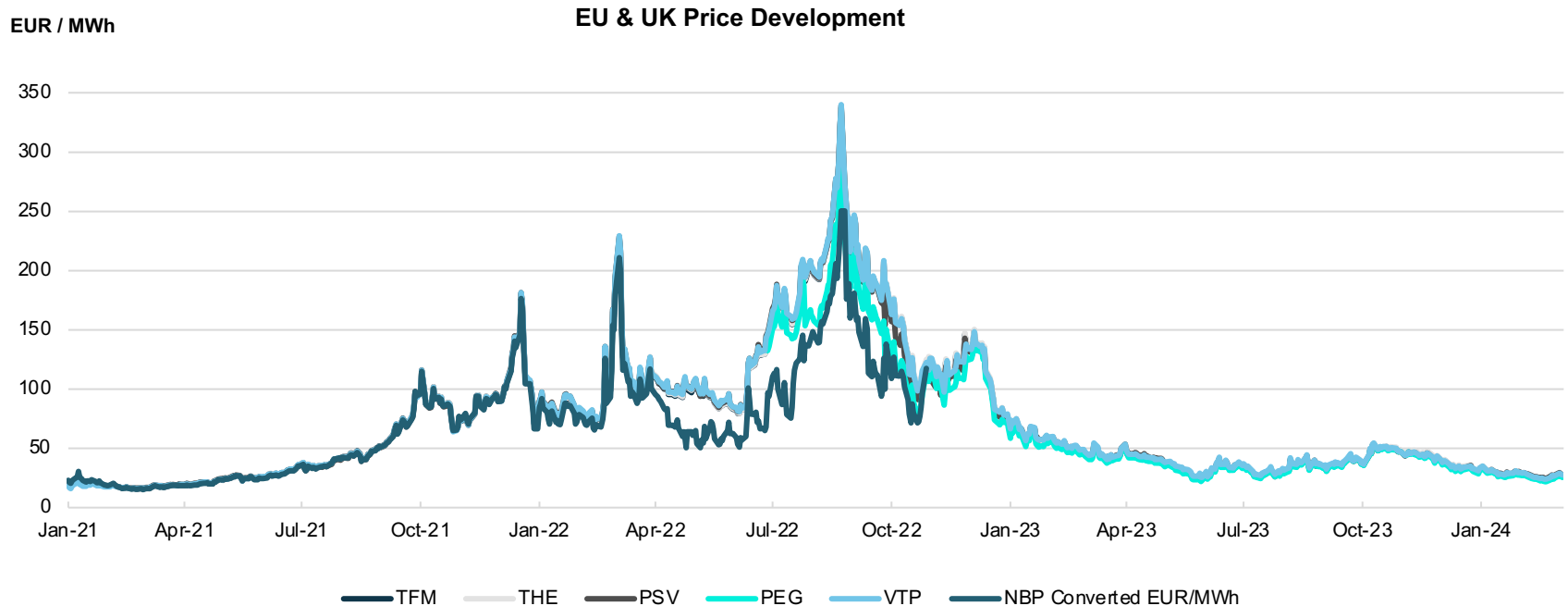
- Gas Market observations
- ICE TTF – at the center of global gas dynamics
- ICE EU Gas Portfolio – products & examples
- Q&A

ICE Utility Markets – summary of portfolio



Market observations 2023 – 2024 YTD

- Price convergence between EU Gas markets has returned to pre-2022 levels
- Fragile global geopolitical environment
- Very mild winter, stable gas supply and high volume of gas in storages led to bearish price trend
- Some European gas markets returning to pre-2022 trend of OTC (uncleared) trading
- Europe's gas storage levels Q1-24 YTD left much higher than the five-year seasonal average, around 60%
- Tight balance between liquefaction and regasification capacities in the global LNG market, and limited capacity additions expected in coming years.



Source: ICE.com

ICE European Gas portfolio

- > 540 active trading entities, trading from > 45 countries
- > 2,800 active users
- > 170 million lots traded in 2023, >75% screen execution across the portfolio; Q1-24 YTD ADV +29% vs. full year 2023
- 4,419 available strips to trade, ranging from Next Hour to Cal-33
- Total Open Interest of the portfolio of over 4.5 million lots YTD, up to and including December 2023; +37% vs. FY-23
- €71.9 billion notional value of O.I. in the portfolio in December 2023; Q1-24 at € 83.3 billion / +15%



ICE European Gas portfolio – some highlights

TTF Futures & Options

Q1-24 record quarter in ADV, daily participation and O.I.; screen execution of >86% in Futures

TTF Futures ADV +51% vs. LYTD; March '24 2nd highest monthly volume so far, O.I. at 1.82 mln lots > Dec. 2032

TTF Options ADV +86% vs. LYTD; January '24 highest monthly volume so far; O.I. at 2.03 mln lots > Dec. 2027

NBP Futures & Options

Q1-24 highest volume since Q1-21; NBP Futures ADV +56% vs. LYTD; record average daily participation in March

NBP Futures O.I. +32% vs. LYTD, at 312K lots > Sept. 2028

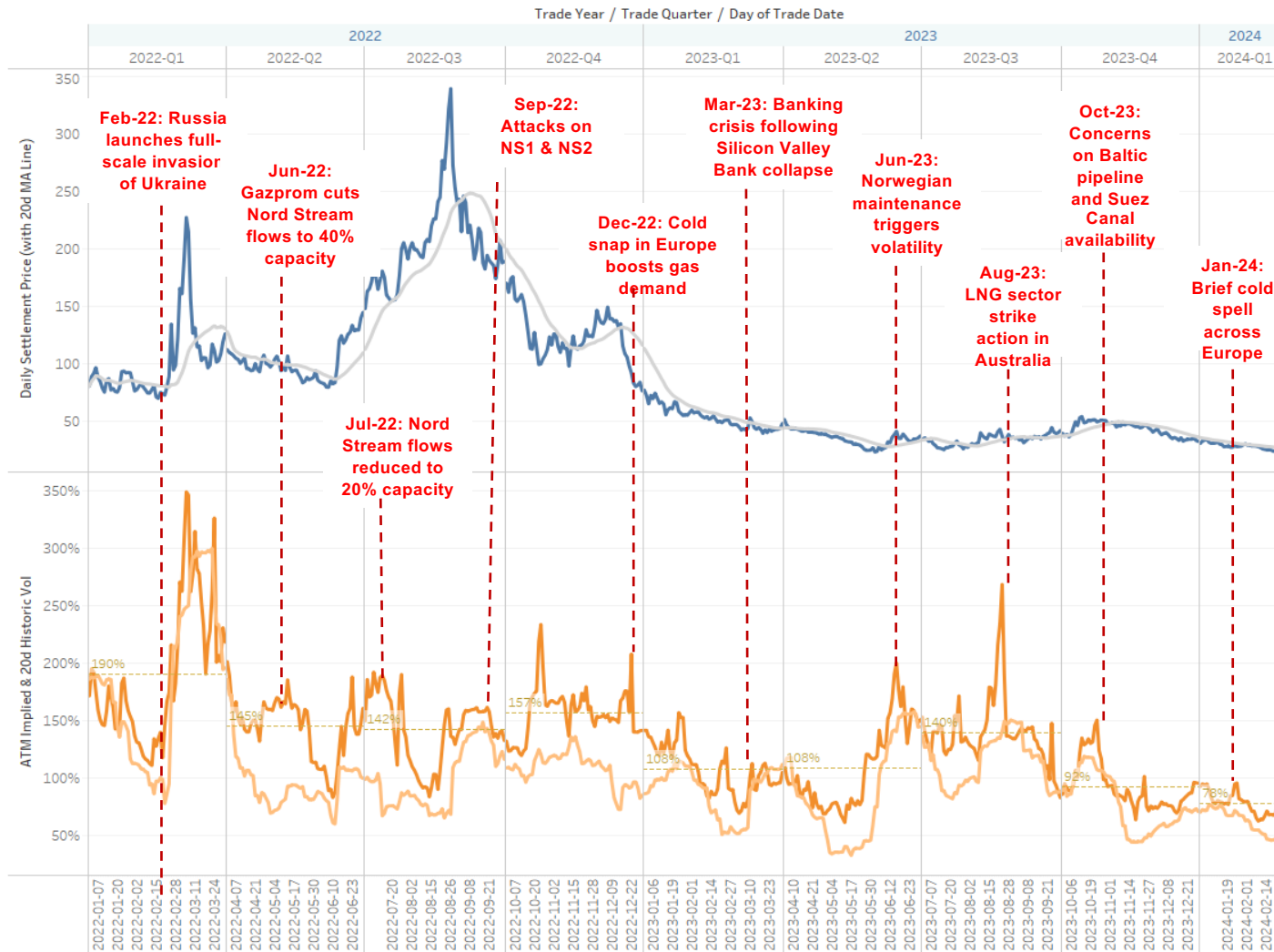
NBP Options ADV +45% vs. LYTD & Open Interest +105% vs. LYTD

Gas Balancing markets

OCM Q1-24 ADV +11% vs. Q1-23; trading participation +9% vs. Q1-23; operated by ICE since 2003

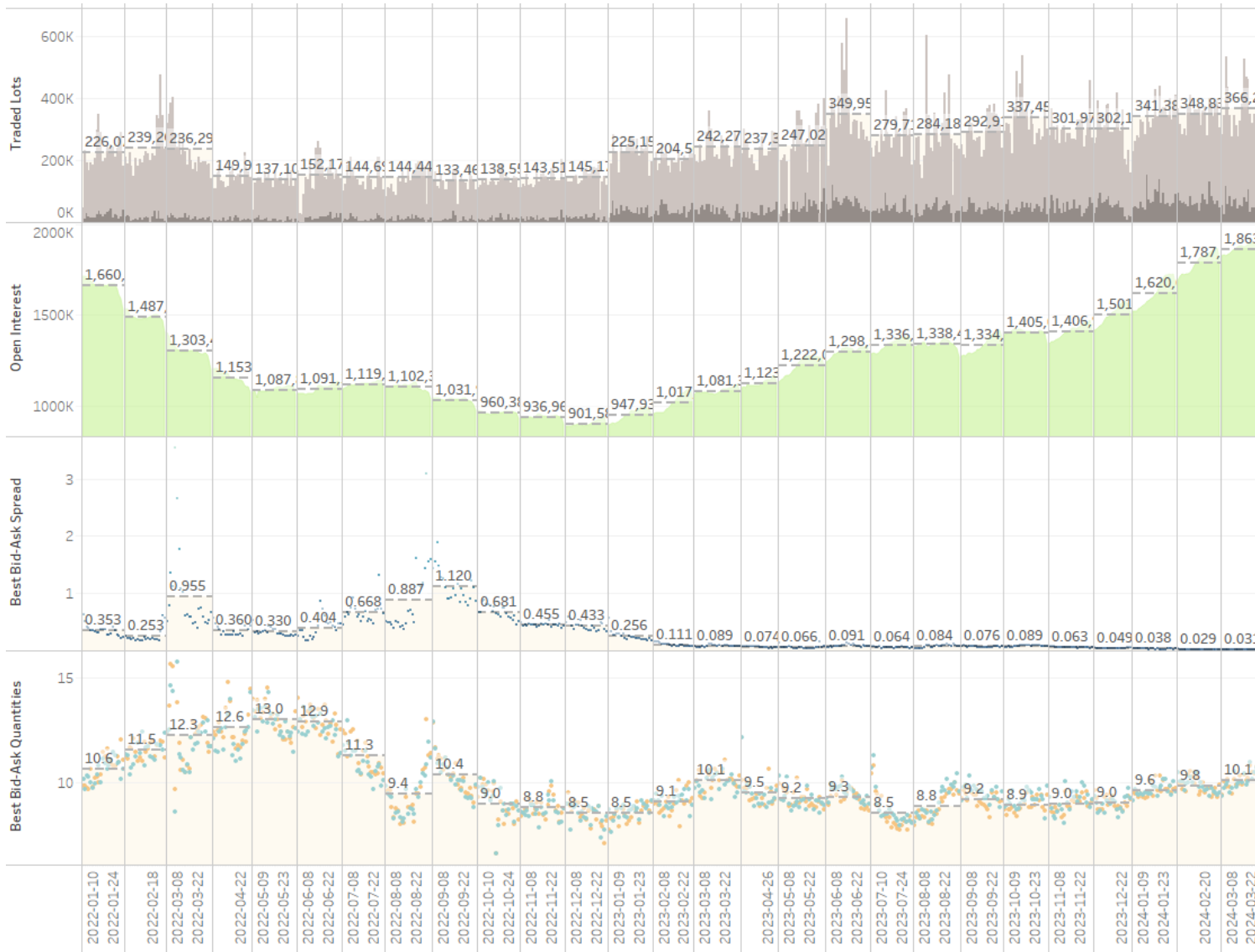
TTF Spot Q1-24 ADV +17% vs. Q1-23; trading participation +15% vs. Q1-23; operated by ICE since 2006

ICE TTF – at the center of global gas dynamics



Source: ICE.com

ICE TTF – Market activity summary



← New ADV records

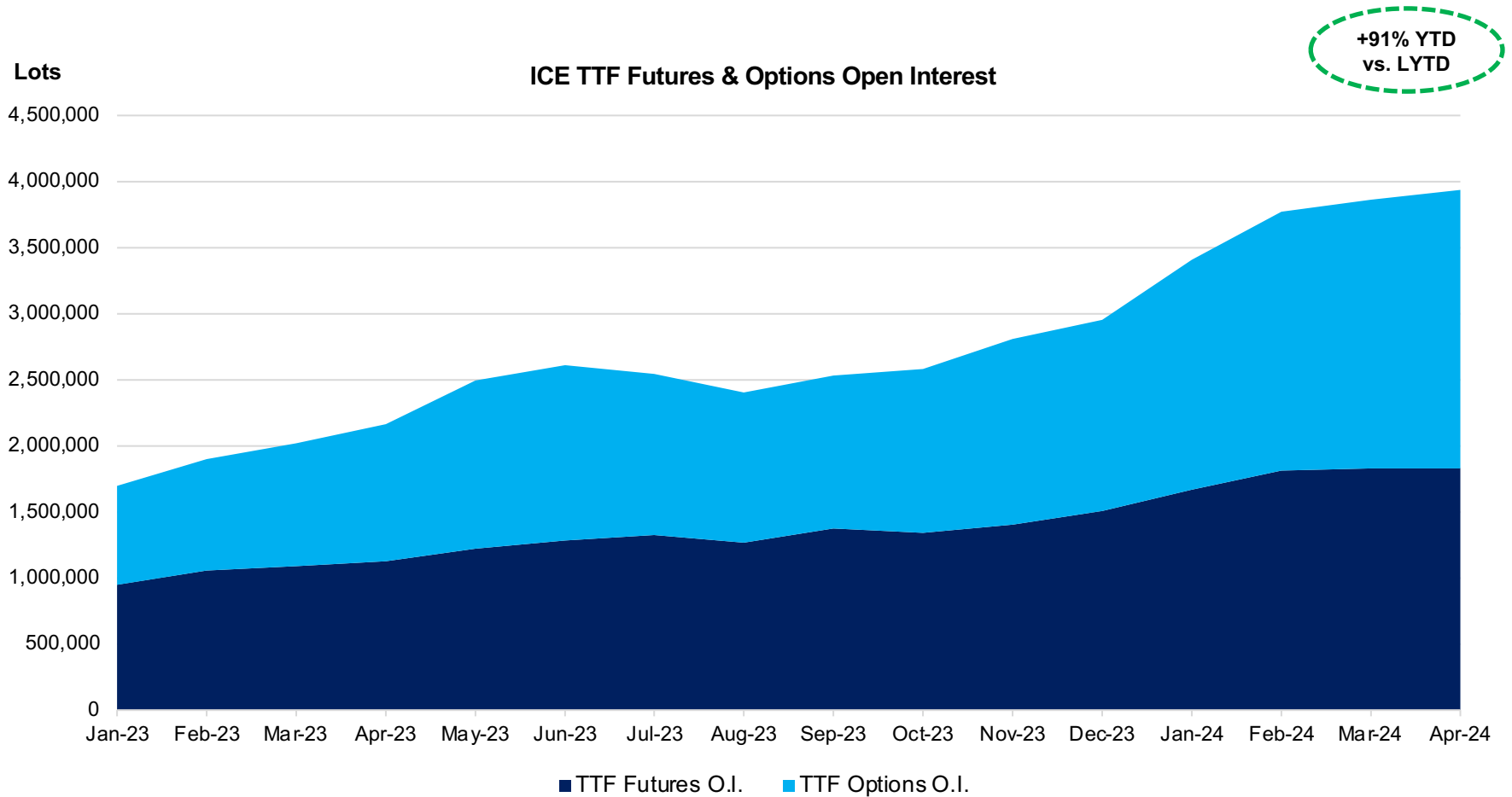
← Significant O.I. increase in Q1-24

← Avg. bid-ask spreads tightening

← Avg. bid-ask quantities increasing

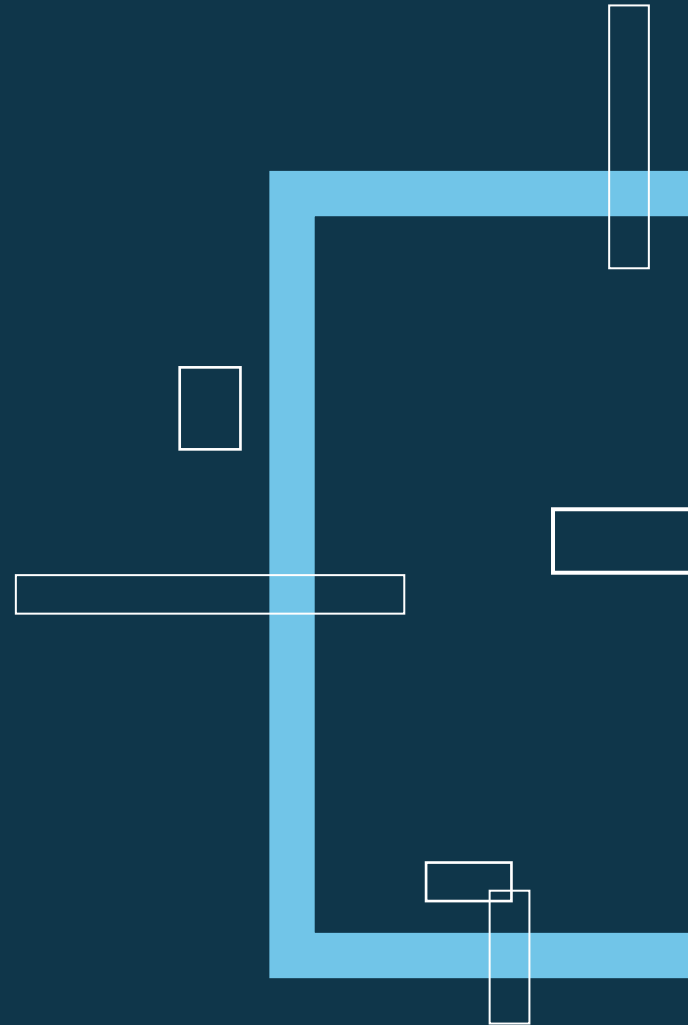
ICE TTF Futures & Options Open Interest

Longer term O.I. build up and overall O.I. growth across the curve > December 2032



Source: ICE.com

EU Gas products



ICE Global Gas

64 basis markets

235+ physical markets

Europe

Northwest Europe's natural gas markets are a crucial driver for balancing the LNG market, with their diverse energy supply and flexible infrastructure. ICE's **NBP** and **TTF** are the most liquid natural gas trading hubs in Europe.

North America

The Shale revolution has amplified the importance of **ICE's basis markets** as Henry Hub prices diverge from key Shale basins. Our 64 basis markets trade at prices reflective of regional supply and demand dynamics. North America's status as a key exporter of natural gas continues to strengthen.

Asia Pacific

Asia is driving global gas demand due to its fast-growing economies and environmental concerns. Our **JKM LNG** contract is the benchmark for natural gas across the region.

Key



ICE's Key NA Basis Markets

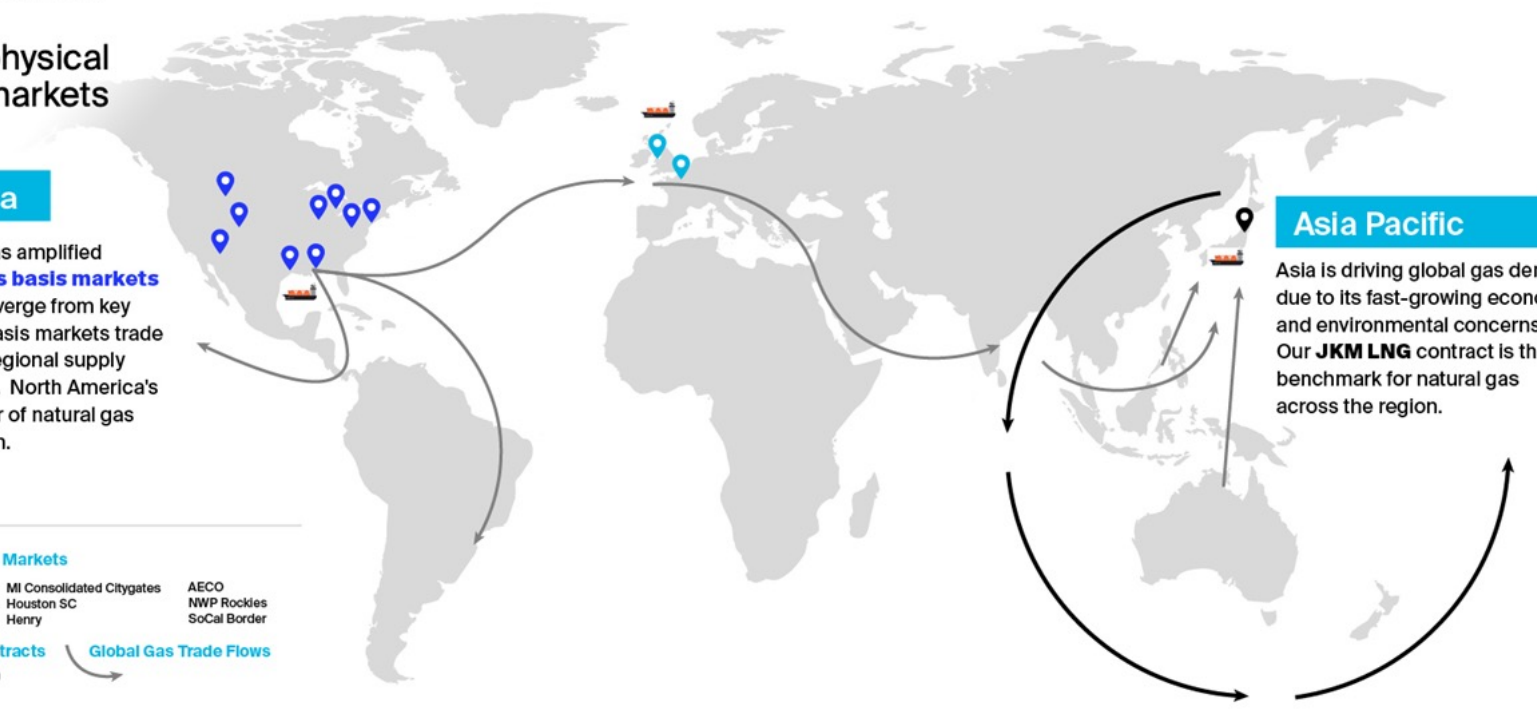
TETCO M3	MI Consolidated Citygates	AECO
Dominion South	Houston SC	NWP Rockies
Chicago Citygates	Henry	SoCal Border



ICE's Key LNG Contracts

Gulf Coast Marker (GCM)
TTF and NBP First Lines
JKM

Global Gas Trade Flows



ICE European Gas portfolio – products

European Gas

Time-and locational spreads

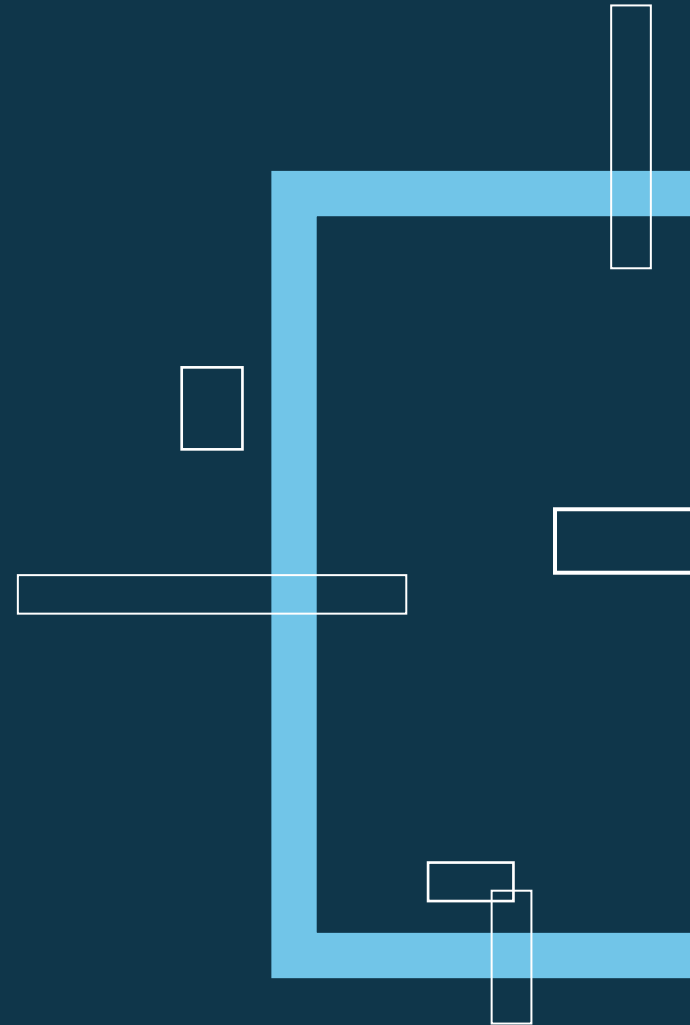
TTF	NBP	THE	PEG	PSV	VTP
Monthly Futures	Monthly Futures	Monthly Futures	Monthly Futures	Monthly Futures	Monthly Futures
Daily Futures	Daily Futures	Daily Futures	Daily Futures		Daily Futures
Daily Futures	Daily Futures	Daily Futures	Daily Futures	Daily Futures	
Spot	Spot				
Options	Options	Options			

35 **Physically settled**

Financially settled (ICIS)



EU Gas examples



Order pricing and settlement types

Order pricing

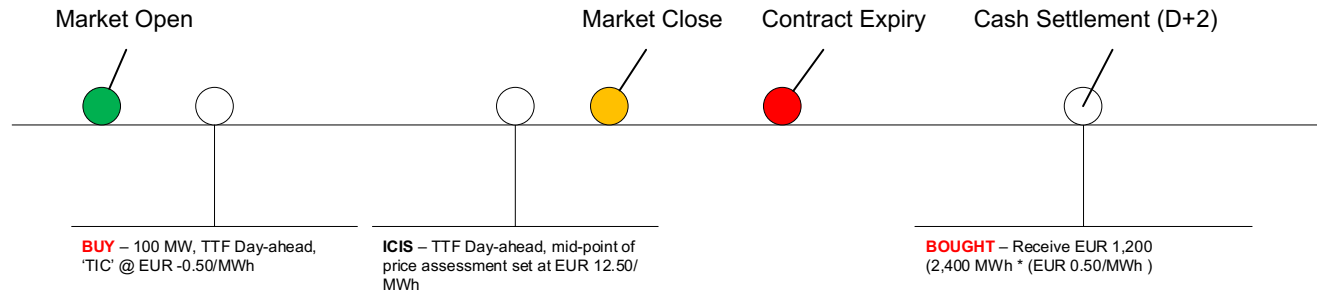
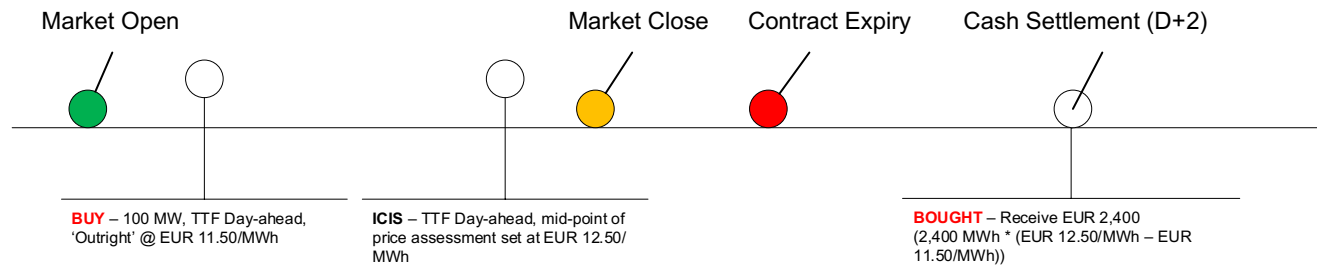
- **Outright**
- **Trade At Settlement (TAS)**
- **Trade At Index Close (TIC)**

Settlement types

- **Physical delivery**
- **Financial settlement**

Financially settled daily futures contract

Example of outright pricing of TTF Natural Gas Daily Financial Futures (ICIS) contract (TTL)



Swap physical for financially settled contract

A market participant with a position in physically delivered Dutch TTF Gas Futures (TFM) can decide to:

Close their position before contract expiry

Take their position to physical delivery

Roll their position to the next maturity

Swap their position in physically settled Dutch TTF Gas Futures (TFM) for financially TTF Natural Gas Daily Financial Futures (ICIS) (TTL)

Swap their position in physically settled Dutch TTF Gas Futures (TFM) for physically settled Dutch TTF Daily Gas Futures (TFE)

Or

Or

Or

Or

Swap physical for financially settled contract II

Example of a swap of physically for financially settled TTF futures:

A market participant is long 50 lots in Dutch TTF Gas Futures (TFM), May-24 contract (expires 29 April 2024 EOD)

The market participant executes a swap between Dutch TTF Gas Futures (TFM) and TTF Natural Gas Daily Financial Futures (ICIS) (TTL) contracts.

SELL 50 lots Dutch TTF Gas Futures (TFM), May-24 contract – effectively closing position before expiry, and

BUY 50 lots TTF Natural Gas Daily Financial Futures (ICIS) (TTL), May-24 contract (month of daily futures) - opening the same position

The swap can be achieved by trading on screen or by registering a Block Trade

The market participant can manage its position in TTF Natural Gas Daily Financial Futures (ICIS) (TTL) by trading the contract or allowing the individual daily futures to expire and take cash settlement instead

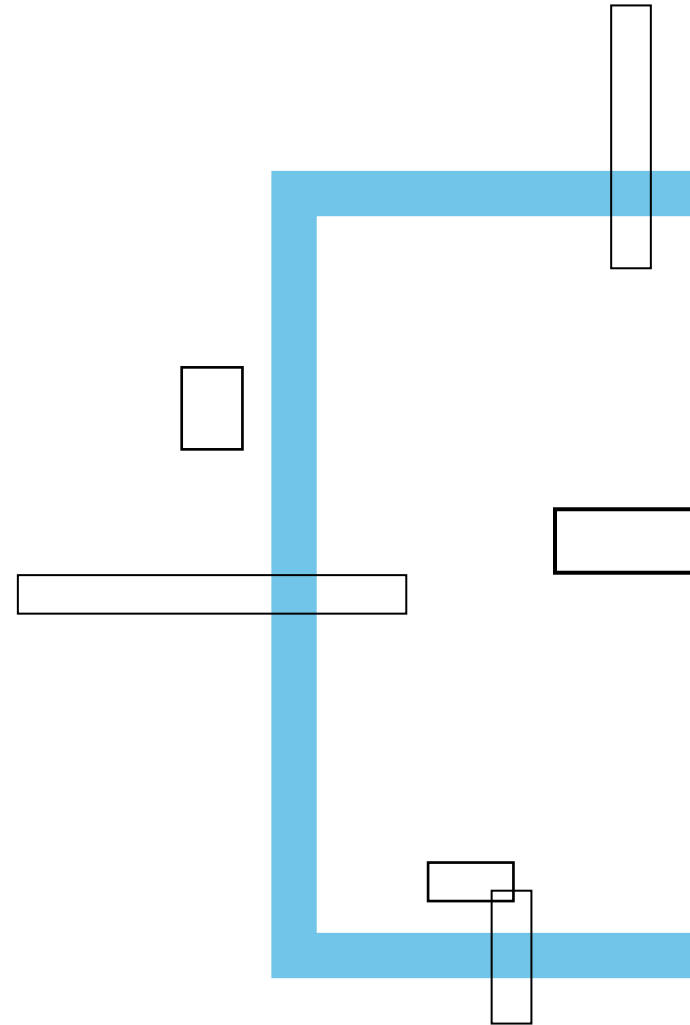
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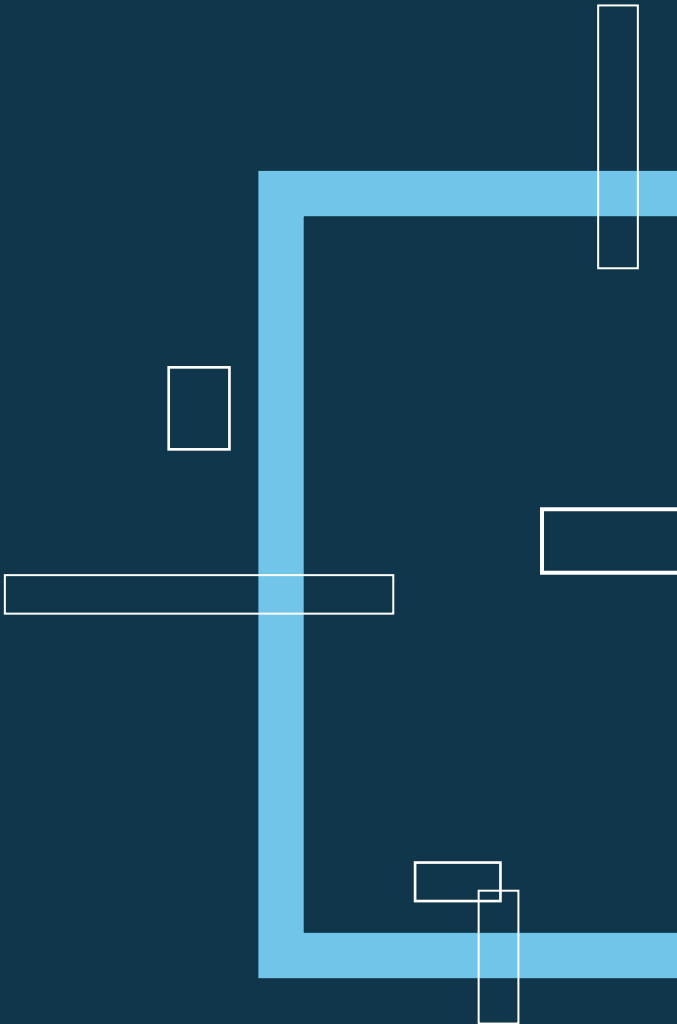
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Q & A



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