

U.S. LNG FOR UKRAINE

Towards regional markets integration



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U.S. LNG FOR UKRAINE: CURRENT DEVELOPMENTS

Over the last five years the United States has become one of the top global LNG producers and exporters, currently being the third biggest supplier in the world. The U.S. LNG industry growth is facilitated not only by its competitiveness, but also by both formal and informal support from the side of the U.S. administration, including its diplomacy. And that is also the case regarding the possible LNG supplies to Ukraine.

The first ever shipment of the U.S. LNG had been received by the Ukraine-based company ERU Trading as early as December, 2017 (the cargo was regasified in Świnoujście LNG Terminal in Poland) and the next two years has brought more declarations and statements from the all of the three sides involved.

As for now, the letter of intent has just been signed between the Ukrainian government and U.S.-based Louisiana Natural Gas Exports for the LNG supplies amounting up to 6-8 bcma of natural gas (around 4,5-6 mtpa of LNG).

The possible deal could ultimately make U.S companies cover +/- 20 per cent of the Ukraine's gas consumption (excluding occupied part of Donbass and Crimea) and even more than the half of the country's gas imports (the volume as for 2019). And as the Ukrainian vice-minister of energy and environmental protection, Konstantyn Chyzhyk, stated: U.S. LNG could supply not only Ukraine's domestic market but could also be stored in Ukrainian gas storages and be

further re-exported to the other Central-Eastern European countries.

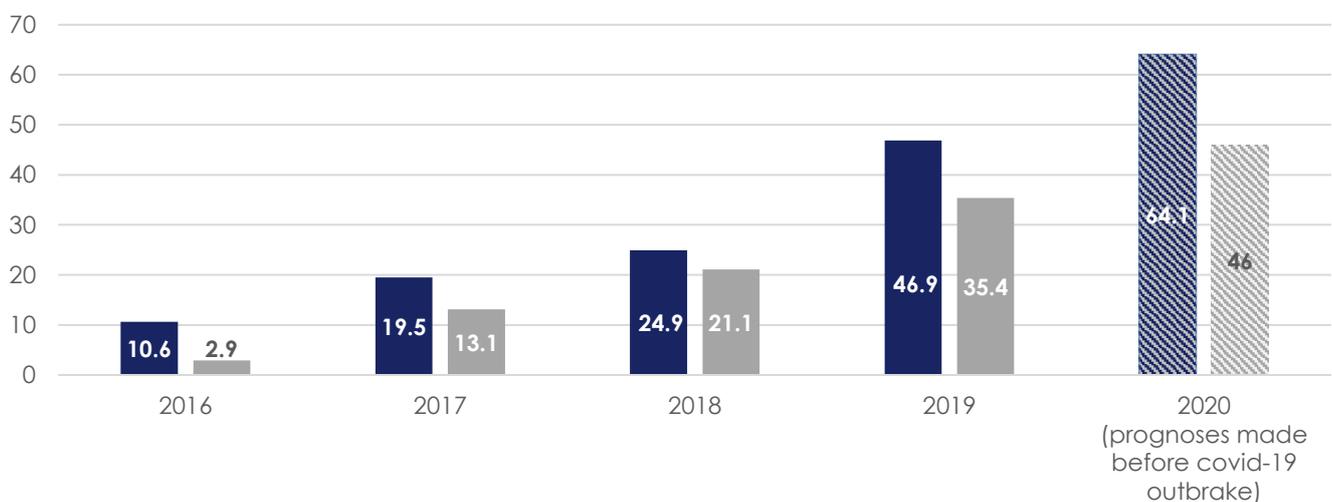
The Ukrainians have already pointed out that the potential U.S. supplies could be delivered through the Polish LNG Terminal in Świnoujście (and/or planned FSRU terminal in Gdańsk), as Ukraine itself does not possess regasification facilities. At the same time there were no signals that any different logistics option was currently being considered.

The Ukrainians tried to build LNG importing terminal in Odessa or Ochakiv for several years, but as for now the project seems to be dead at all.

Even if the rumors had circulated last year about plans to build LNG Terminal in the Ukrainian inland port of Reni, the possible investment could be only about bunkering facilities, but not about "large-scale" FSRU terminal (as media have reported). Moreover, there is also no bright future for any LNG receiving terminals in Ukraine's neighboring country - Romania: especially given Turkey's reluctance to pass LNG carriers into the Black Sea through the Bosphorus strait.

All in all, the regasification terminals in Poland are likely to remain the most feasible option for LNG deliveries to Ukraine for the coming years. Alternative option – usage of Krk LNG Terminal in Croatia, which is currently under construction – seems to be less attractive due to additional transit fees and smaller regasification capacity.

U.S. LIQUEFICATION PRODUCTION AND LNG EXPORTS (mtpa)

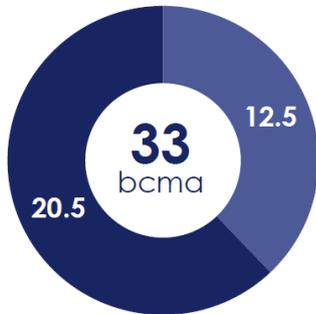


SOURCE: U.S. Energy Information Administration (EIA), International Gas Union

STATE OF THE UKRAINIAN GAS MARKET

Sources of supply to the Ukraine's market

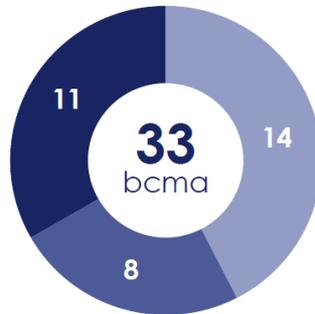
(average since 2016)



- domestic production
- import from the EU

Natural gas use

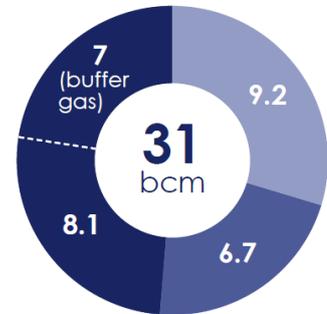
(average since 2016)



- commercial customers, mainly industry (liberalized market)
- households (planned market liberalization)
- others (no liberalization plans)

Ukrainian underground gas storage facilities

(Ownership of natural gas at the beginning of the 2019/2020 heating season, approx.)



- state owned companies
- private traders
- free volumes

The Russian aggression on Crimea and Donbass made Ukraine stop its over 20-year long gas imports from Russia in November, 2015. That was possible, as the occupation of the above-mentioned territories and the economic crisis caused by the Russian aggression both reduced the Ukrainian demand for gas by more than 40 per cent to 30-34 bcma only. As a result, a new, completely different gas supply scheme emerged, which, however, does not mean full independence of Ukraine from natural gas produced in Russia, as it is reversely imported from EU.

Currently, Ukraine covers all its gas demand through domestic production (20-21 bcma) and reverse supplies from EU (11-14 bcma).

By the end of 2019, all the natural gas imported into Ukraine from the EU was shipped via physical reverse from the direction of Slovakia (since 2016 average 8.7 bcma), Hungary (average 2.7 bcma) and Poland (average 1.1 bcma). In 2020, the Ukrainians have also started a virtual reverse from the above-mentioned countries and are going to enable supplies from Romania in the upcoming months too.

As said before, natural gas imported from the European suppliers, such as DXT, RWE or PGNiG, is in fact mostly produced in Russia and then sent via Ukraine to EU. Thus, the ultimate independence of Ukraine from the Russian supplies can be reached only by opening of a new source of supply. These might be

transit supplies via Poland with LNG from the USA, or natural gas imports from Norway via Baltic Pipe (to be commissioned in October, 2022).

At the same time, the key feature of the Ukrainian gas market is one of the world's largest underground gas storage (UGS) systems, concentrated at the border with EU countries.

There are 12 storages in Ukraine (not including 1 in Russian-occupied Crimea), where 31 bcm of gas can be stored, which corresponds to the year-round demand of the Ukrainian economy and almost 8% of the annual European gas needs.

The reduction of gas transit through Ukraine makes it possible that the UGS could store non-Russian gas as well. Therefore, possible future U.S. LNG volumes could not only reach Ukraine's market, but also be stored in UGS system and be further delivered to the EU during the heating season. That would allow U.S. producers to secure price competitiveness.

The European traders are already storing natural gas imported from EU countries in the UGS. At the beginning of the 2019/20 heating season, even more than 2 bcm of natural gas was stored this way. Depending on market demand, it can be sold either to the European consumers or on domestic market.

U.S. SUPPLIES TO UKRAINE: WHAT ARE THE CONSTRAINTS?

The plans for U.S. LNG deliveries to Ukraine seem to get concrete, however few constraints remain at place. Namely they are:

- ⚙ lack of free regasification capacities in Poland at the moment;
- ⚙ dependence on the pace of work regarding planned FSRU terminal in Gdańsk;
- ⚙ problems on agreeing the project of new Ukraine-Poland gas interconnector.

As for now, the Polish LNG Terminal in Świnoujście' nominal regasification capacity is 5 bcma of natural gas, 100% of which is booked by the state's PGNiG.

The capacity of the Polish LNG Terminal will be expanded up till 7,5 bcma by the end of 2021, but it will not bring much opportunity for the LNG deliveries to Ukraine. It seems very likely that the new capacities will all be taken by the PGNiG, as it was previously.

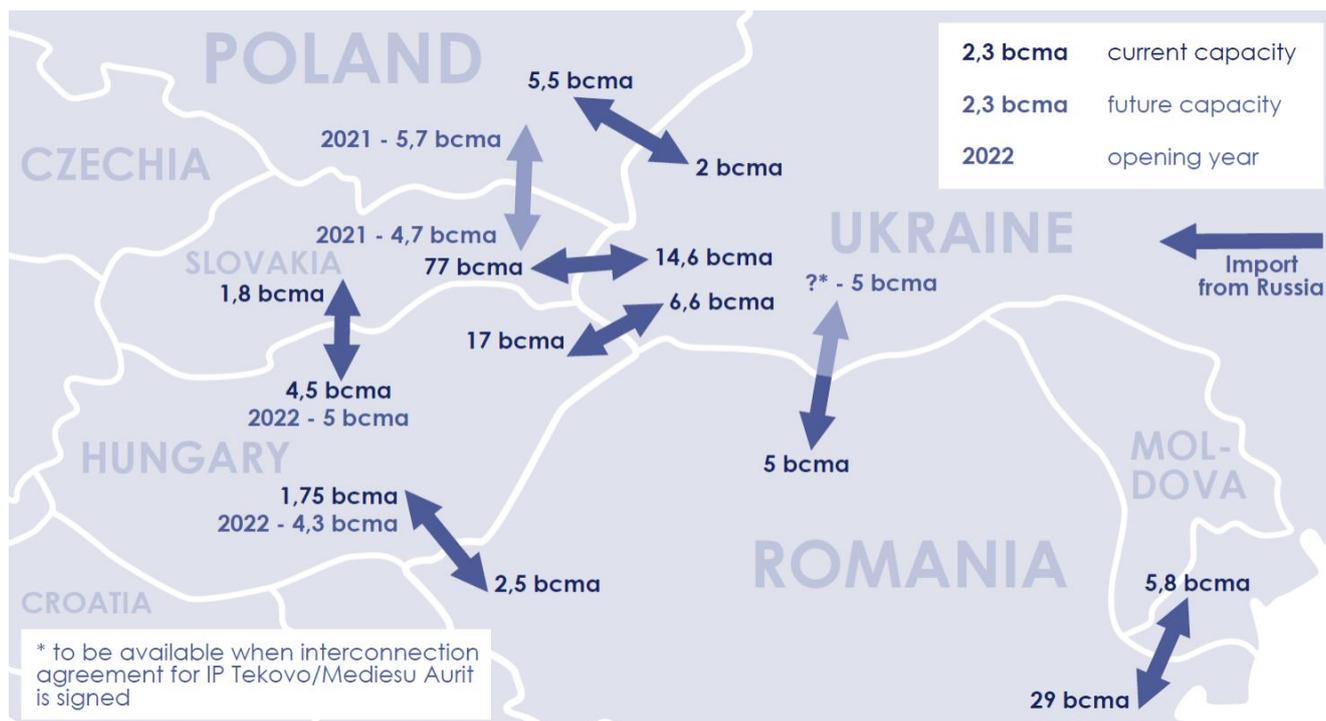
The Polish strategy assumes that the Russian gas supplies shall be replaced by the imports from the alternative sources via Baltic Pipe (Norwegian Continental Shelf) and expanded LNG Terminal. Taking into account that Poland's gas consumption is steadily grow-

ing, the capacity in Świnoujście will have to cover the demand. Therefore, the long-term, significant gas supplies for Ukraine may take place not sooner than 2025, when the Gdańsk FSRU is scheduled to bring online up to 8,2 bcma of regasification capacity.

Another problem is that the physical flow capacity of the existing Poland-Ukraine gas pipeline (Drozdowicz entry/exit point) is limited in direction of Ukraine, amounting to 2 bcma only. The extension to 6,6 bcma is possible but it would require additional investment from the Polish side. And while the Ukrainians lobby the upgrade of the existing pipeline, the Poles push for another option - the new interconnector. But this would require much more work to be done (and money to be spent) by Ukraine than Poland, which ultimately keeps the project frozen.

Alternatively, another solution might be the new gas pipeline connecting Poland and Slovakia, which is expected to be commissioned by the end of 2021 and will enable the physical flow of 4,7 bcma of natural gas in direction of Slovakia. Then the volumes will be sent via already existing interconnector to Ukraine. Such an option could affect the economic viability of the project, as the Slovakia's TSO – Eustream – would also charge the transit fees. Nevertheless, the project should still be feasible.

NATURAL GAS INTERCONNECTORS IN THE REGION



MAIN CONCLUSIONS

Infrastructure remains a constraint

Without the upgrade of pipelines and import terminals in the region neither Ukrainian energy independence nor U.S. LNG export to Ukraine will develop. It must be noted that construction of the new infrastructure may be significantly facilitated by the external financial assistance, especially now, when the COVID-19 induced recession is about to hit the countries. The possible source of help in that regard might be the EU but also the U.S., which could act e.g. through The Three Seas Initiative Investment Fund or the United States Agency for International Development (USAID). Worth to underline that the USAID is already cooperating with TSO of Ukraine LLC (the partnership is to last until June 30, 2023) and is one of the parties which has established the Partnership for the Development of Natural Gas Networks in Eastern Europe (EE-NGP).

The triologue in triangle UA-US-PL (decision-makers, traders, suppliers, TSOs, buyers) should be intensified. Moreover, ultimately it could be also extended to include Romanian partners as well, as they might be cooperating on regional gas hub creation.

Indirect supplies from PGNiG: an option for now

Considering the non-sufficient regasification capacity in Poland and transmission capacity on the Polish-Ukrainian border, it is unlikely that any significant gas supplies will occur in the nearest future. Despite that, the possible option ready as for now might be indirect supplies from PGNiG, which has expanded its LNG portfolio in the last years, adding few contracts with U.S. suppliers. Therefore, the Polish major might be keen to deliver some of the already contracted volumes to the Ukraine, if that will not affect the Poland's domestic gas market. It may be possible in the coming years, as the post-pandemic crisis may slow down the gas demand increase in Poland.

Towards the Ukraine-Romania-Poland natural gas hub

The plans for the U.S. LNG deliveries to the Ukraine may represent a significant stimulus for additional gas markets integration in the region. The transmission capacities between Poland and Ukraine could get expanded, and it will ultimately enable connecting Polish, Ukrainian and Romanian markets, creating a new, major gas hub for the CEE region. It will mean additional possibilities for the traders and, eventually, the benefit for the above-mentioned countries' economies.

To fasten the integration of the PL, UA and RO markets, the interconnected natural gas exchange electronic trading system shall be established, facilitating trading activities and usage of storage capacities for the European needs. That is also a potential area of cooperation with U.S. companies.

Chance for Ukrainian gas market liberalization?

Opening of a new source of supply could also contribute to further "Europeanization" of the Ukrainian gas market. Started in 2015, the liberalization process of gas market in the country, now allows independent companies to supply natural gas to the Ukrainian enterprises that consume around 11 bcma of gas (+/- 33% of the Ukraine's gas needs). This way, both natural gas produced in Ukraine by private gas companies (approx. 4 bcma) and the volumes imported by non-state traders (approx. 7 bcma) are used.

Currently, there are over 650 companies trading natural gas on the wholesale market, including many large international traders., but the market for natural gas supply for household needs (8 bcma) is still waiting for liberalization. And the possible stimulus to push further changes regarding Ukraine's market might be U.S. LNG supplies with all related activities (including additional gas integration with Poland).

