Potential & Conditions for LNG in the EaP

Executive summary

- Ukraine is dependent on gas imports for 1/3 of its total needs
- The need for gas imports, including LNG, will remain for at least 5 years
- Global LNG supplies are increasing over the last 5 years, particularly in Asia and Europe
- Unfortunately, LNG cannot be delivered directly to Ukraine because there are no LNG terminals in Ukraine
- Ukraine can source LNG that comes to European terminals
- Deliveries from the Polish LNG terminal are the most realistic and technically feasible option
- Ukraine has political and economical motives to support development of LNG projects in order to diversify its gas imports

Overview of Naftogaz Group

Naftogaz is a vertically integrated group

Naftogaz of Ukraine	Headquarter, Trading
Ukrgazvydobuvannya (100%)	Gas upstream, processing
Ukrtransgaz (100%)	Gas transmission & storage
Ukrspetstransgaz (100%)	LHG railway transportation
Gas of Ukraine (100%)	Retail supply until 2012
Ukravtogaz (100%)	CNG retail (stations)
Naftogaz Trading Europe S.A. (100%)	Trading (Switzerland)
Kirovohradgaz (51%)	Gas distribution & supply
Chornomornaftogaz* (100%)	Oil and gas upstream
Naftogaz Trading (100%)	Trading (Ukraine)

Ukrnafta (50%+1 share)	Oil upstream
Ukrtransnafta (100%)	Oil transmission & storage
Ukrtatnafta (43 % share)	Oil processing &storage
Petrosannan Company (JV, Egypt)	Oil&gas upstream
Zakordonnaftogaz (100%)	Oil&gas upstream
Naukanaftogaz (100%)	R&D
Vuhlesyntezgaz of Ukraine (100%)	Development of gas replacement projects
LIKVO (100%)	Prevention of emergencies
Naftogazbezpeka (100%)	Security service company
Ukrnaftogazkomplekt (100%)	Supply of equipment

Naftogaz Gas Business

Upstream, gas processing

- **16,6** bcm gas produced
- **230+** oil, gas, condensate fields
- **39** gas processing plants

Gas transportation & storage

- **153 bcm** transit capacity to Europe
- **86,8** transit in 2018
- **31 bcm** underground storage

Wholesale gas trading

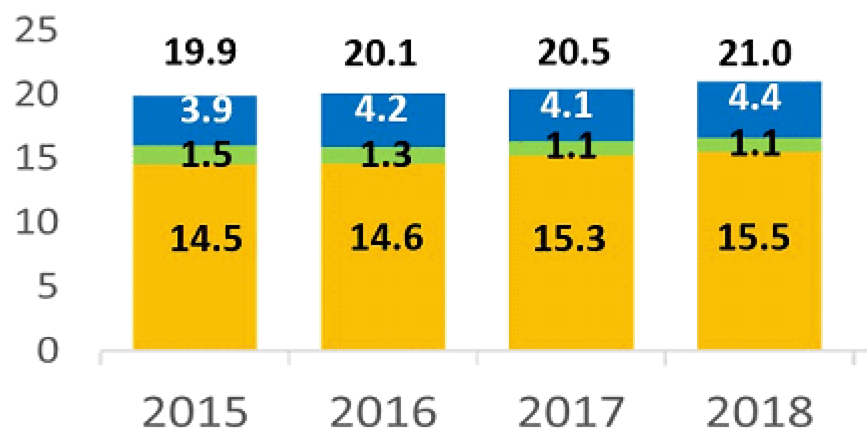
- **66 %** market share in imports
- **79 %** market share in gas production

Gas production

2018 results: Ukraine increased gas production by 500 mcm

Gas production in Ukraine, 2015-2018

bcm



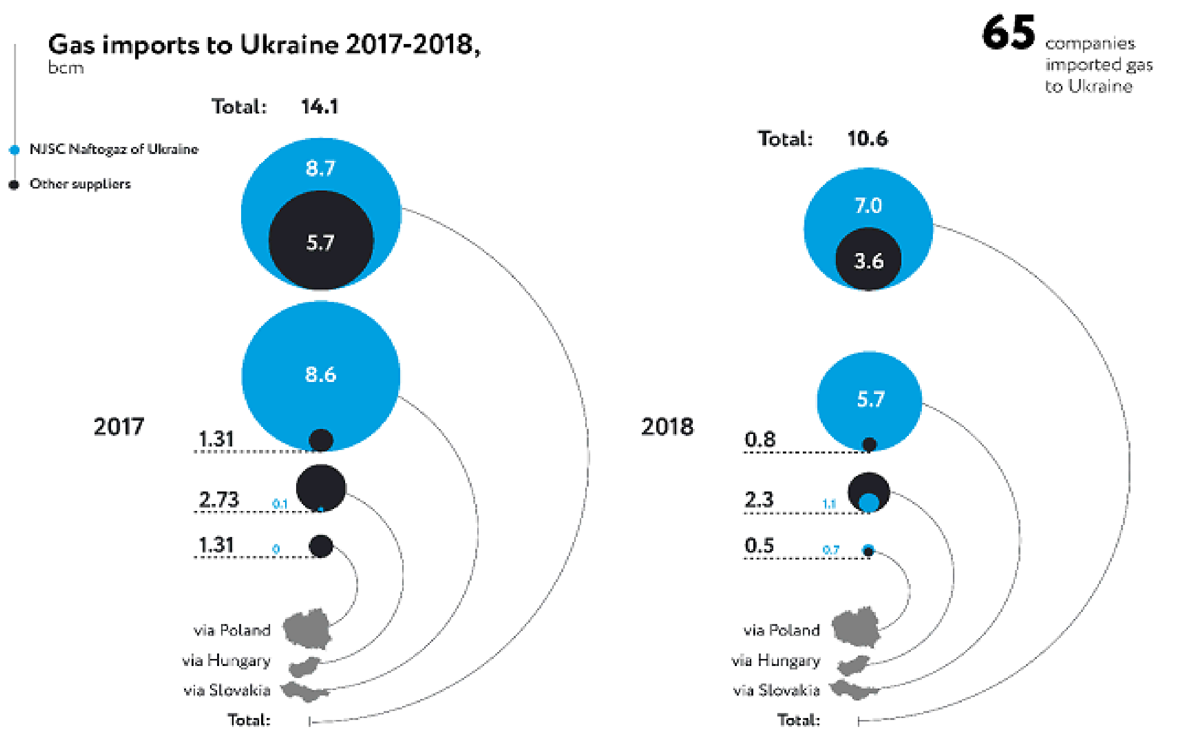
	2015	2016	2017	2018
Private producers*	3.9	4.2	4.1	4.4
JSC Chornomornaftogaz*	0.01	0.01	0.01	0.01
JSC Ukrnafta*	1.5	1.3	1.1	1.1
JSC Ukrgazvydobuvannya*	14.5	14.6	15.3	15.5
Total	19.9	20.1	20.5	21.0

**Gross production (incl. private producers where UGV holds a minority stake; incl. operating needs)*
2018 data are preliminary and may be updated
Sources: Naftogaz, Energy Ministry, State Statistics Service

- UGV, a 100%-owned subsidiary of Naftogaz, produced 15.5 bcm of gas (73.8% of Ukraine's total production). This amount includes gas used for the company's operating needs.
- Chornomornaftogaz, a 100% subsidiary of Naftogaz, produced 10.3 mcm of gas in 2018, which is 200 tcm less compared to 2017 (10.5 mcm). The company has been developing the Strilkove field in the Azov Sea, which supplies Henichesk town in Kherson region.
- Ukrnafta maintained its gas production at 1.1 bcm, comparable to 2017 levels.
- Private companies increased production by 7.3% from 4.1 bcm in 2017 to 4.4 bcm in 2018.

Gas import to Ukraine

From November, 2015, Ukraine stopped direct gas purchases from Gazprom.
Since then, Naftogaz has been collecting fuel on the basis of reverse deliveries carried out on gas connections with Poland, Slovakia and Hungary.

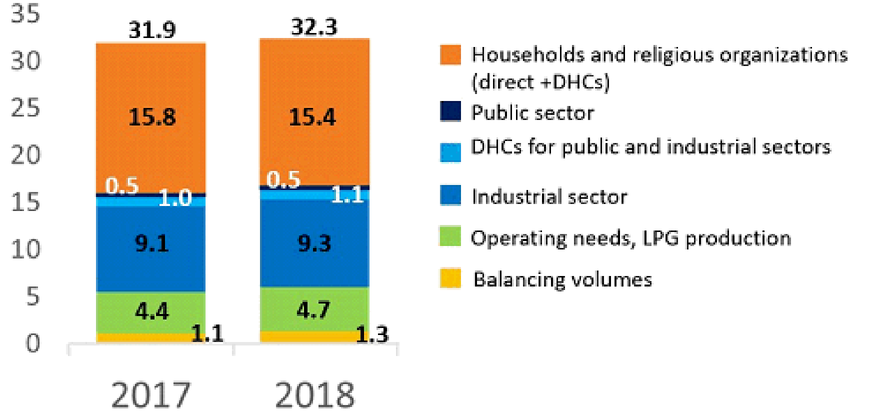


	2017	2018	+/- %
Total:	**8.7**	**7.0**	**-19.5%**
from Russia	0.0	0.0	
from the European market, total	8.7	7.0	-19.5%
via Slovakia (Budince GMS)	8.6	5.7	-33.7%
via Hungary (Beregdaroc GMS)	0.1	1.1	
via Poland (Hermanovice GMS)	0.0	0.2	

- Both Naftogaz and private companies decreased their imports – from 8.7 bcm to 7 bcm (-19.5%) and from 5.4 bcm to 3.6 bcm (-33.3%) respectively.
- In total, 65 companies imported gas to Ukraine in 2018 (compared to 67 companies in 2017).
- Naftogaz purchased gas from 18 European suppliers in 2018 (13 companies in 2017). None of them accounted for more than 30% of gas imported by Naftogaz.
- Naftogaz has not been buying gas from Russia's Gazprom since November 2015. Gazprom has refused to comply with the Stockholm arbitration award regarding volumes and conditions of supply under the contract with Naftogaz.

Gas balance in Ukraine

Gas consumption in Ukraine, 2017-2018 bcm



2018 data are preliminary and may be updated
Sources: Naftogaz, Ministry of Energy and Coal Industry of Ukraine, State Statistics Service of Ukraine

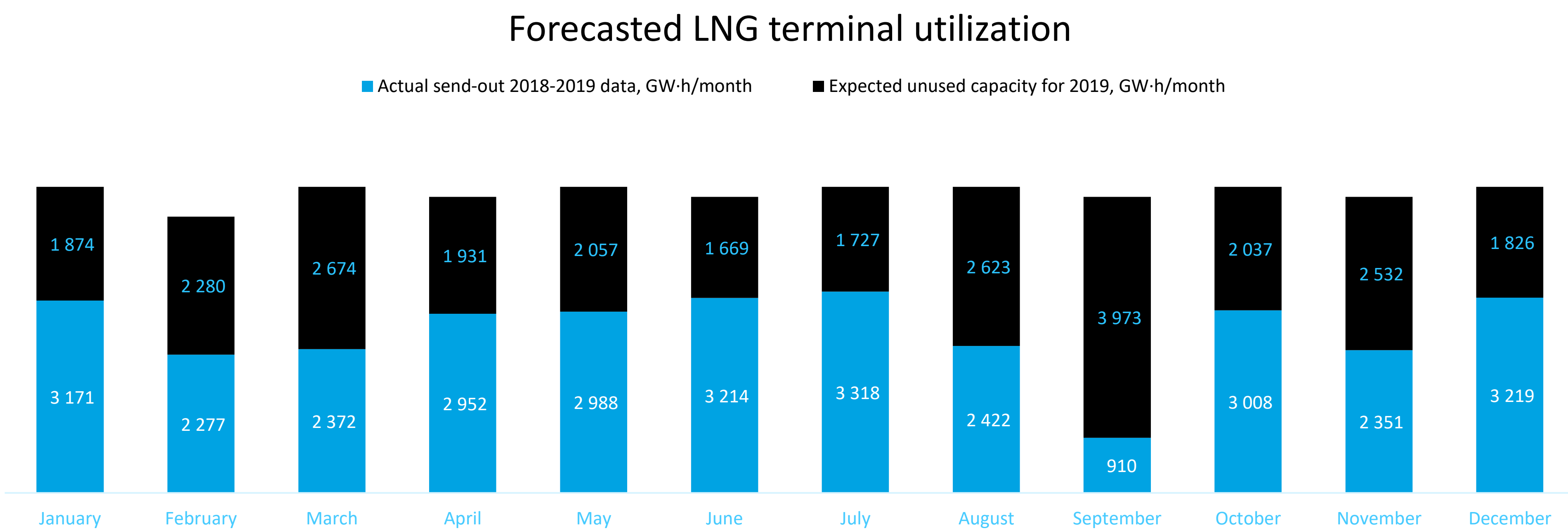
Gas consumption in Ukraine, 2017-2018, bcm

Consumer category	2017	2018	+/- %
Households	11.2	10.6	-5.4%
District heating companies (DHCs):	5.6	5.9	+5.4%
for households	4.6	4.8	+4.3%
for public and industrial sectors*	1.0	1.1	+10.0%
Religious organizations (direct + DHCs)	0.019	0.02	+5.3%
Regulated segments total*	**16.8**	**16.5**	-1.8%
Public sector	0.5	0.5	0%
Industrial sector	9.1	9.3	+2.2%
Operating needs (gas production, transmission and distribution), LPG production	4.4	4.7	+6.8%
Unregulated segments total*	**14.0**	**14.5**	+3.6%
Unauthorized offtake, unrecorded volumes, balancing	1.1	1.3	+18.2%
Total	**31.9**	**32.3**	+1.3%

- In 2018, Ukraine's gas consumption remained relatively stable increasing by 0.4 bcm (1.3%) to
- 32.3 bcm compared to 31.9 bcm consumed in 2017.

- Gas consumption in regulated market segments totaled 16.5 bcm against 16.8 bcm in 2017.
- Household consumers used 10.6 bcm of gas in 2018, which is 0.6 bcm less than in 2017 (5.4% decrease).
- DHCs used 4.8 bcm of gas to generate heat for households, which is 0.2 bcm more than in 2017 (4.3% increase).
- Unregulated market segments increased their gas consumption by 0.5 bcm from 14.0 to 14.5 bcm.
- Industrial users increased consumption by 0.2 bcm to 9.3 bcm.
- Gas used for operational needs of production, transmission and distribution companies as well as LPG production grew by 0.3 bcm from 4.4 to 4.7 bcm.
- The growth in this category was attributable to the production enhancement activities implemented by UGV in 2018.

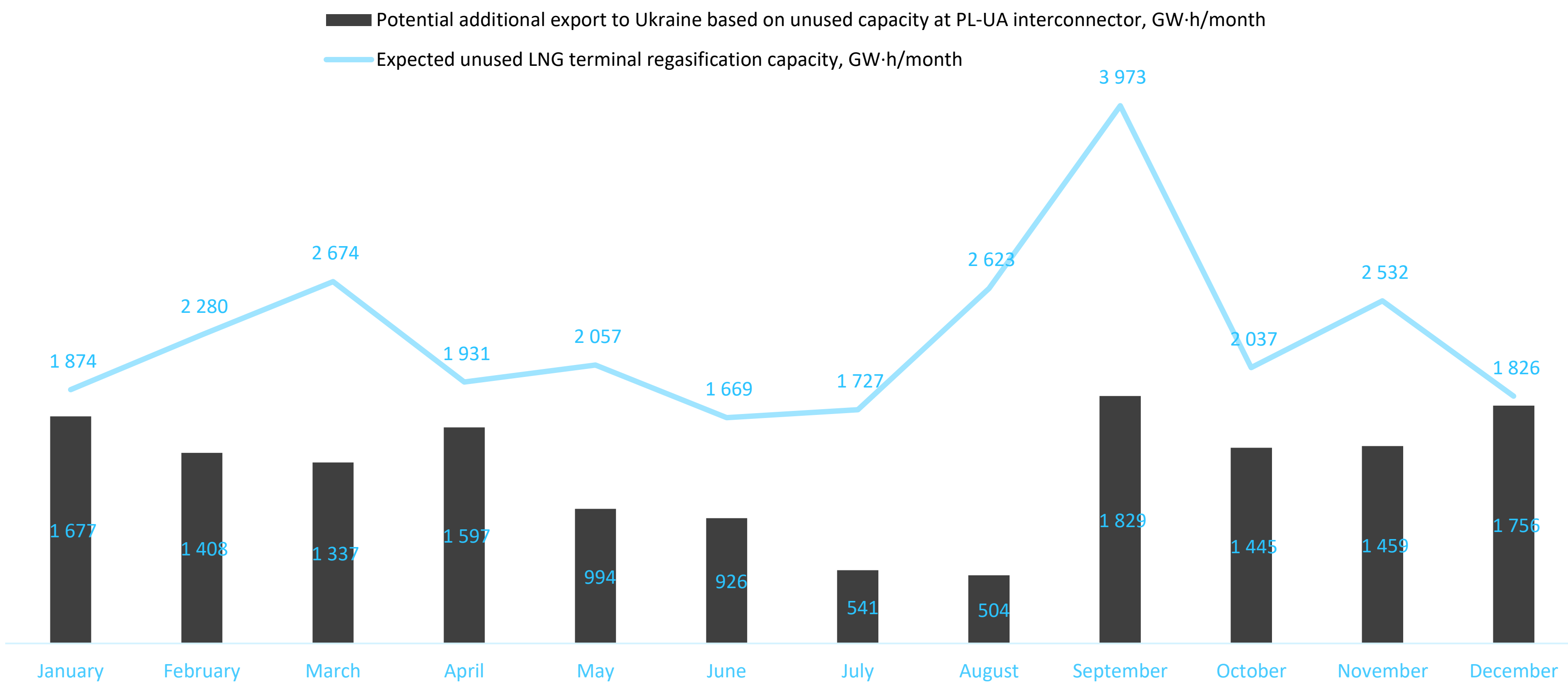
Current potential for LNG imports to Ukraine from LNG Terminal in Świnoujście



With current rate of LNG terminal utilization there is still room for around 27 TW·h (2.5 bcm) of additional gas send out

Current potential for LNG imports to Ukraine from LNG Terminal in Świnoujście

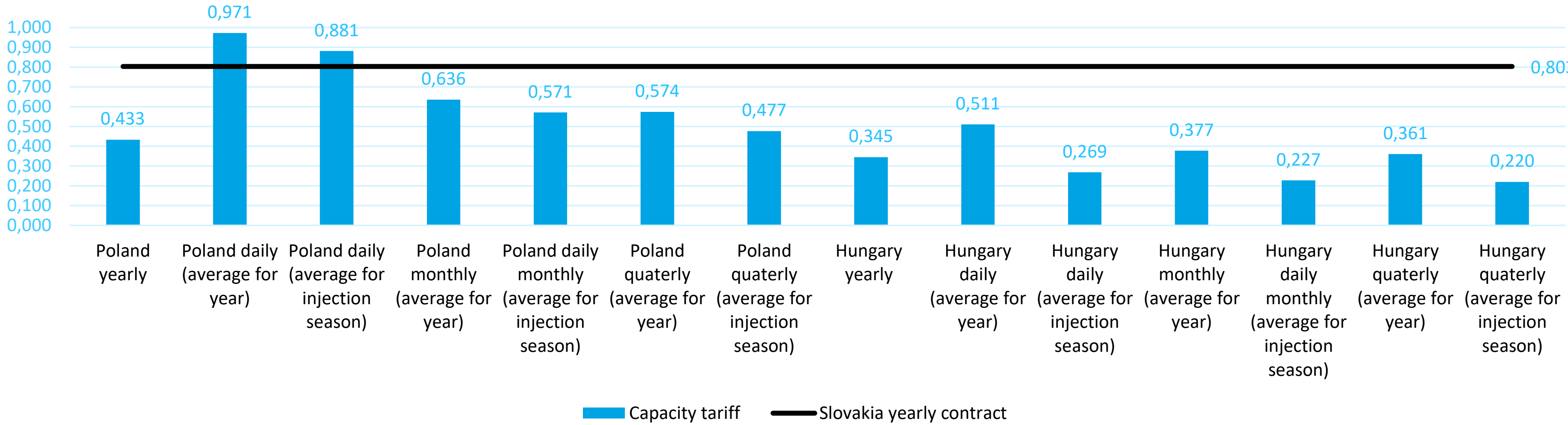
Potential additional exports to Ukraine based on PL-UA interconnector and LNG terminal unused capacity



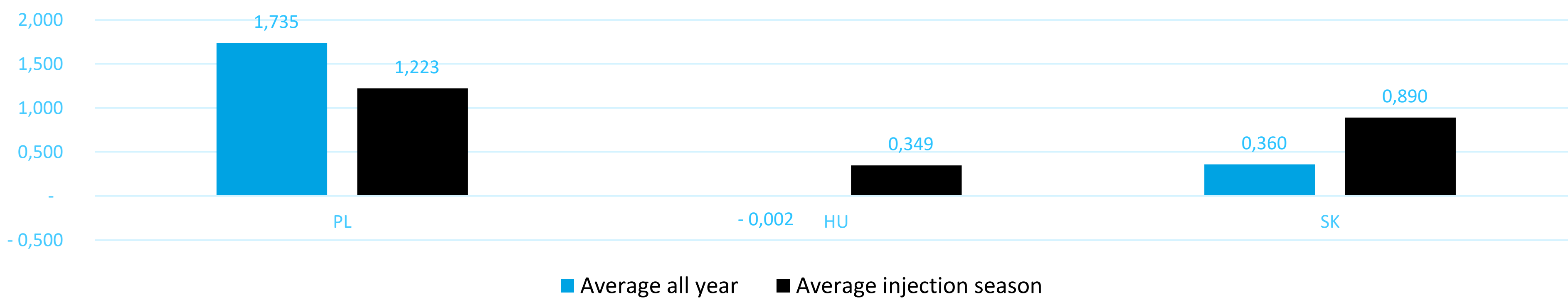
Potential exports to Ukraine can further raise the utilization of the terminal by additional 15,5 TW·h (1,5 bcm) up to 80% (yearly average) compared to last observed level of 54%

Capacity costs as one of the main drivers of summer gas flows to UA

Exit costs on interconnection points with Ukraine's neighbours depending on duration and season of booking, €/MW·h



DaH quotes spread to NCG quotation

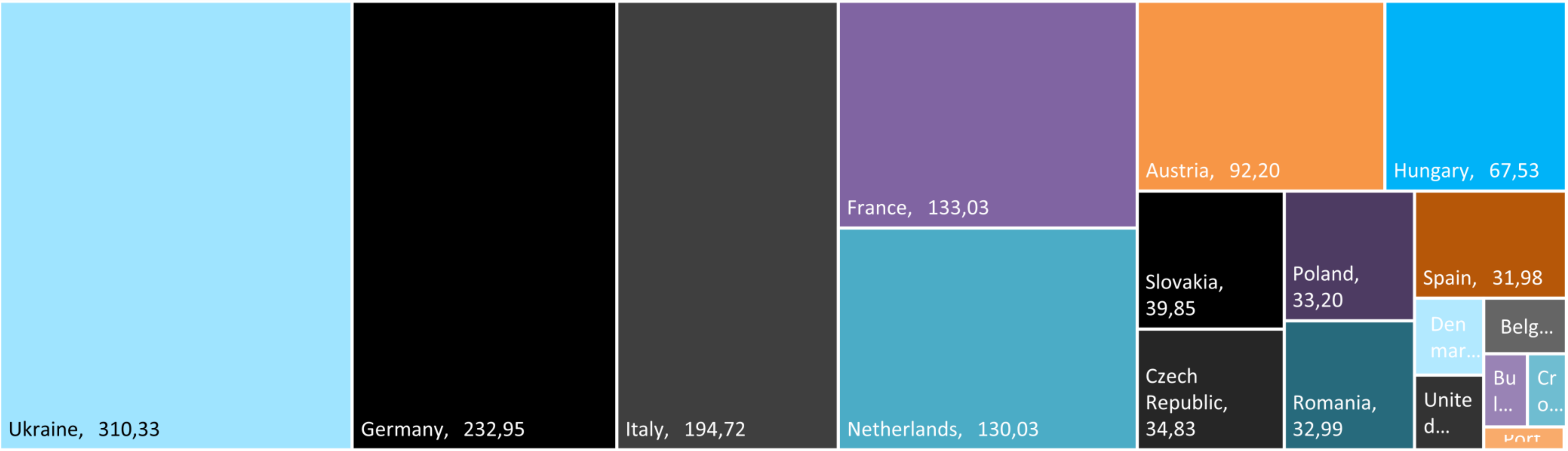


Price comparison UA imports/Henry hub prices

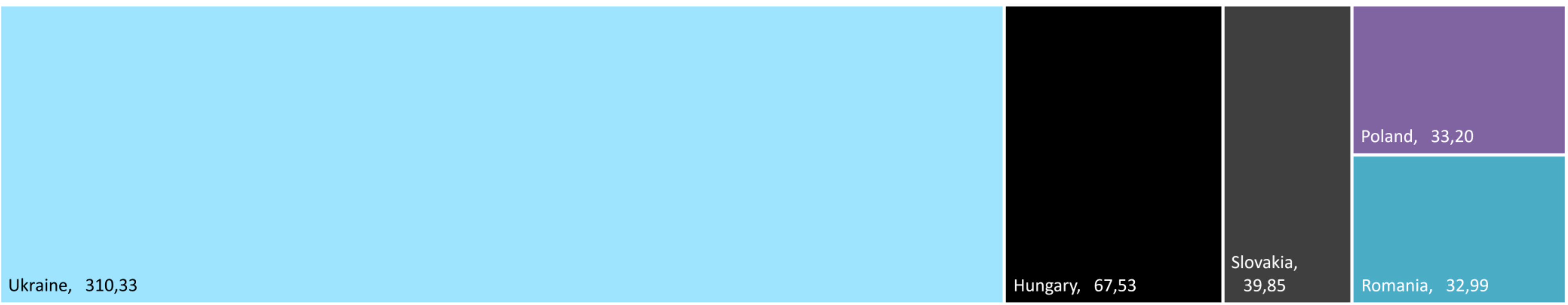
Delivery month	UA natural gas import price, USD/MMBtu	Estimated competitive price at LNG terminal send out gate, $/MMBTU			Henry hub MaH based price, $/MMBTU	Henry hub premium at terminal gate, $/MMBTU		
		Daily	Monthly	Quaterly		Daily	Monthly	Quaterly
January 18	7,657	7,249	7,394	7,410	2,759	4,490	4,635	4,651
February 18	7,591	7,218	7,325	7,340	3,167	4,051	4,158	4,173
March 18	8,570	8,182	8,319	8,319	2,661	5,521	5,658	5,658
April 18	7,189	6,861	6,971	7,017	2,698	4,163	4,273	4,319
May 18	7,364	7,039	7,169	7,199	2,720	4,319	4,449	4,479
June 18	7,985	7,696	7,792	7,822	2,820	4,876	4,972	5,002
July 18	7,925	7,626	7,732	7,762	2,944	4,682	4,788	4,818
August 18	8,415	8,119	8,224	8,254	2,789	5,330	5,435	5,465
September 18	8,943	8,654	8,750	8,780	2,909	5,745	5,841	5,871
October 18	9,379	9,062	9,174	9,160	2,880	6,182	6,294	6,280
November 18	9,097	8,751	8,866	8,881	3,206	5,545	5,660	5,675
December 18	8,791	8,410	8,545	8,574	4,037	4,373	4,508	4,537

UA gas storages – one of the biggest opportunities for LNG trading in CEE

Ukrainian storages compared to other EU storages,TW·h



Ukrainian storages compared to immediate neigbours, TW·h



Thank you