

Price developments of global LNG in the coming decade

How can US – and other – LNG be competitive with other gas supply sources in Poland?

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We help clients using our deep industry insight to:

- Run more effective businesses
- Launch new businesses and reach new markets
- Understand and navigate industry change

We have worked with energy companies across:

- Strategy and regulation
- Energy market analysis
- Operating model design
- Operational excellence
- Back office transformation
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We bring Valuable, deep industry experience We have an award-winning culture that attracts the brightest people

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62 Partner

Offices worldwide



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- Commodities Traders
- Asset Investors and Private Equity

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Presentation Overview



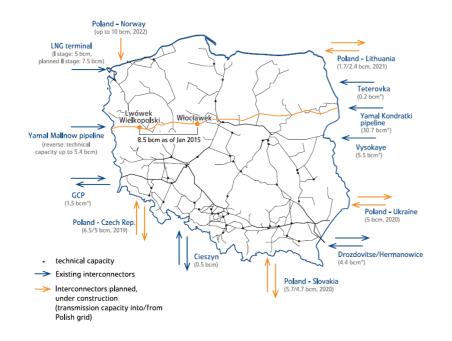
How can US – and other – LNG be competitive with other gas supply sources in Poland?

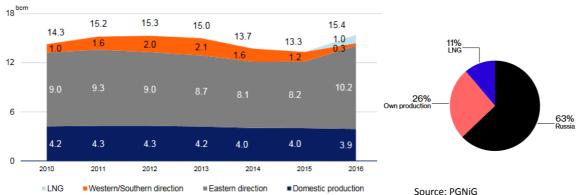
- 1. Setting the scene: what does the next decade look like?
- 2. A quantitative and qualitative comparison of LNG and pipeline gas
- 3. Conclusions

Setting the scene: Poland's gas supply



Historic reliance on Russian imports increasingly challenged





- c. 17 Bcm market in 2016
- Reliant on Russian gas imports since 1944
- Oil price linkage
- Increased market liberalisation in Europe, new infrastructure projects create supply alternatives
- Advent of LNG has increased diversification of gas supply
- LT contract with Qatargas, other shorter deals
- ▲ Long-term supply contract with Gazpromexport expires in 2022

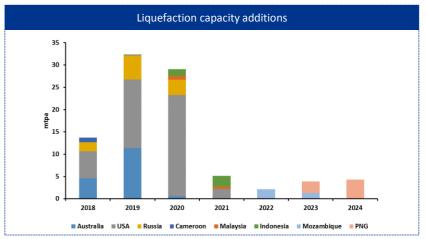
Setting the scene: global LNG



US LNG – both existing and new – will be a key part of the next decade

Global LNG in the next decade

- ▲ Demand growth driven by Asian and emerging LNG markets
- Supply growth continues for next three years before slowdown –
 US >50% of capacity under construction
- ▲ US LNG available in coming years on spot/short-term basis
- ▲ New FIDs needed as demand outstrips supply in 2020s
- Non-US LNG projects of low-enough cost will use TTF as price benchmark to secure FID
- May trigger higher spot prices



Source: Baringa

US projects well-placed to meet supply / demand gap						
Emerging LNG supply-demand gap MTPA (DES)	Project Stage	Projects	mtpa	Bcm/yr		
500	Operating / Under Construction	6	70.9	97.7		
400	Fully Permitted (Major Projects)	4	68.9	95.0		
200	Fully Permitted (Small Projects)	N/A	9.0	12.4		
100	Formal FERC Review	11	146.9	202.6		
0	FERC Pre-Filing	2	24.0	33.1		
2000 2005 2010 2015 2020 2025 2030 2035 ■ LNG supply in operation ■ LNG supply under construction ■ Demand forecasts	Total	23	310.7	428.5		
Source: Shell	Source: FERC					

New LNG projects

- US LNG projects well-placed to contribute
- Also other proximate projects likely to supply Europe (Mozambique, West Africa)
- Timing uncertain
- Downward pressure on costs
- New commercial models emerging

For example: comparing US LNG and Russian pipeline gas



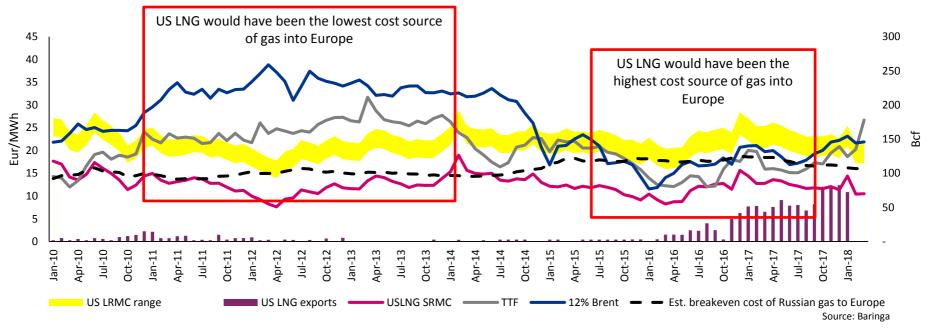
Apples and apples?

US Supply				
Type • LN	NG		Russian Supply	
	cisting, under construction and potentially new LNG	Market trends and evolution	Туре	Pipeline gas
	port plants; LNG ships;	▲ Demand uncertainty in Europe	Means of delivery	 Existing export pipelines
	egas facilities oot, short-term, mid-term	▲ Increased globalisation of gas – global drivers impact price, risk, opportunity	Contractual basis	via Ukraine or BelarusLong-term; ToP
•	nd long-term	Toward commoditisation	V V	20116 (21111) 101
_	S gas price (i.e. HH or ostream supply) cost +	Buyers seeking greater flexibility, self- determination	Pricing basis	 Historically, oil-linked – transition to (TTF) market-pricing?
	ariable (DES v. FOB)	Capability development amongst buyers, suppliers	Delivery Point	Poland
value chain ald	opportunities to invest all ong value chain	Increased short-term and spot trade (albeit driven off diversion of LTCs)	i onsii company	• Buyer
participation		 Europe as global swing market 	value chain participation	
(he • Hig	oss-index pricing edging?) gh fixed cost versus end- arket pricing		Risks	 Unknown price adjustments (i.e. via price review)
inc	arrec pricing			p

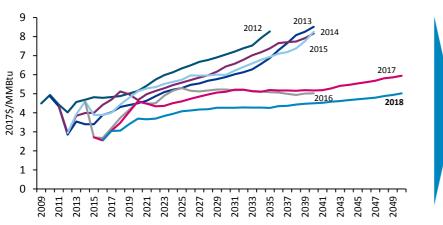
Can US LNG compete with pipeline gas on cost?



Competiveness of US gas on cost-basis is dependent on a range of market drivers



Source: EIA



- EIA Henry Hub price projections demonstrate downward trend
- Liquefaction costs being aggressively challenged in second wave of US LNG historic median of \$3.00/MMBtu (and high of \$3.50/MMBtu) v. new projects looking for closer to \$2.00-\$2.50/MMBtu
- As new gas supply needed globally to meet demand, market prices will need to rise to support investment decisions

Conclusions



US LNG will be in the money, and sometimes it will be out. Commercial contracting strategy must be flexibly designed to address this

- **▲** US LNG cost competitiveness into Poland is driven by a number of external factors, for example:
 - Gas cost: LT US cost of production continue to decline
 - Liquefaction cost: new wave of supply projects are aiming to be significantly cheaper than first wave
 - Pricing of Russian gas (i.e. Brent and / or TTF or towards cost of production...). Settlement with DG Comp may affect this.
 - Value of inherent flexibility via access to higher value markets.
 - US LNG's inherent flexibility allows for value to be added when global LNG markets are short and greater value can be achieved elsewhere (likely in the next 10 years)
- **▲** Key for Polish buyers to engage actively in identifying and executing appropriate type of contracting
- An initial list of considerations:
 - A long-term deal reflective of fully-built-up costs is going to look different to a deal to buy existing LNG which will be priced according to global conditions (down to SRMC)
 - Drive to FID and intense supply project competition provides buyers with opportunity
 - Business model choices/commercial approach (including pricing) need to reflect risk appetite and view of the external factors
 - Key determinant of competitiveness of US LNG is:
 - Cost management
 - Organisational development to maximise inherent value of LNG supplies



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