



# Ukraine Oil & Gas

## Industry Guide 2021

Embracing investment opportunities



online version

# OUR STRATEGIC GOAL IS UKRAINE'S ENERGY INDEPENDENCE



Ukraine supports global trends of achieving climate neutrality. Our country is a signatory to the Paris Agreement; we consistently implement the objectives of the European Green Deal, develop renewable energy and are interested in attracting innovative technologies.

Ukraine has significant reserves of natural gas - one of the largest among European countries. We have sufficient resources to fully cover the domestic needs with our own supply.

The policy of the Ministry of Energy is aimed at creating proper environment for the state-owned enterprises, as well as for development of business. We are confident in the investment attractiveness of Ukraine's oil and gas industry. We are interested in exchanging best practices in the field of oil and gas production, attracting the latest technologies and international investments for the development of the industry.

Ukraine's energy independence is not a local issue of security of only one state, but a guarantee of energy security of European countries. And I am confident that, through joint efforts, we will be able to achieve the development of energy systems in Europe that is secure, sustainable and independent of political trends.

**German Galushchenko**  
Minister of Energy of Ukraine

# UKRAINE

## IS A COUNTRY OF UNDERVALUED AND UNDISCOVERED HYDROCARBON POTENTIAL THAT COULD MAKE IT ONE OF THE LEADING EUROPEAN SUPPLIERS OF ENERGY RESOURCES FOR THE YEARS TO COME

The domestic oil and gas producing industry possesses huge prospects for investments and an increase in oil and gas production. The strategic goal of the Ukrainian government is to ensure that domestic gas production meets intrastate gas demands by 2030, which is outlined in the National economic strategy. Fulfillment of this ambitious target requires \$25-30 bln of investment, well beyond the country's internal means.

In the present industry survey, we intend to introduce you to Ukraine; provide you with the background of gas producing industry, which dates back to the middle of XIX century; thoroughly analyse the legal framework in the sector; answer key questions which are of concern for the investors, and, of course, outline the opportunities for investment in oil and gas projects onshore and in the Black Sea.

### THE PRESENT SURVEY WAS ELABORATED BY:



Association  
of Gas Producers  
of Ukraine

**Association of Gas Producers of Ukraine** – the largest union of the national and private gas producing companies. Its main goal is to strengthen energy security, increase domestic gas production and boost the industry development.

The team of the Association have consolidated crucial information about the industry and its reformation.



law·tax·future

**CMS Cameron McKenna Nabarro Olswang** – an international law firm providing a full scope of legal services on all aspects of doing business in Ukraine. CMS energy and projects lawyers are recognised leaders in the sector in Ukraine and the firm holds a leading position in the energy sector receiving top rankings by Chambers Europe (2012–2021), Legal 500 (2015–2021), and Ukrainian Law Firms (2009–2020).

CMS specialists provided their expertise on the legal framework, tax and fiscal policy in the sector.



Ukrainian  
Geological  
Survey

**Ukrainian Geological Survey** – the National Upstream Regulator, ensuring the safe, efficient, and environmentally responsible development of mineral resources providing economic benefits. The Regulator issues exploration and production licenses for all energy resources and minerals, supervising their performance, and carrying out geologic assessments across the country.

The Regulator has provided Guide with a list of investment opportunities.



Ministry  
of Energy  
of Ukraine

**Ministry of Energy of Ukraine** – the central executive body, whose activities are directed and coordinated by the Cabinet of Ministers of Ukraine.

The Ministry ensures the formation and implementation of state policy in the fuel and energy complex of Ukraine. In particular, it is responsible for conducting tenders, approving the winners and ensuring signing of Production Sharing Agreements.



NAFTOGAZ  
GROUP

**Naftogaz Group** – the largest energy group of companies in Ukraine, which carries out a full cycle of exploration and development of fields, drilling, storage of oil and gas, as well as the supply of natural and liquefied gas to consumers.

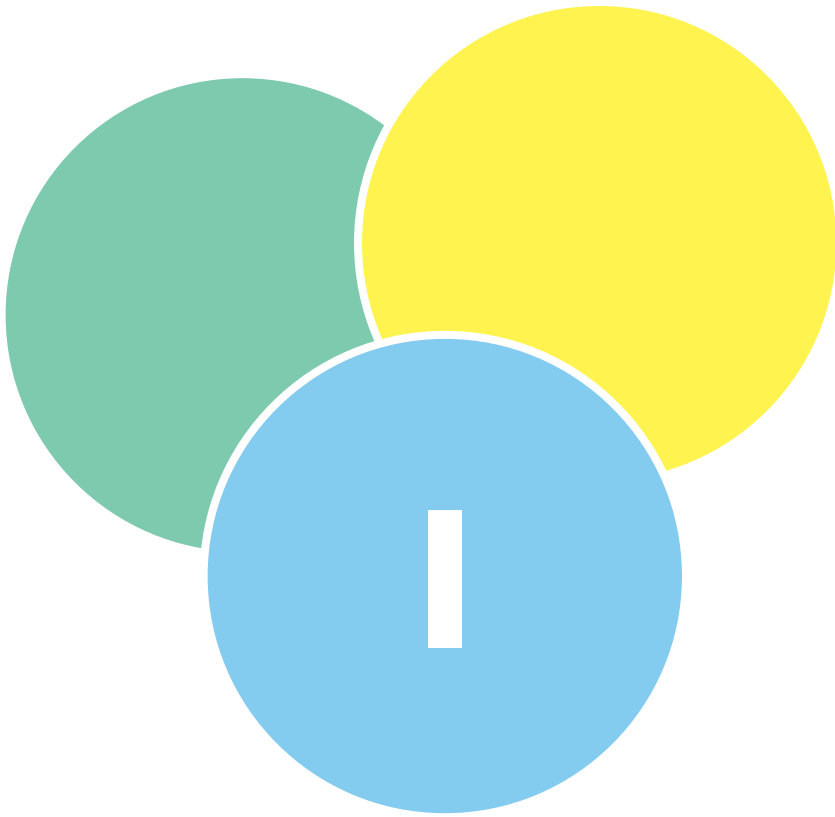
Intending to attract partners to joint projects, Naftogaz Group has provided a list of projects for investment.

## UkraineInvest

Your Investment Matters

**UkraineInvest** – a government investment promotion office established in 2016 to attract foreign direct investment and assist foreign investors in expanding their business in Ukraine. It is a one-stop shop that provides foreign investors with information about investment opportunities and legal advice on doing business in Ukraine, as well as efficient aftercare support for all investors. UkraineInvest also continuously strives to improve the investment climate in Ukraine by elaborating proposals for draft laws and amendments to regulations.

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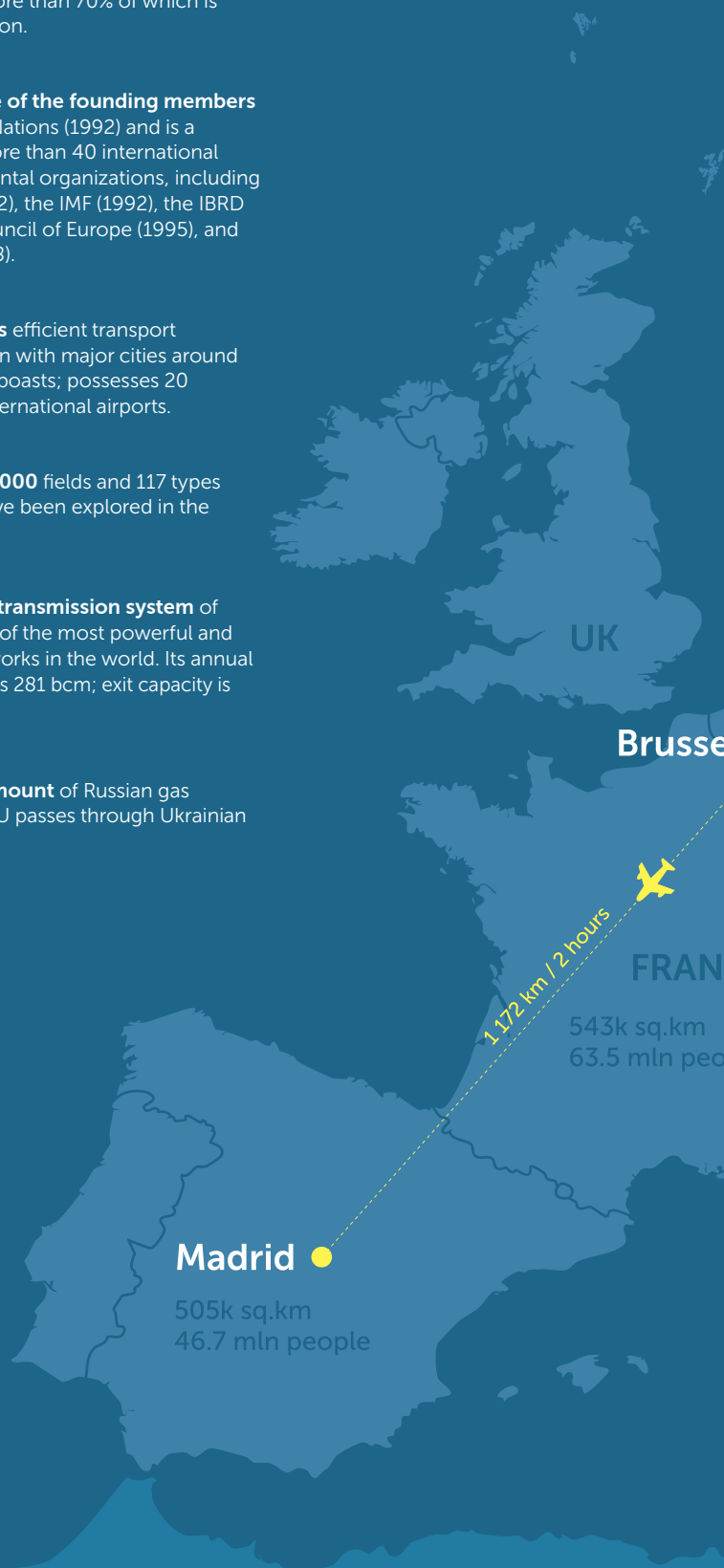


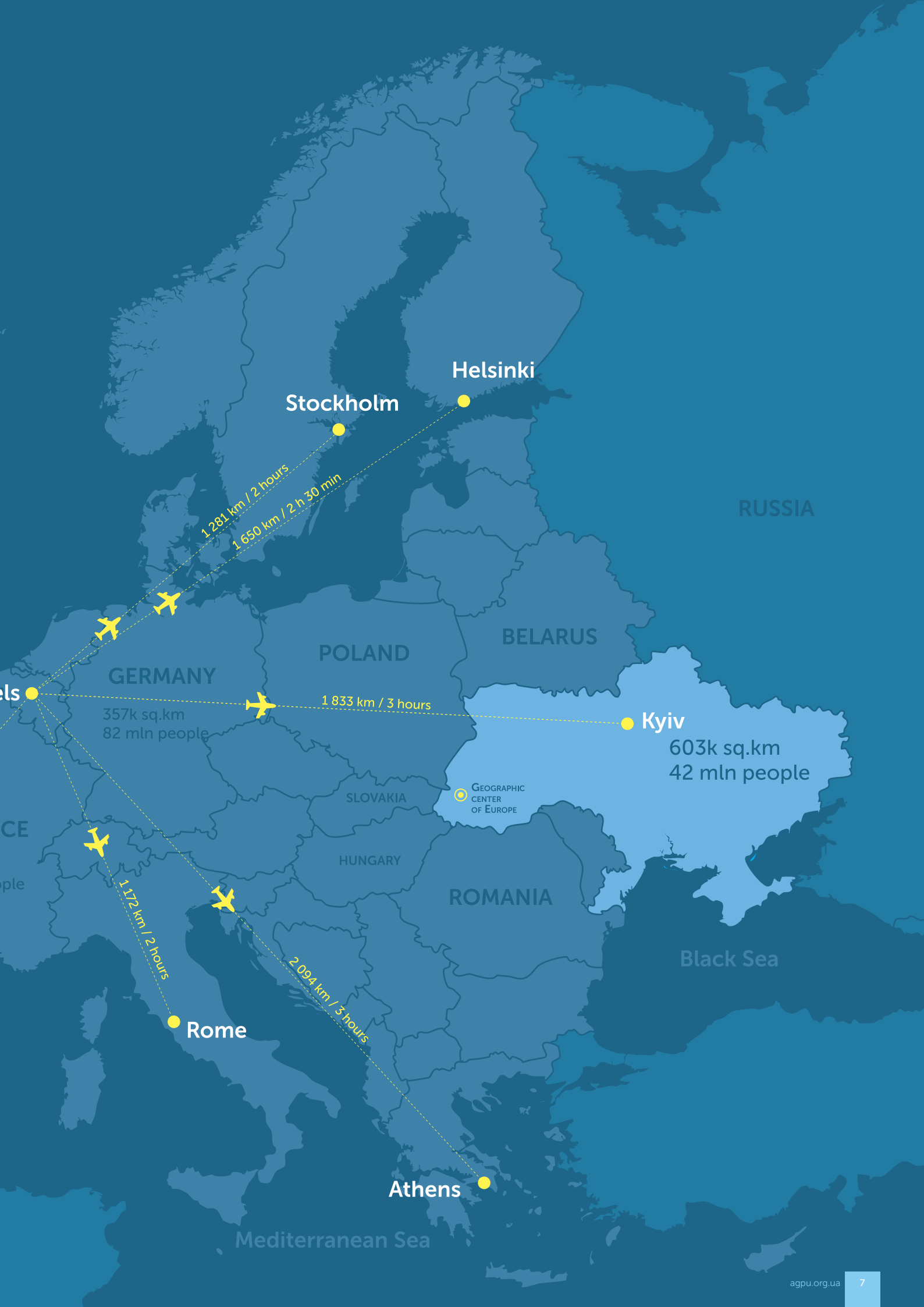
## About Ukraine

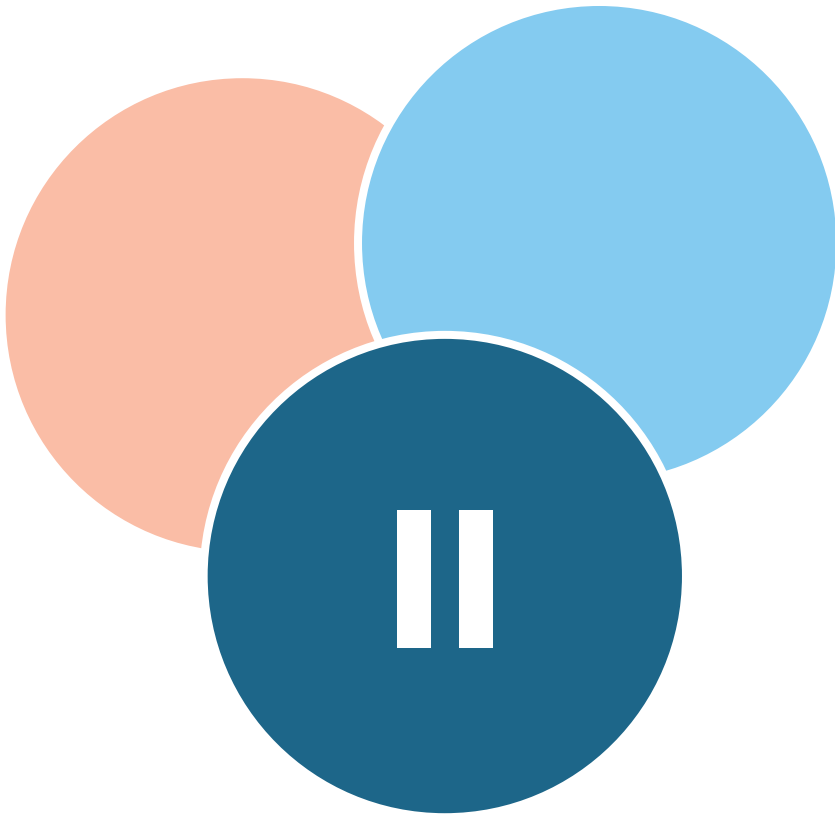


# UKRAINE

- **The largest** country in Europe.
- **Ranked 8th** in Europe in terms of population, more than 70% of which is urban population.
- **Ukraine has an Association Agreement** with the European Union, as well as 16 free trade agreements covering 45 countries, including the EU and Canada.
- **Ukraine is one of the founding members** of the United Nations (1992) and is a member of more than 40 international intergovernmental organizations, including the OSCE (1992), the IMF (1992), the IBRD (1992), the Council of Europe (1995), and the WTO (2008).
- **The capital of Ukraine** - Kyiv and the capital of Greece - Athens are the same distance from the EU headquarters.
- **Ukraine enjoys** efficient transport communication with major cities around the world and boasts; possesses 20 functioning international airports.
- **It borders** both - the Black Sea and the Sea of Azov, and has 13 ports.
- **More than 20 000** fields and 117 types of minerals have been explored in the country.
- **One-quarter of global chernozem** (most fertile soils) are concentrated in Ukraine.
- **Ukraine's gas transmission system** of Ukraine is one of the most powerful and extensive networks in the world. Its annual entry capacity is 281 bcm; exit capacity is 146 bcm.
- **Ukraine is one of the eight countries** in the world that can provide a full cycle of engineering and production of aerospace equipment, among the top five countries in the world with a full cycle of tanks production and one of the ten largest shipbuilding countries.
- **The largest amount** of Russian gas transit to the EU passes through Ukrainian territory.
- **Ukraine is the number one in Europe** in terms of the size of the underground storage facilities complex; second in terms of proven natural gas reserves and fourth in terms of its production.







## Oil and gas sector of Ukraine

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## THE OIL & GAS INDUSTRY IS FUNDAMENTAL FOR THE FUNCTIONING OF THE ENTIRE ECONOMY OF UKRAINE

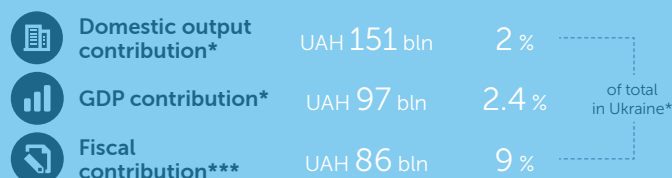
### PERVASIVE BY OPERATING MODEL:

Capital-intensive, which creates high business demand for associated industries

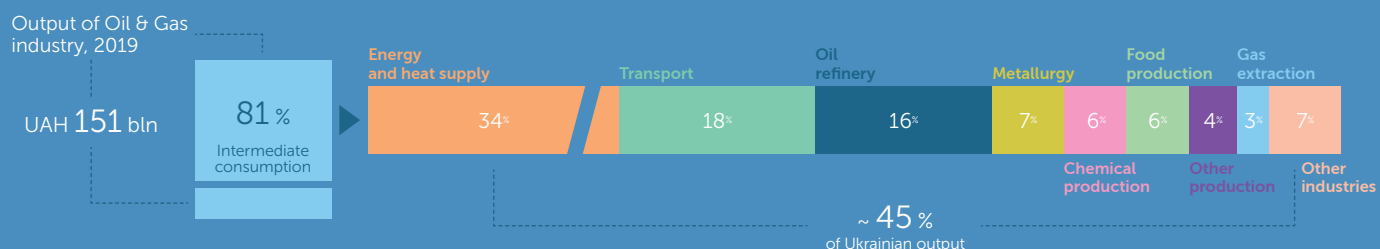
Effective in terms of OPEX use, while diverse in terms of OPEX structure

Not labour intensive, requires high-skilled staff, has high added value per employee

The oil & gas industry's monetary contribution to the Ukrainian economy is above its weight in terms of the industry's inputs



**OVERWHELMING BY PRODUCT USE:** Around 80 percent of the oil & gas extraction industry's output is consumed by other industries, which collectively make up half of Ukrainian output (as at 2019)



Note: the average exchange rate in 2019 according to NBU was 25.85 USD/UAH.  
Source: \*SSSU; \*\*Naftogaz; Association of Gas Producers of Ukraine; \*\*\*Project 'Rating. Business in numbers'.

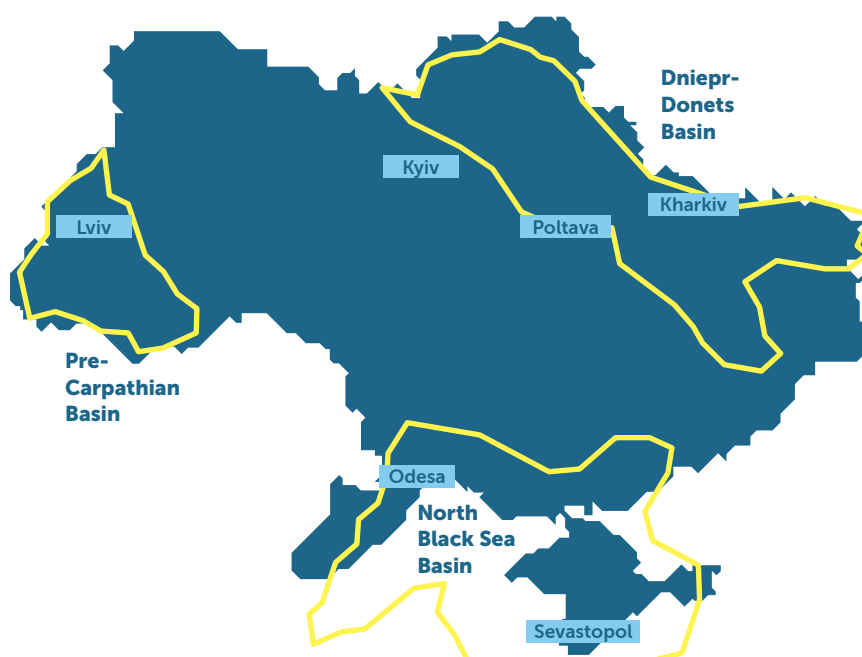
Fossil fuels of all kinds can be found in Ukraine, including: oil, natural gas, condensate, coal, peat and oil shale. There are four oil and gas bearing provinces and nine oil and gas bearing regions in the country. Their geographical location allows grouping them into three oil and gas regions: East, West and South.

As of 1 January, 2020, there were almost 500 gas fields and blocks in Ukraine. The most promising areas for the discovery of new fields and hydrocarbon deposits are located in the South of Ukraine are the Black and Azov Seas waters, and in the East

and West are deposits at great depths in the Dnepr-Donets and Precarpathian oil and gas regions.

The key reserves are concentrated in the Eastern region of Ukraine, where 90% of all natural gas is produced and almost 80% of the total discovered reserves are located. At the same time, to explore new deposits, it is crucial to carry out additional exploration, including throughout exploration and commercial development prepare for industrial production.

### AN OVERVIEW MAP OF THE LOCATION OF OIL AND GAS FIELDS IN UKRAINE



Source: AGPU.

## HISTORY OF THE DOMESTIC GAS INDUSTRY

Oil and gas production in Ukraine began in the middle of the nineteenth century at the Boryslav oil and gas field in the West of the country. Initially, there was no purposeful search for gas fields, they were discovered during the drilling of wells for water, salt or oil in the immediate vicinity of consumers. New wells were drilled without prior exploration, calculation of reserves as gas consumption increased or to maintain the level of gas production when the flow rates in existing wells fell. This period of the gas industry is commonly characterised as a period of artisanal development methods.

In the early 1990s, gas production in Ukraine began to decrease significantly to 18-18.5 bcm per year, but since the early 2000s, remained at 20-21 bcm per year. This period can be characterised as the stagnation of the industry and the focus on the purchase of Russian imported natural gas. At the same time, active investment in the sector by independent gas producers began. This was primarily due to favourable prices and the liberalization of the industry.

XIX century



1970s

The discovery and commissioning new fields into operation in the mid - 1970s led to an increase in production in the main oil and gas basins, which allowed an increase in gas production to a record 69 bcm per year.

1990s

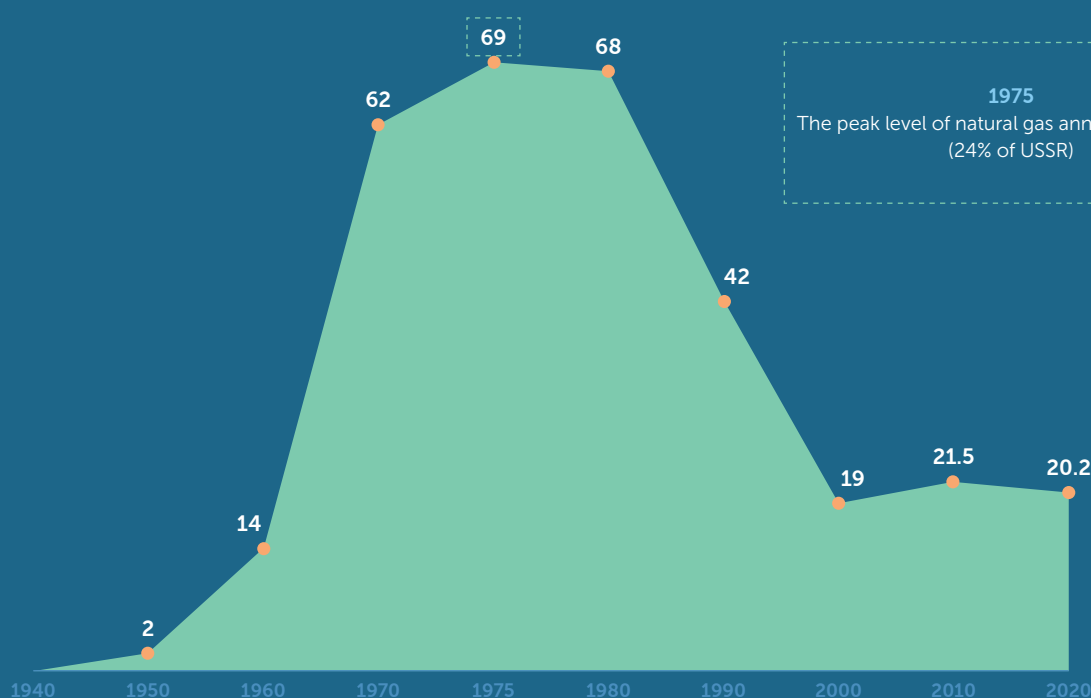


2010s



It is worth noting that Ukraine has repeatedly tried to attract international investors in hydrocarbon production through tenders for the conclusion of production sharing agreements (PSAs). We refer, in particular, to such well-known oil and gas producing companies as Shell, Chevron, ExxonMobil, Eni. However, due to various objective circumstances, these agreements were not fulfilled.

## NATURAL GAS PRODUCTION IN UKRAINE IN 1940-2020, BCM



As a result of Russia's annexation of Crimea and the war in the East, Ukraine lost much of its assets. In particular, the state-owned company Chornomornaftogaz, a member of the Naftogaz Group, that produced almost 8% of the country's annual gas production, was seized by Russian Armed Forces.

The years 2019-2020 were extremely difficult for the gas industry both in Ukraine and the rest of the world. The COVID-19 pandemic, the global economic crisis and the record drop in hydrocarbon prices came as a real shock to the sector. In Ukraine, the situation was complicated by the expectation of the so-called 'gas war' with Russia's Gazprom due to the expiration of the transit contract and, as a result, the oversaturation of underground gas storages in Ukraine as well as in Europe.

2014

2016

In 2016, the Government set a strategic goal - to increase Ukrainian gas production and completely abandon imported supplies. To this end, the Concept for the Development of the Ukrainian Gas Production Industry to 2020 was adopted, the key task of which was to increase gas production in the country to 27.6 bcm. However, due to several objective factors, it was not possible to fully implement the Concept and significantly increase gas production. It is worth saying that during this period several important reforms were carried out in the sector, including the implementation of incentive taxation for drilling of the new gas wells and the sale of special subsoil use licenses at transparent online auctions. This was the basis for the recovery of the industry and of the quantitative increase in private enterprises in the sector.

2019-2020

2021

In March 2021, the Government approved the National Economic Strategy 2030, where one of the key tasks is to increase gas production to cover 100% of Ukraine's gas requirements. To achieve the strategic goal, national gas producing companies have developed and are implementing their own strategies to increase natural gas production.

2021

Ukraine still plays important role in European gas market:

Ensures	2/3 demand of consumption domestically
Operates	Secured and signed gas transmission contract up to 2024 year
Possesses	Largest onshore drill rig fleet with 30 active drilling rigs in average
Provides	Underground gas storages with capacity, of more than 30 bcm
Holds	Almost 900 bcm of prospective natural gas resources

Source: Naftogaz Group, AGPU.

## RESERVES AND RESOURCES

Ukraine is the European leader in the reserves to production ratio (R / P), second after Norway in proven natural gas reserves and fourth in terms of gas production.

Reserves in Ukraine can be categorised as follows: developed and undeveloped booked reserves; contingent resources; non-appraised and conditionally booked reserves.

According to the State balance of mineral reserves of Ukraine, the discovered proven reserves of natural gas (free and dissolved + basin centre gas) are 778.2 bcm, contingent resources - 10.1 bcm, with uncertain commercial value - almost 370 bcm and conditionally booked reserves - 0.074 bcm.

Ninety-four percent of the developed and undeveloped booked reserves are located on the territory of 443 deposits onshore, with the remaining 6% - in 15 deposits on the continental shelf.

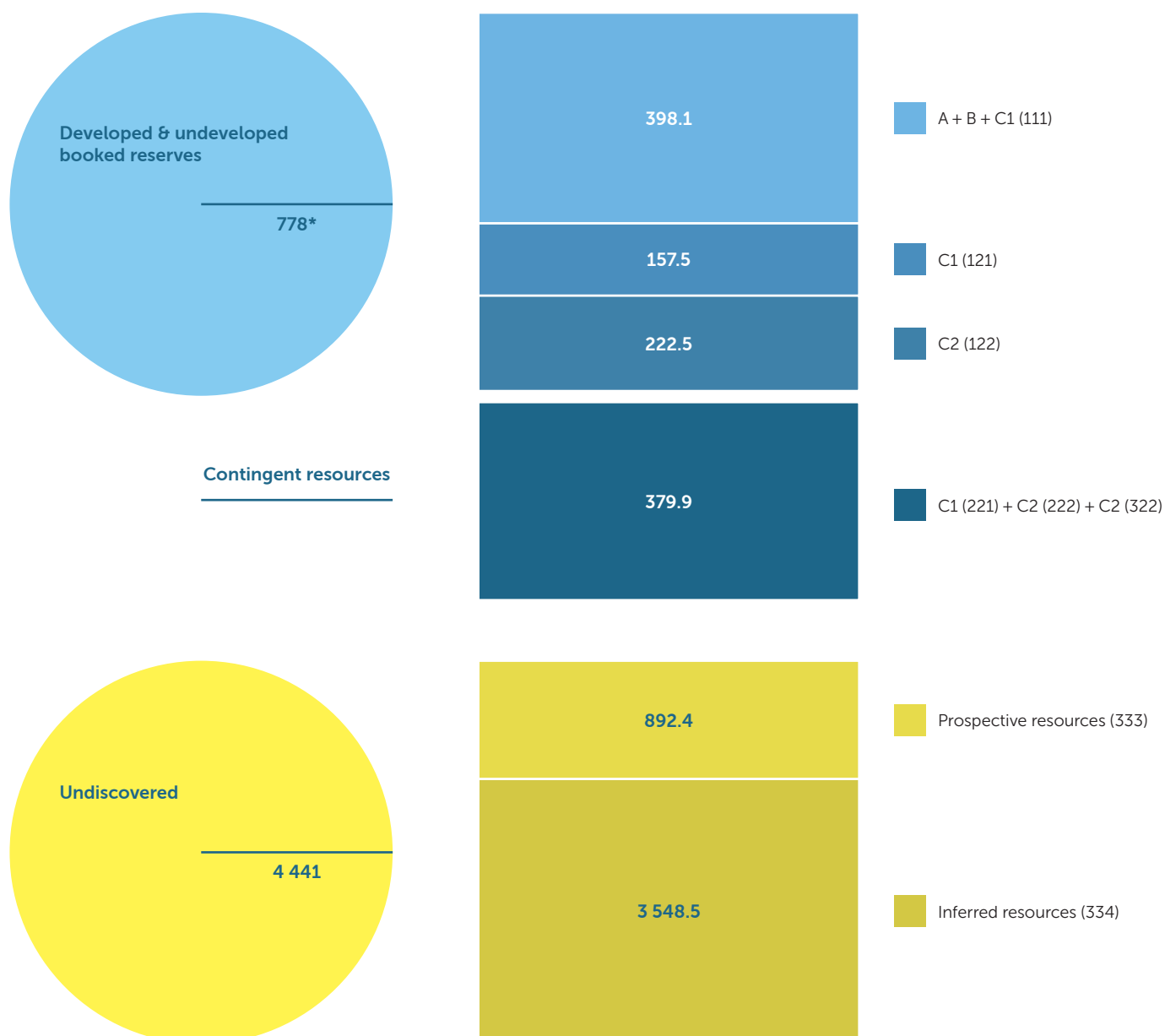
The main reserves of natural gas are concentrated in the East region of Ukraine. This region possesses 283 gas fields (blocks), which amount to 606 bcm of discovered booked reserves (77.92% of its category in Ukraine). In turn, the 132 gas fields in the West region amount to 105 bcm (13.53%). The 43 gas fields in the Southern region amount to 66.6 bcm (8.55%).

Ukraine has its own definitions of reserves for official purposes which approximately could be estimated as A+B+C1 (111) – Proved (1P); C1 (121) – Probable (2P), C2 (122) – Possible (3P).

For the purposes of this report, industry data will be reflected according to official data.

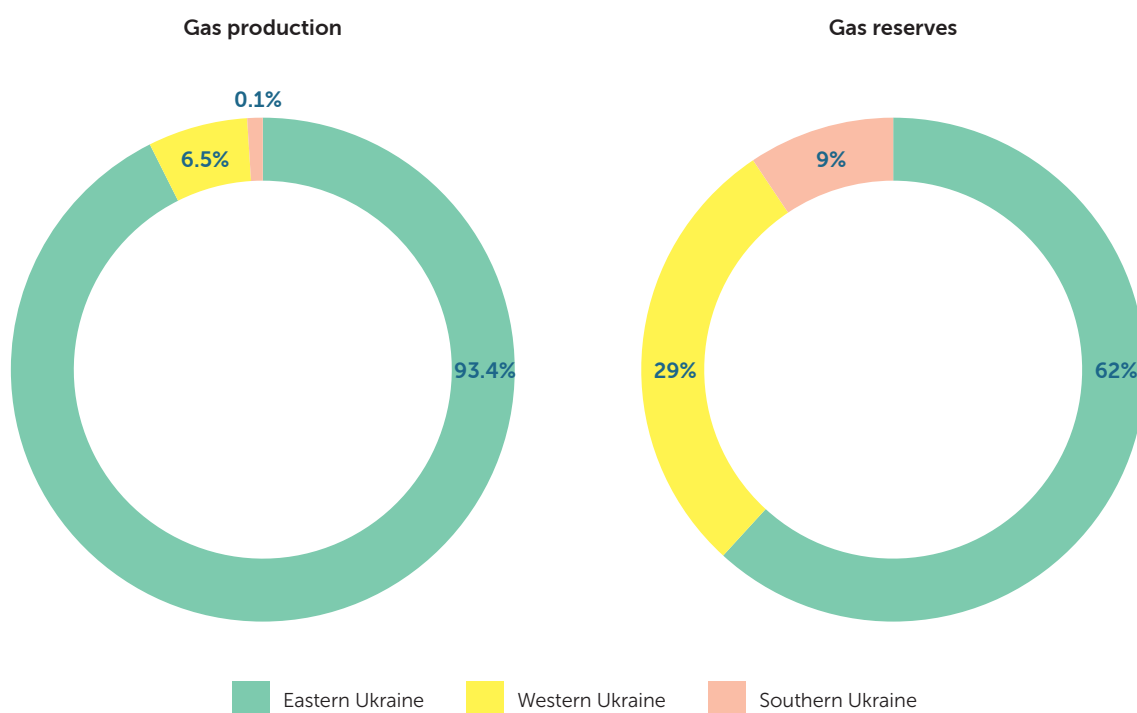
Additionally, O&G companies voluntarily disclose the information according to SPE-PRMS standards.

### INFORMATION ON GAS RESERVES AND RESOURCES IN UKRAINE, BCM

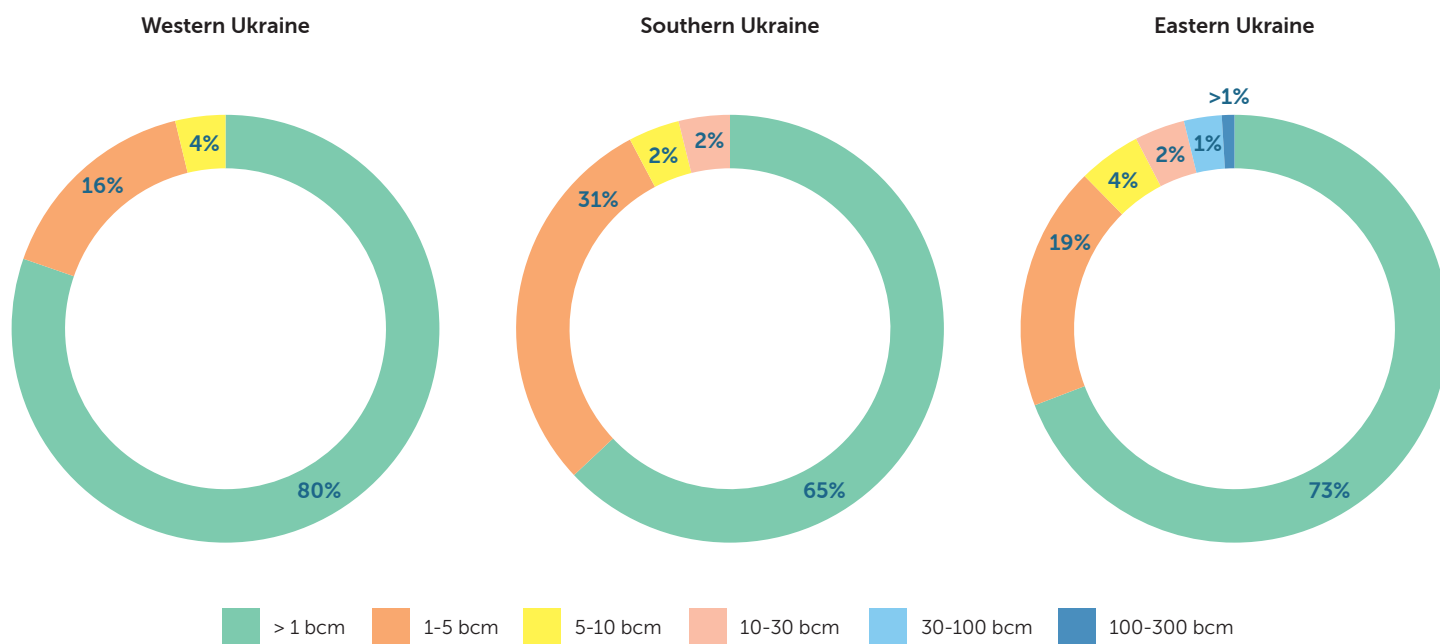


Note: \*including basin centre gas of the Svyatogirsk field.  
Source: State balance of mineral reserves of Ukraine as of 1 January 2020.

## DISTRIBUTION OF GAS RESERVES AND PRODUCTION ACROSS UKRAINE

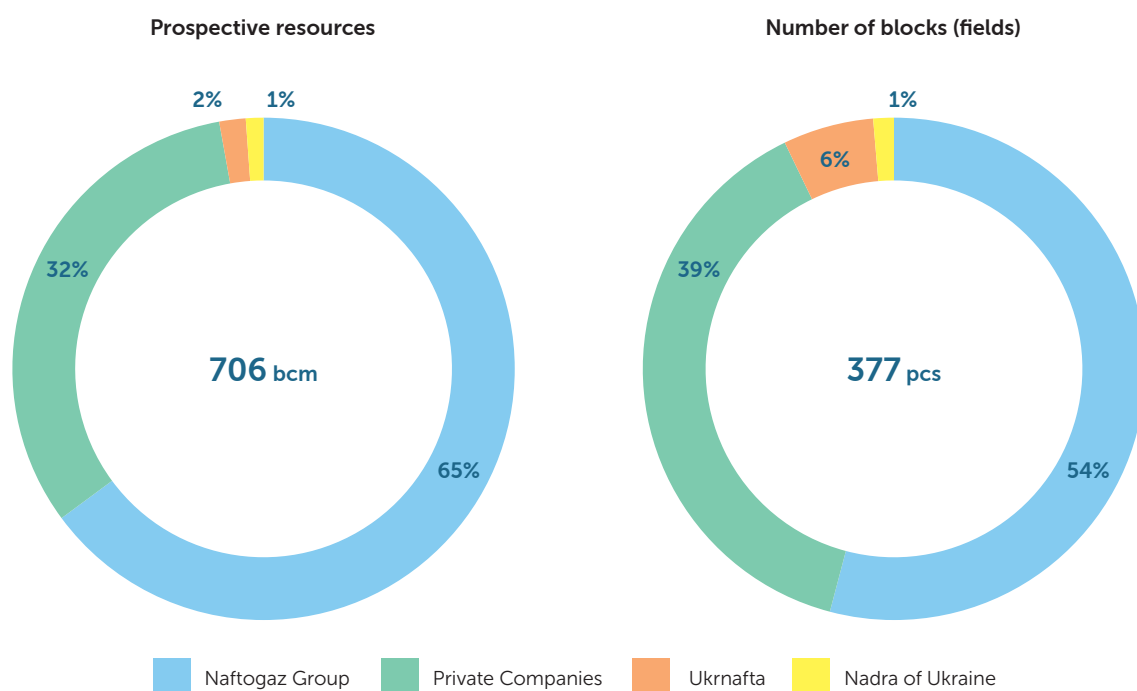


## DISTRIBUTION OF GAS FIELDS BY VOLUMES OF GAS RESERVES ACROSS UKRAINE



Source: State balance of mineral reserves of Ukraine as of 1 January 2020.

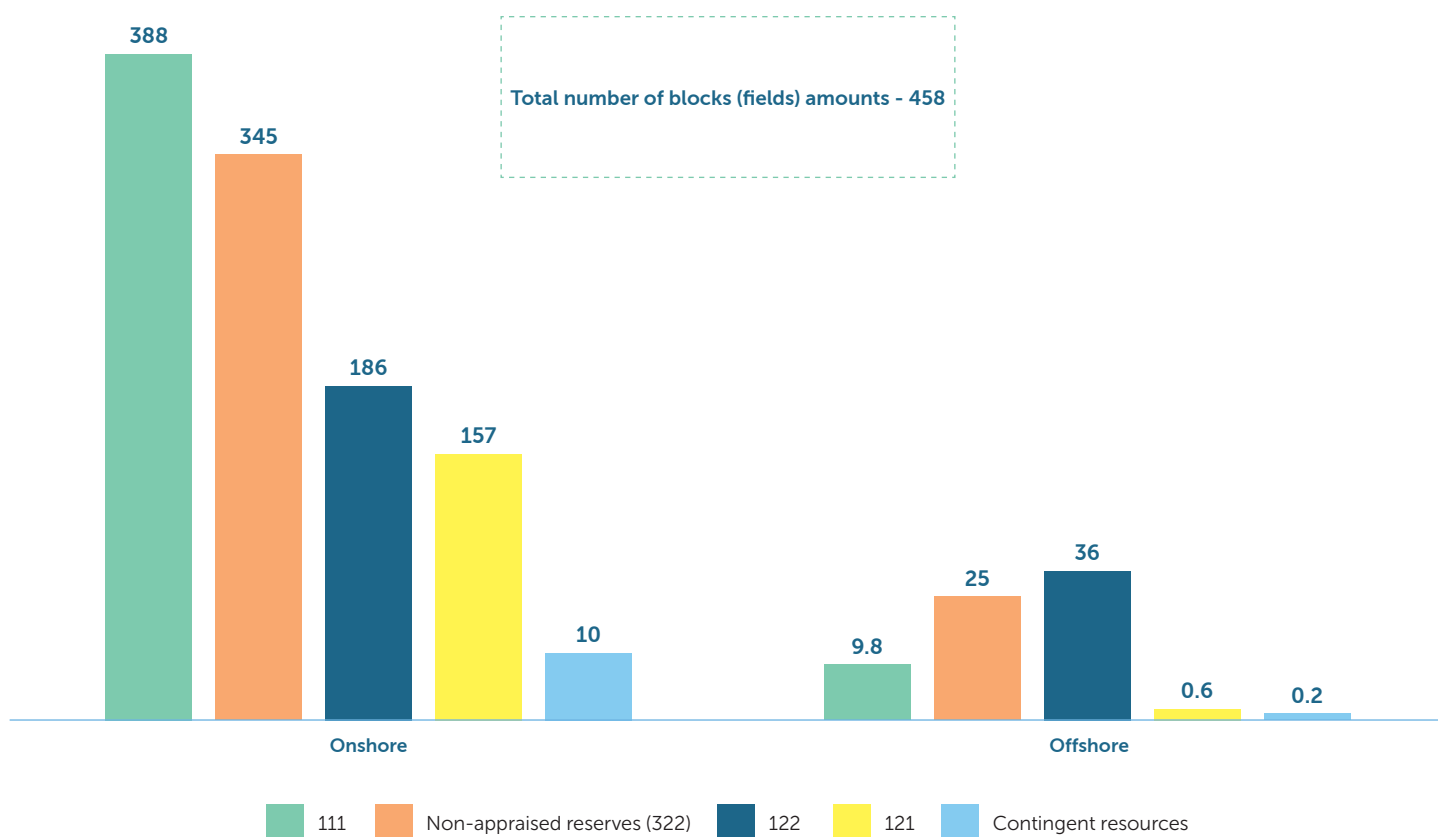
## NATURAL GAS PROSPECTIVE RESOURCES AND NUMBER OF FIELDS BY GROUPS OF ENTERPRISES



Source: State balance of mineral reserves of Ukraine as of 1 January 2020.

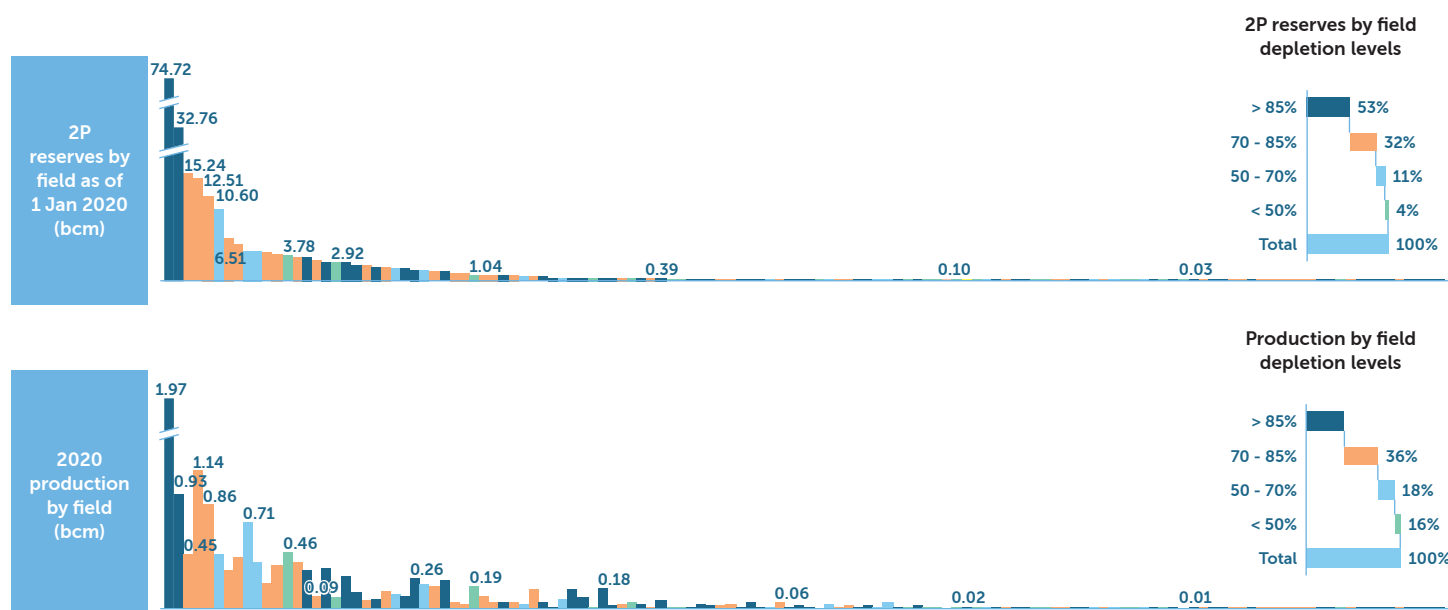
Currently, 285 of 458 natural gas fields are under commercial development with booked reserves of 679 bcm (87.32% of all reserves of this category in Ukraine). Among the developed gas fields, 279 are located onshore and 6 on the continental shelf.

## NATURAL GAS RESERVES BY CATEGORIES, BCM



Note: Including 18 licenses of Chornomornaftogaz and occupied fields on continental shelf and Crimea.  
Source: State balance of mineral reserves of Ukraine as of 1 January 2020.

The factor of natural decline and depletion of fields significantly hinder the development of national gas production. Thus, JSC Ukrgasvydobuvannya, which is part of the Naftogaz Group, has the five largest gas fields at its disposal, which are almost 80% depleted. However, the practice of efficient exploitation of brownfields, exploration, and successful use of intensification methods and involvement of international partners somewhat constrain the decline.



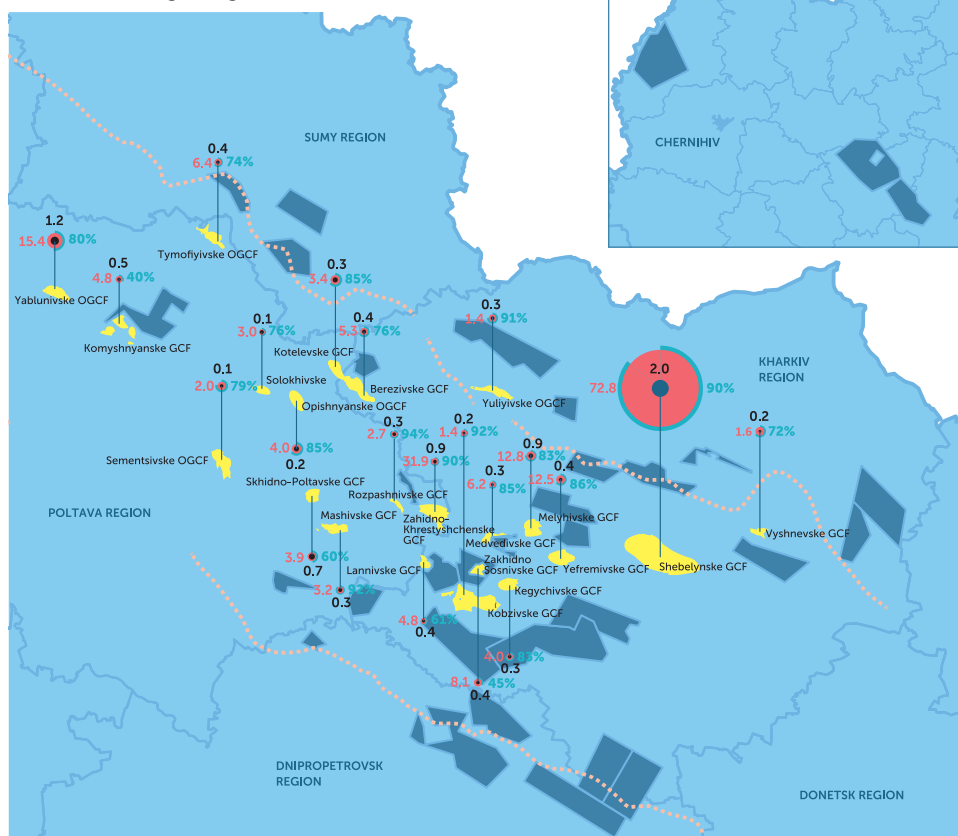
Note: 1) The existing brownfields portfolio is highly-depleted: over 70% accounts for 85% of 2P reserves and 76% of 2020 production.  
 2) Based on 130 fields with non-zero 2P reserves as of 1 Jan 2020; does not include Sviatogirsk field with 1mcm of 2P reserves as of 1 January 2020.  
 Source: Naftogaz Group, DeGolyer & MacNaughton.

### JSC UKRGASVYDOBUVANNA FIELDS THAT ACCOUNT FOR MORE THAN 2/3 OF TOTAL PRODUCTION

#### Western oil and gas region



#### Eastern oil and gas region



Source: Naftogaz Group.

Ukraine has significant potential for the development of deposits of unconventional hydrocarbons, in particular, tight gas. Its drained reserves are estimated at 1.2 tcm, but they are not currently being developed. Thus, according to the State balance of mineral reserves of Ukraine, tight gas reserves only in the East region of Ukraine amount to about 100 bcm, with almost half of these reserves drained at a depth exceeding 5 000 m.

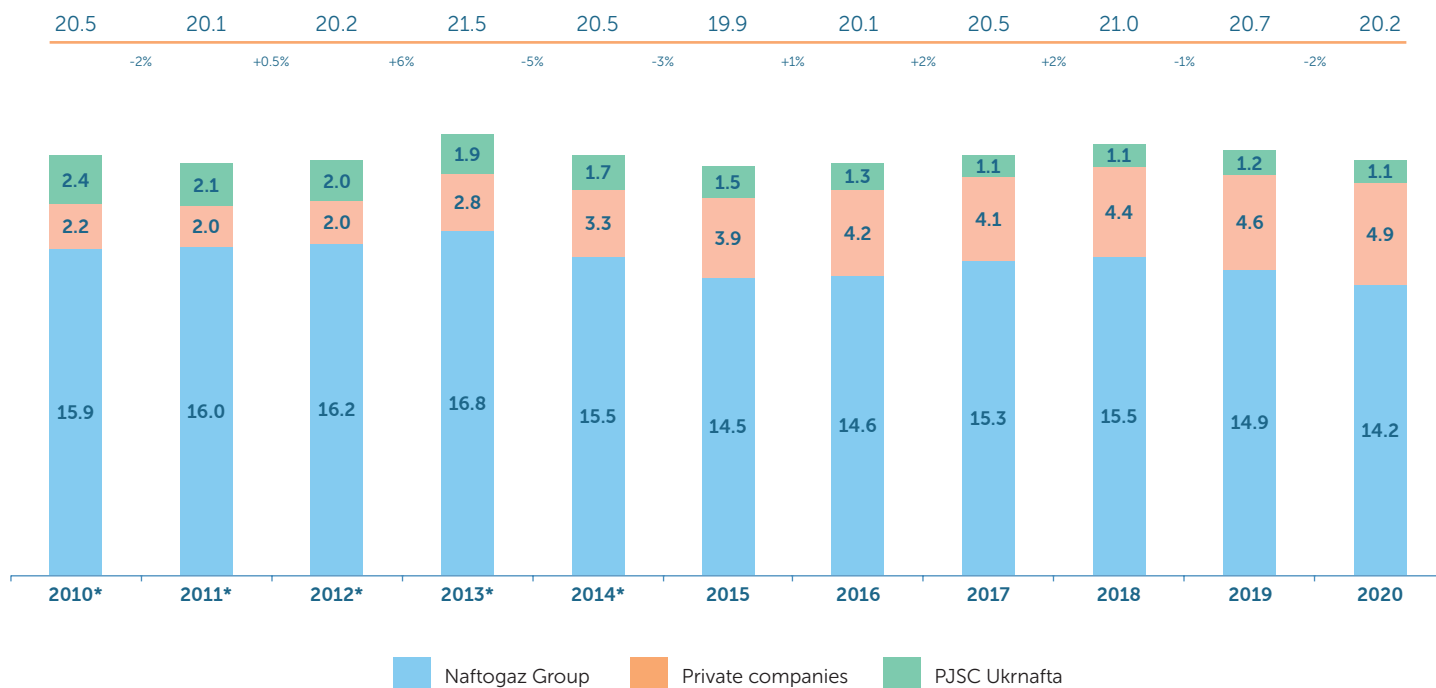
## NATURAL GAS PRODUCTION

Over the last 10 years, annual natural gas production has averaged 20 bcm, which is not enough to cover intrastate gas consumption demands.

The annexation of part of Ukraine led to the loss of the state-owned company Chornomornaftogaz, which provided almost 8% of total production in Ukraine.

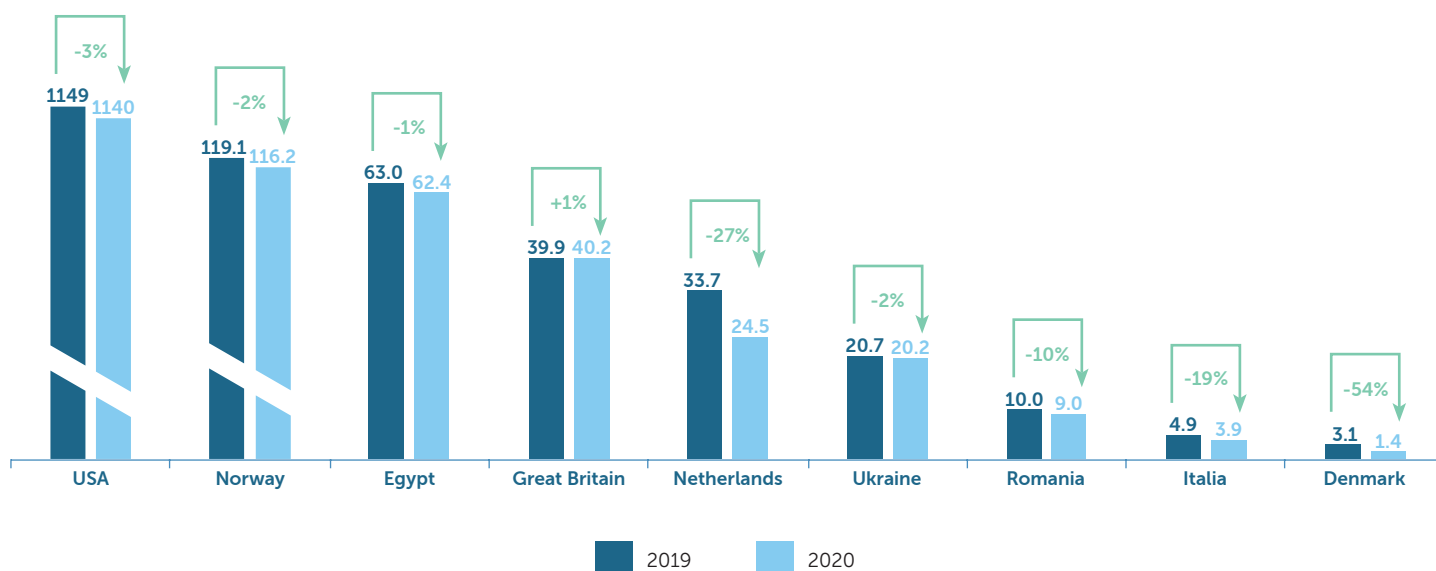
Nevertheless, independent gas producers are steadily increasing their share in total production from year to year due to capital investments in the sector. Such results are the benefit of free pricing and the implementation of incentive taxation.

### GAS PRODUCTION IN UKRAINE DURING 2010-2020, BCM



Note: \*including gas production of PJSC Chornomornaftogaz (Naftogaz Group).  
Source: GTS of Ukraine data, Naftogaz Group.

### CHANGE IN NATURAL GAS PRODUCTION IN 2019-2020, BCM



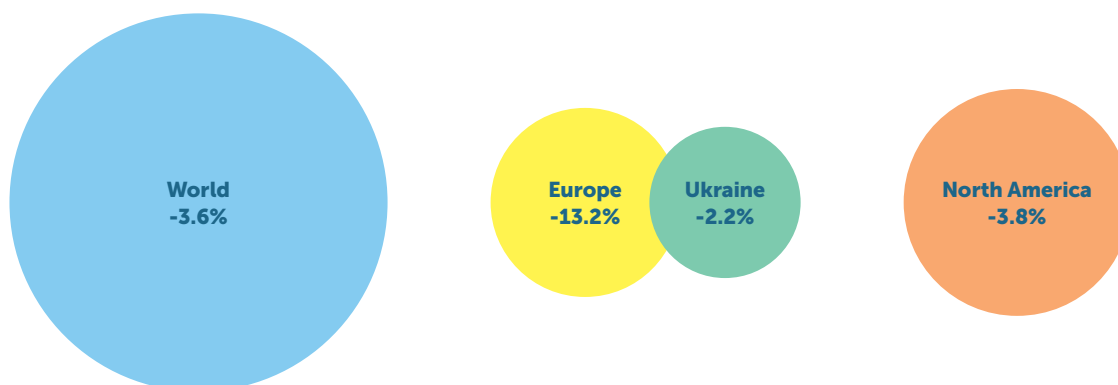
Source: AGPU, Naftogaz Group.



In 2020, global natural gas production decreased by 144 bcm (-3.6%), to 3.845 bcm as low oil and gas prices led to lower exploration and production.<sup>5</sup> With production estimated to have dropped by 47 bcm to 1.103 bcm in 2020, North America was the gas-producing region most impacted by the COVID-19 pandemic. It should be noted that before that, global gas production was growing exceptionally. 2020 marked the first year in a long time when even the fast-growing Asian region could not resist the global pandemic and the era of low prices in the natural gas market.

EU natural gas production continued its downward trend, falling by 13% in 2020 compared with 2019, to total 96.2 bcm. Norway produced 116.2 bcm, which is also lower by 2.8 bcm (-2%) than the previous year. The largest decline in natural gas production in 2020 was observed in the Netherlands, where production decreased by 9.2 bcm (-27%).

#### THE RATE OF DECLINE IN NATURAL GAS PRODUCTION IN 2020



Source: Naftogaz Group.



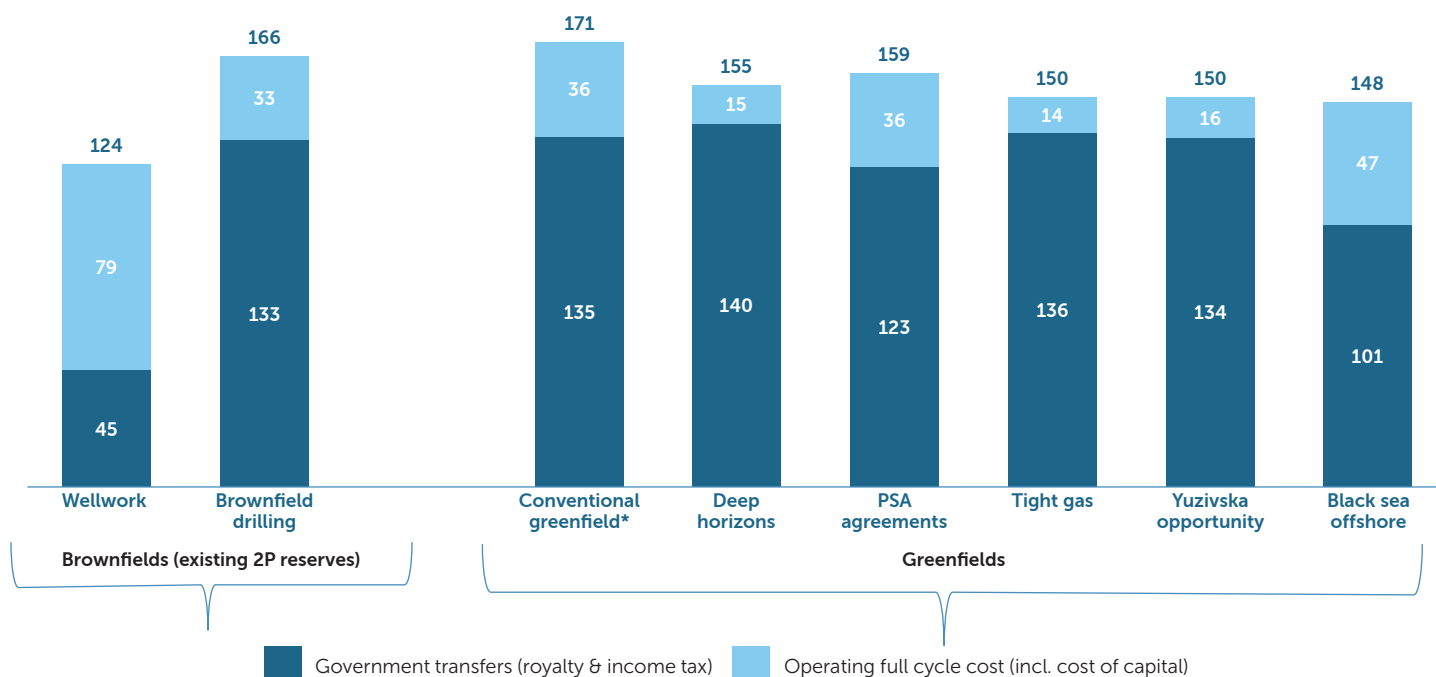
## TOTAL NUMBER OF ISSUED LICENSES IN UKRAINE INCLUDING ACREAGE, RESERVES AND PRODUCTION IN THE RESULT OF 2020

	Number of licenses	Acreage, sq.km	Natural gas reserves, bcm	Gas production, bcm
UGV (Naftogaz Group)	206	19 260	502.6	14.230
Ukrnafta (Naftogaz Group)	82	1 742	189.4	1.125
Naftogaz of Ukraine	39	29 825	0.2	0
Diloretio Group	30	3 955	2.0	0.769
Geo Alliance Group	15	3 629	2.7	0.203
Nadra of Ukraine	10	2 574	0.2	0.004
Zasyadko Mine	9	1 908	0	0
Zakhidnadraserwis	7	1 774	0	0.204
DTEK Oil&Gas	6	1 152	13.4	1.845
PPC (JKX O&G)	6	404	1.5	0.239
KUB-GAS	6	824	0.6	0.104
Cub Energy	6	708	0	0.034
Plast	5	695	1.5	0.018
Smart Energy Holding	5	451	0.5	0.401
Mizhrehionalna gas company	5	1 221	0	0
Goryzonty Group (MND)	4	160	0.2	0.004
Arab Energy Alliance UA	2	181	0.6	0.011
Nadra Geoinvest	2	93	0.3	0.102
UNB	1	34	6.1	0.725
Energy 95	1	61	0.9	0.050
Cadogan Petroleum	1	12	0	0.001
Nadra Oleska PSA (Nadra of Ukraine)	1	7 886	0	0
Nadra Yuzivska PSA (Naftogaz Group)	1	6 324	0	0
Others	92	9 861	19.3	0.161
<b>Total</b>	<b>542</b>	<b>94 734</b>	<b>741.9</b>	<b>20.230</b>

Note: 1) Excluding 18 licenses of Chornomornaftogaz and occupied fields on the continental shelf and Crimea;  
 2) Including assigned 7 PSAs; 3) Including 36 offshore licenses of Naftogaz of Ukraine; 4) As of 1 July 2021.  
 Source: Geoinform of Ukraine, initial gas reserves GIIP.

An analysis of the costs of gas production in the gas fields (blocks) throughout the exploitation cycle shows that the most expensive are new fields with conventional hydrocarbon reserves, as they require additional funds for geological work and have an average level of taxation compared to the other types of projects.

#### FULL CYCLE COST IN THE CASE OF PROJECT SUCCESS, \$ PER THOUSAND CM

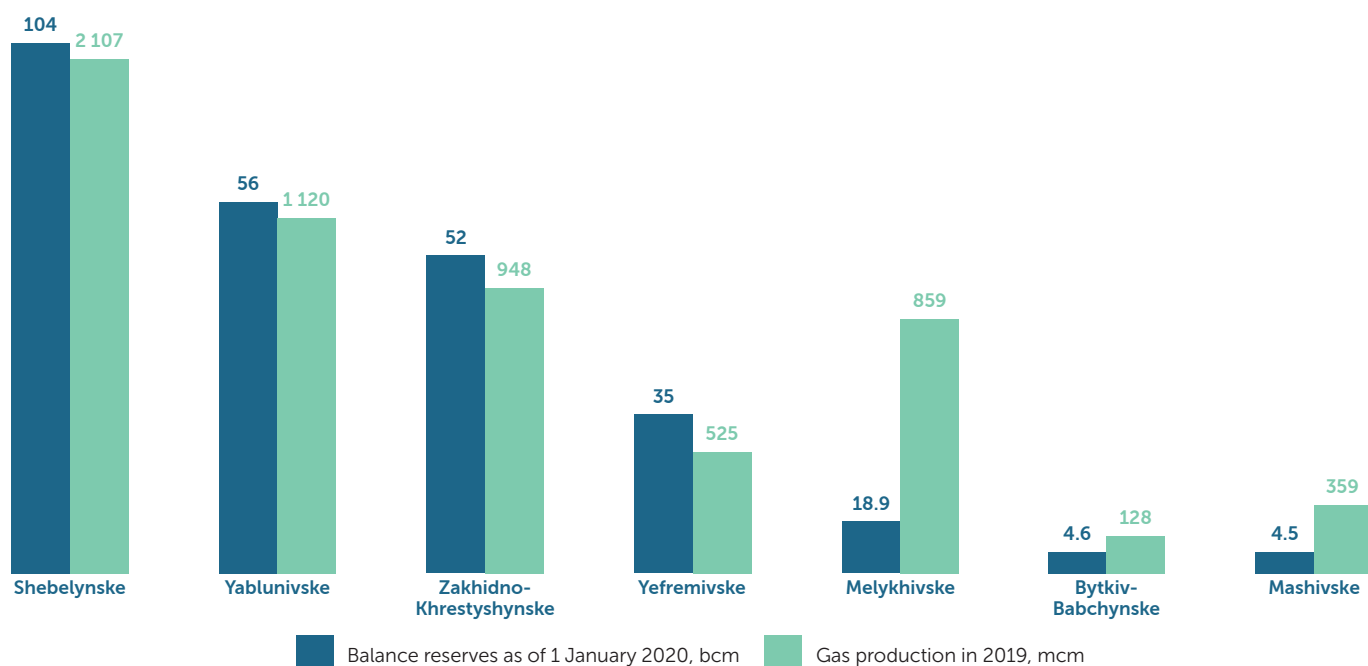


Note: \*in case EMV positive permits.  
Source: Naftogaz Group.

#### Ukrainian gas fields are divided into:

- mega-fields- Shebelynske (13.4% of reserves in Ukraine and 10.2% of annual production),
  - large - Efremivske, Zakhidno-Khrestyshenske and Yablunivske (18.5% of reserves in Ukraine and 12.5% of annual production),
  - medium - 7 fields (14.3% of reserves in Ukraine and 11.4% of annual production),
  - small - 18 fields (15.9% of reserves in Ukraine and 24.9% of annual production),
  - very small - 89 fields (28% of reserves in Ukraine and 27.6% of annual production),
  - tiny - 340 blocks (9.9% of reserves in Ukraine and 13.5% of annual production).
- A total of 35.4% of all natural gas reserves of Ukraine and 29.2% of total production lie in the 7 largest fields.

#### TOP-7 LARGEST GAS FIELDS IN UKRAINE WITH THE INITIAL BOOKED RESERVES EXCEEDING 30.000 MCM



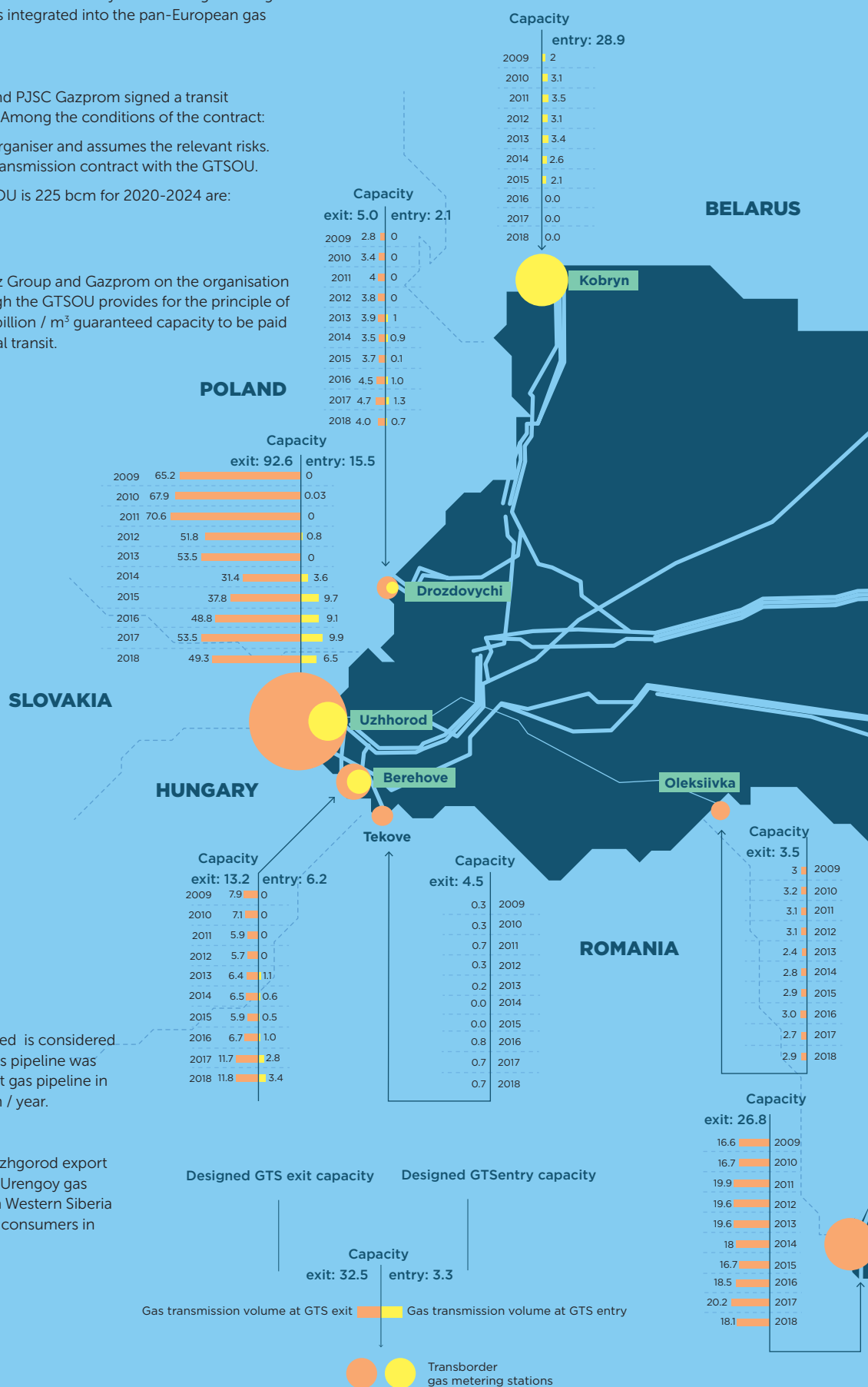
Note: Each gas field is operated by UGV (Naftogaz Group).  
Source: State balance of mineral reserves of Ukraine as of 1 January 2020.

## TRANSMISSION

Ukrainian GTS is one of the largest in Europe in terms of transportation. Its entry capacity is 281 bcm per year, and its exit capacity is 146 bcm per year. Ukraine's gas transportation system is interconnected with the systems of neighbouring European countries through which it is integrated into the pan-European gas network.

At the end of 2019, Naftogaz Group and PJSC Gazprom signed a transit agreement for five years (2020-2024). Among the conditions of the contract:

- Naftogaz Group acts as a transit organiser and assumes the relevant risks. NJSC Naftogaz signs a standard transmission contract with the GTSOU.
- The reserved capacity of the GTSOU is 225 bcm for 2020-2024 are:
- 2020 – 65 bcm / year;
- 2021-2024 – 40 bcm / year.
- The agreement between Naftogaz Group and Gazprom on the organisation of the transit of Russian gas through the GTSOU provides for the principle of ship or pay, which considers 225 billion / m<sup>3</sup> guaranteed capacity to be paid for, even in the absence of physical transit.

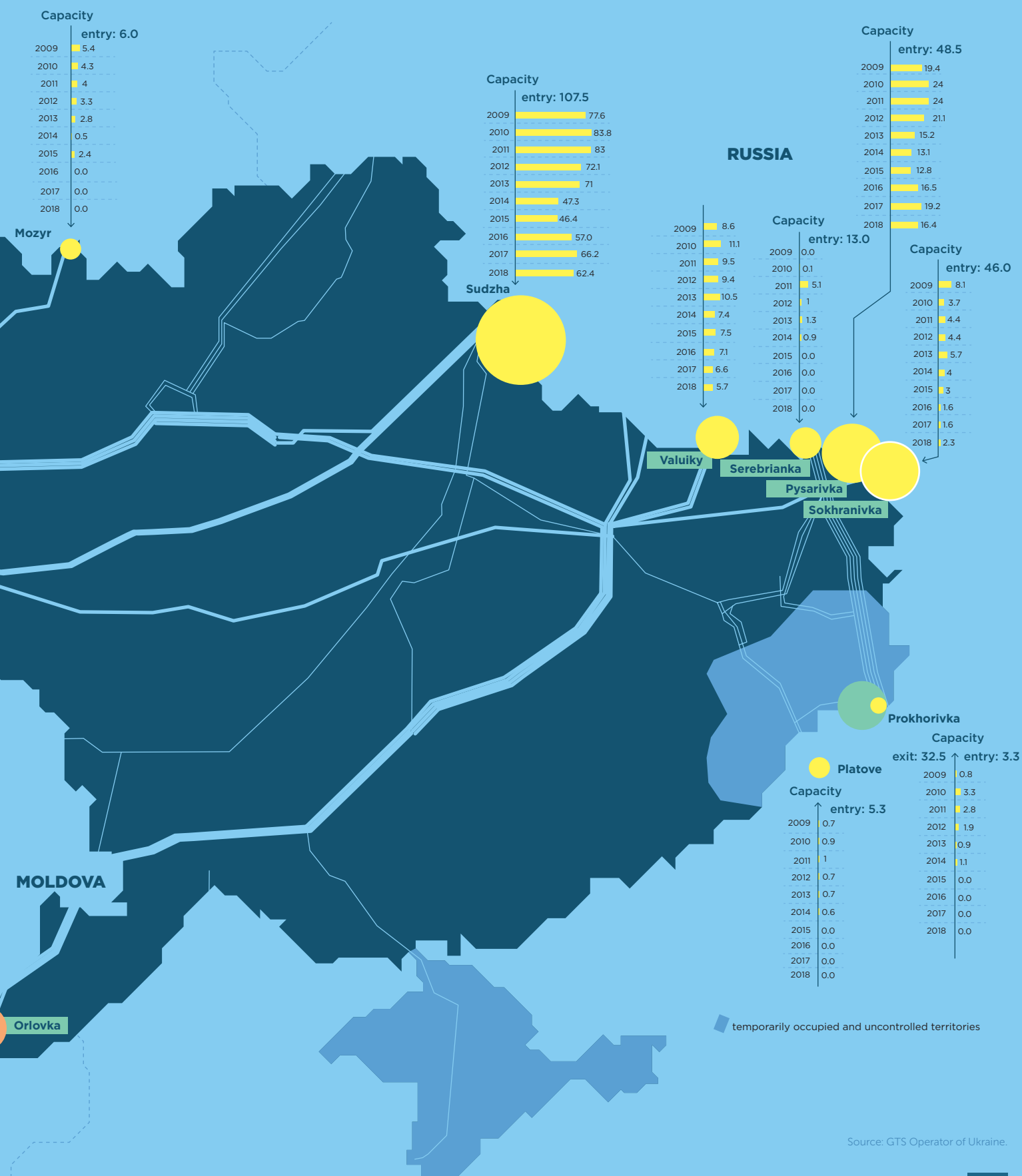


The year the Ukrainian GTS was founded is considered to be 1948, when the Dashava-Kyiv gas pipeline was built, which at that time was the largest gas pipeline in Europe with a capacity of about 2 bcm / year.

In 1982-1984, the Urengoy-Pomary-Uzhgorod export gas pipeline was built, connecting the Urengoy gas field (RF) and the gas fields of northern Western Siberia (RF) with Uzhgorod (Ukraine) and final consumers in Central and Western Europe.

The system of main gas pipelines in Ukraine can be divided as follows:

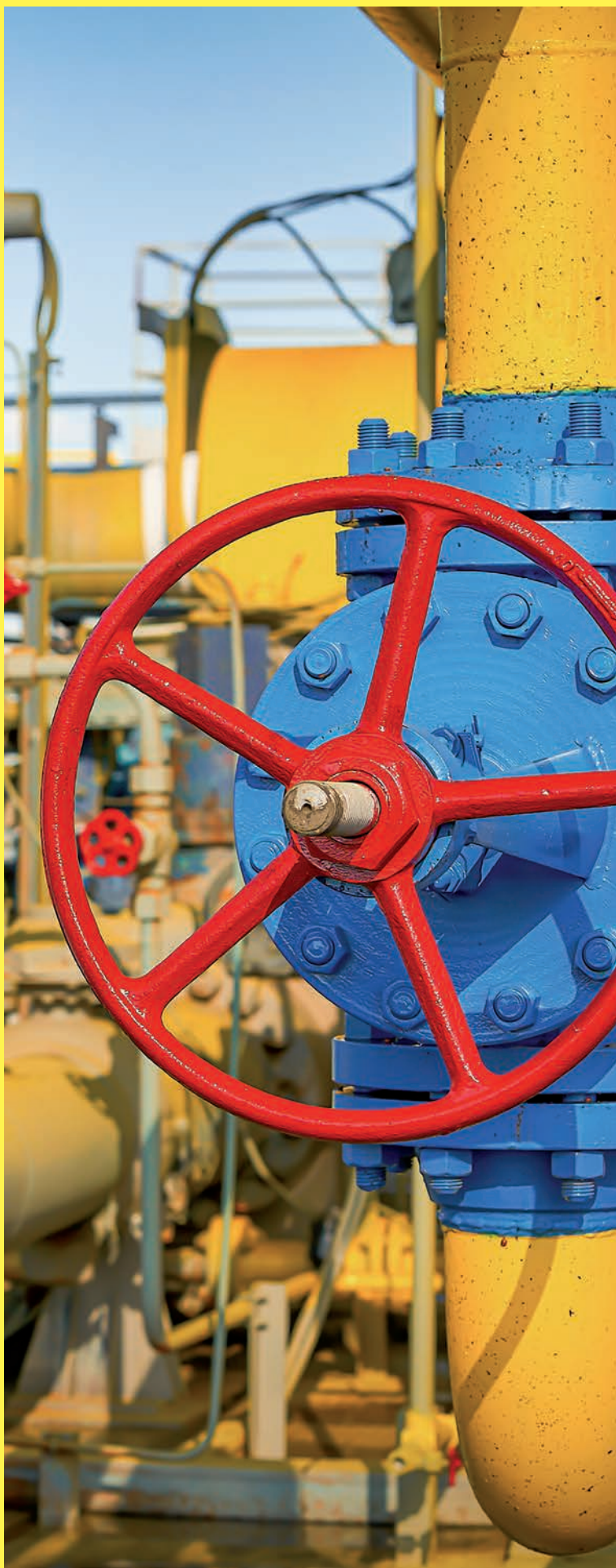
- Western transit corridor (Soyuz, Urengoy-Pomary-Uzhhorod, Progress gas pipelines);
- Southern transit corridor (gas pipelines Yelets - Kremenchuk - Kryvyi Rih Shebelinka - Dykanka - Kryvyi Rih - Izmail, Ananyiv - Tiraspol - Izmail, Kremenchuk - Ananyiv (AB), Rozdilna - Izmail).
- Physical points of interstate connection are established with Slovakia, Moldova, Romania, Russia, Belarus, Poland, and Hungary.



Source: GTS Operator of Ukraine.



## TECHNICAL DATA OF THE UKRAINIAN GAS TRANSMISSION SYSTEM



In accordance with the Association Agreement with the EU, under the Third Energy Package obligations, at the end of 2019, Ukraine successfully implemented one of the key reforms of the gas market - unbundling (separation of natural gas transportation from its production and supply).

From 1 January, 2020, the activity of natural gas transportation was separated and the operation of the main gas pipelines is carried out by an independent GTS Operator of Ukraine.

Ukraine continues to implement measures to reform the gas and electricity markets further, as well as to implement the provisions of the updated Memorandum of Understanding concerning the Strategic Energy Partnership between Ukraine and the European Union together with the European Atomic Energy Community. From 1 March, 2020, in addition to the capacity of the Budince connection point used for natural gas imports to Ukraine since 2014, Eustream and GTSOU under the signed cooperation agreement for the Velke Kapushany-Uzhhorod connection point launched a virtual reverse mechanism (a backhaul), which allows further expand of the Slovak supply corridor to Ukraine.

Ukraine also provides the opportunity to receive a discount on gas transportation between certain interstate entry and exit points, the short-haul. Due to a significant reduction in Russian transit, the GTS Operator has significant underemployed capacity at interstate connection points in Western Ukraine. The short-haul service opened access for customers to the markets of Poland, Hungary, Slovakia, and Romania through the GTS of Ukraine, having the opportunity to book capacity at attractive rates. This product is intended only for transit transportation, without opening access to the Ukrainian VTP and the internal market, but can be used in conjunction with the customs warehouse service of the UGS operator.

The GTS Operator provides stable gas transportation for system users. Also, according to Regulation 312/2014 (EU) and the Code of the gas transmission system, which implements the norms of European legislation, daily gas balancing is operative in Ukraine, and all transportation services customers are obliged to balance their balancing portfolio on time.

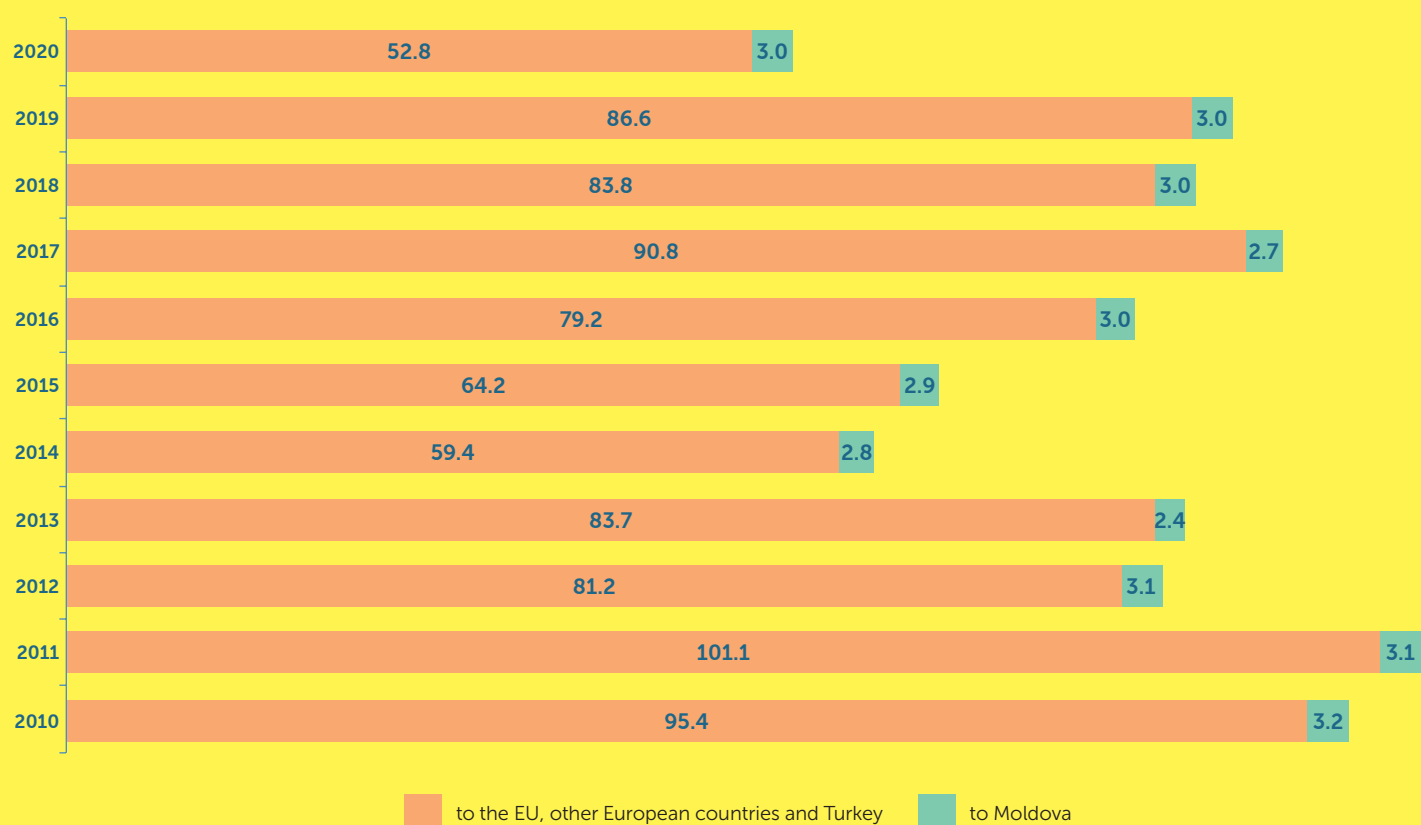
Tariffs for natural gas transportation for entry points and exit points to / from the gas transmission system (s) on interstate connections for the regulatory period 2020 - 2024 for GTSOU are as follows:

- for entry points: from \$4.45 to 16.01 per 1 000 cm per day net of VAT;
- for exit points: from \$0.56 to 9.71 per 1 000 cm per day net of VAT.

Tariffs for natural gas transportation services for internal entry points and exit points to/from the gas transmission system(s) for the regulatory period 2020 - 2024:

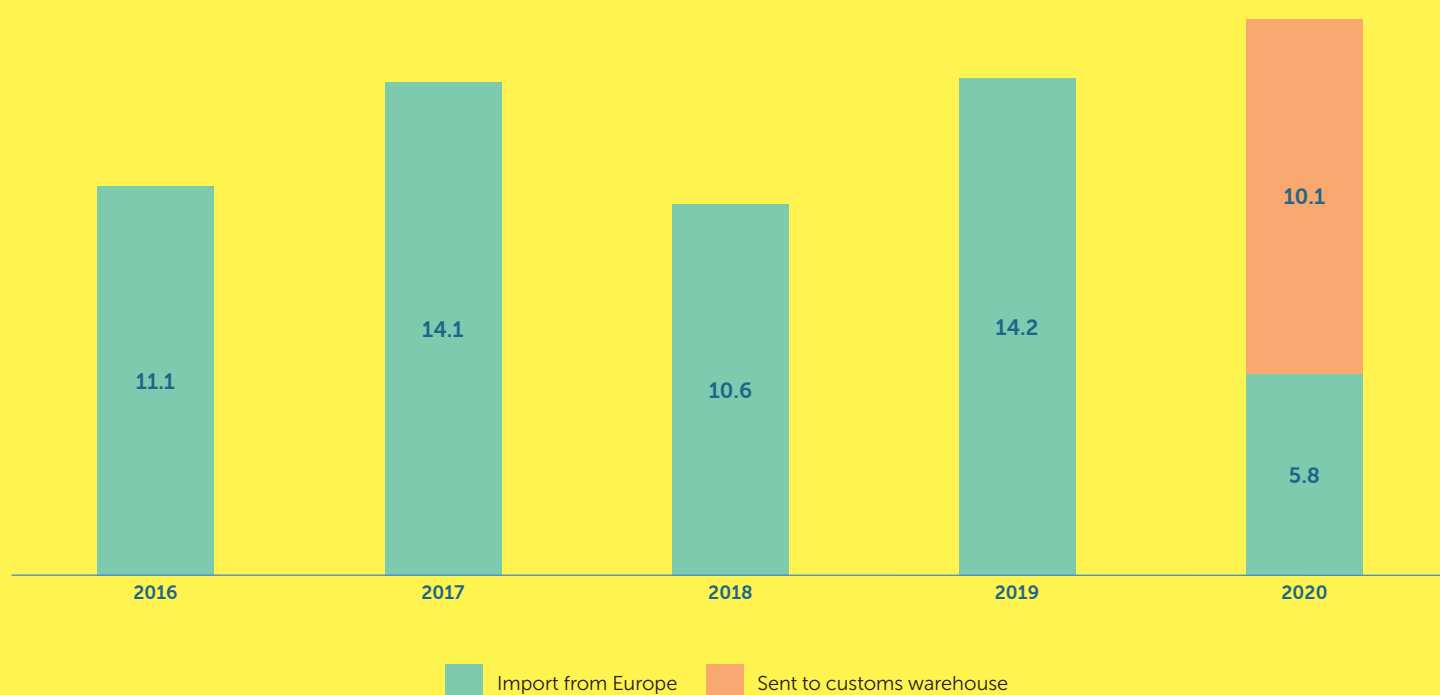
- for entry points: UAH 101.93 per 1 000 cm per day net of VAT;
- for exit points: UAH 124.16 per 1 000 cm per day net of VAT.

## GAS TRANSIT THROUGH UKRAINE (BCM/YEAR)



Source: GTS Operator of Ukraine.

## GAS TRANSPORTATION FROM EUROPE TO UKRAINE FOR THE PERIOD OF 2016-2020, BCM



Source: GTS Operator of Ukraine.

## UNDERGROUND GAS STORAGE FACILITIES

JSC Ukrtransgaz is the operator of the largest European complex of 12 underground gas storage facilities (UGS), one of which is located in the uncontrolled Ukrainian territories in the East. The total capacity of all underground storage facilities is about 31 bcm, which is more than a quarter of total European volume. The complex ranks 3rd in the world after the USA and Russia, with a maximum gas injection capacity of 252 million m<sup>3</sup>/day and a maximum natural gas withdrawal capacity of 260 million m<sup>3</sup>/day.

Two Ukrainian gas storage facilities have been established in the aquifers, the rest at the basis of depleted gas fields. The largest gas storage

facility is Bilche-Volytsko-Uherske UGS with a capacity of 17.05 bcm.

In 2020, the customs warehouse service was introduced, and international companies began to actively use Ukrainian underground storage facilities. The customs regime in question allows service customers to store natural gas in underground gas storage facilities of Ukraine for 1 095 days without paying taxes and customs duties.

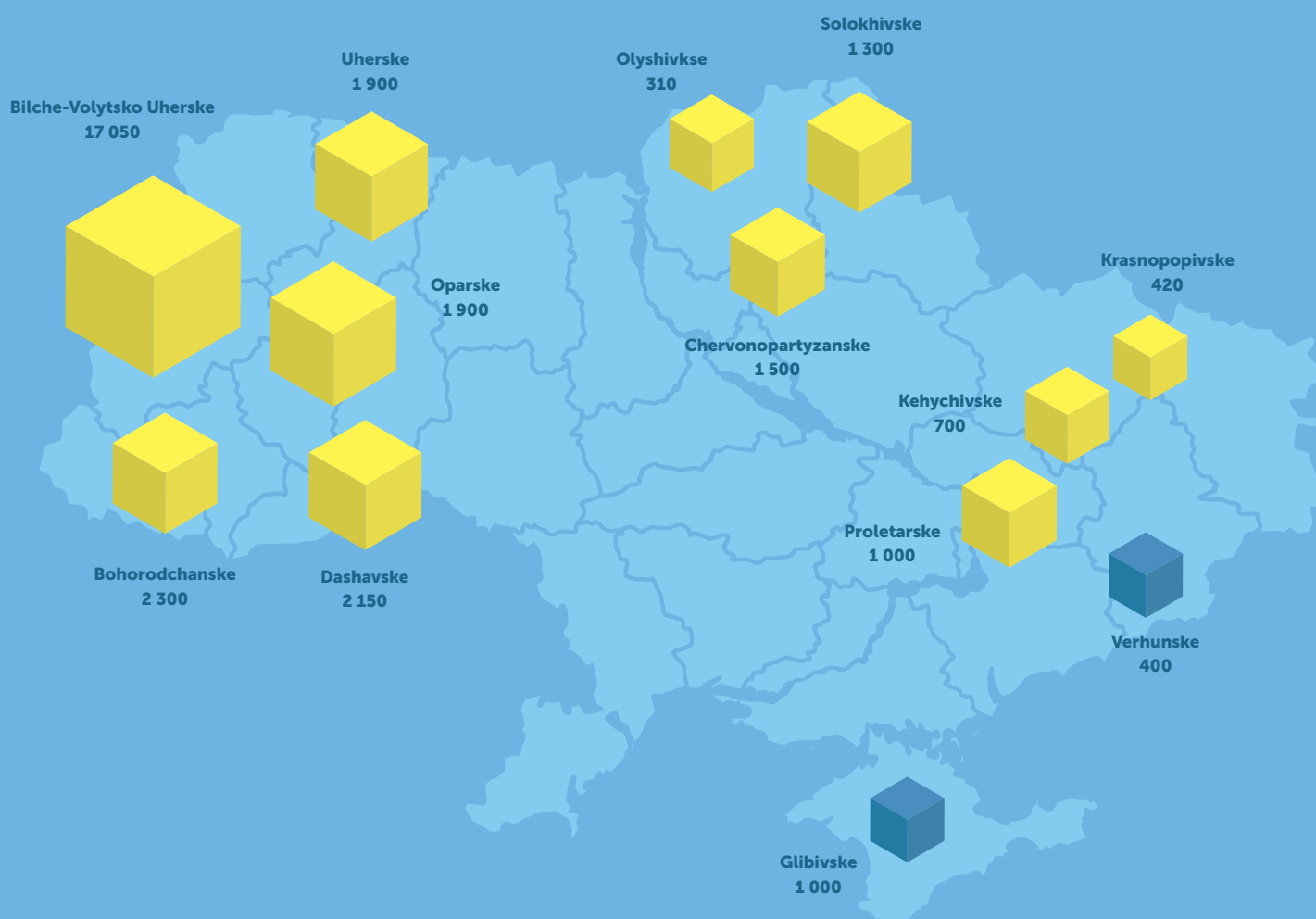
Administrative and legal opportunities have been created for the customs warehouse regime to function on the grounds of 10 gas storage facilities of JSC Ukrtransgaz

(Chervonopartizanske, Solokhivske, Bohorodchanske, Bilche-Volytske-Uherske, Uherske, Dashavske, Oparske, Kegychivske, Proletarske, and Krasnopopivske).

To obtain natural gas storage services in the customs warehouse regime, the following arrangements with JSC Ukrtransgaz are required:

- natural gas storage agreement;
- agreement on the provision of services for declaring natural gas moving across the customs border of Ukraine.

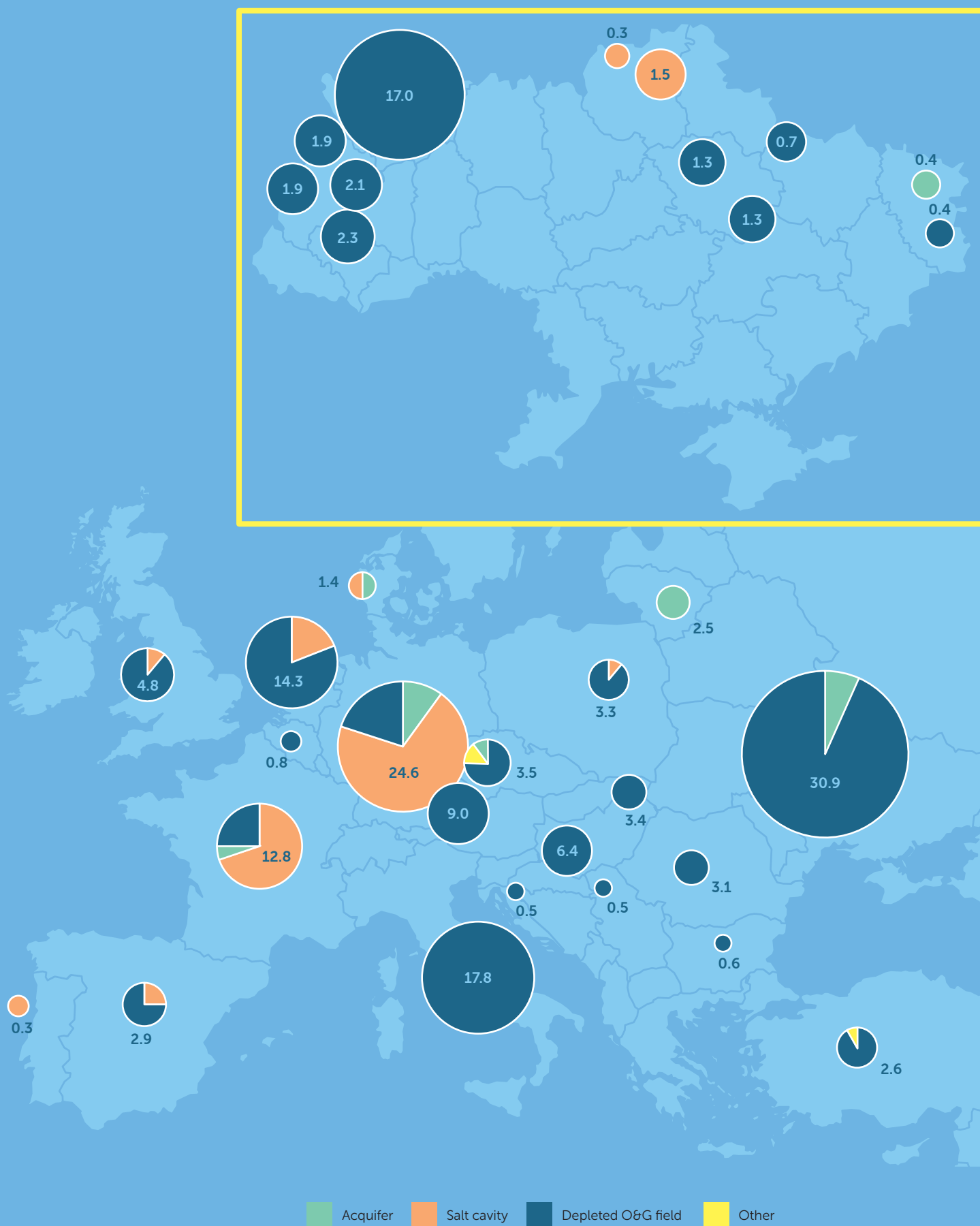
### MAP OF UKRAINIAN UGS FACILITIES, MCM



Source: Naftogaz Group.



UKRAINE GAS STORAGE CAPACITY IS MOSTLY CONSTITUTED OF DEPLETED OIL AND GAS FIELDS AND ACCOUNTS FOR MORE THAN 20% OF TOTAL EU CAPACITY

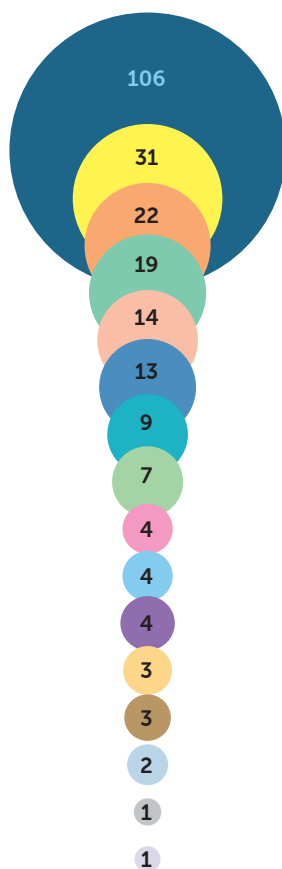


Note: Excluding Finland, Malta, Luxembourg, Slovenia, Sweden, Ireland, Greece, Cyprus and Baltics countries.  
Source: GSE (2016).

## UKRAINIAN GAS STORAGE CAPACITIES ARE THE LARGEST IN THE EU, STRATEGICALLY LOCATED NEAR THE WESTERN BORDER OF UKRAINE

### Storage capacities in Europe, bcm/year

- Total EU-28
- Ukraine
- Germany
- Italy
- Netherlands
- France
- Austria
- Hungary
- Poland
- Czech Rep
- Slovak Rep
- Spain
- Romania
- Latvia
- Denmark
- Belgium



### Products, currently offered by the Ukrainian SSO



Storage



Injection/Withdrawal



Customs Warehouse



Customs Warehouse + Short-Haul



Monitoring of charged gas in stock



Products with Ukrainian Energy Exchange

### Largest storage capacities in Europe

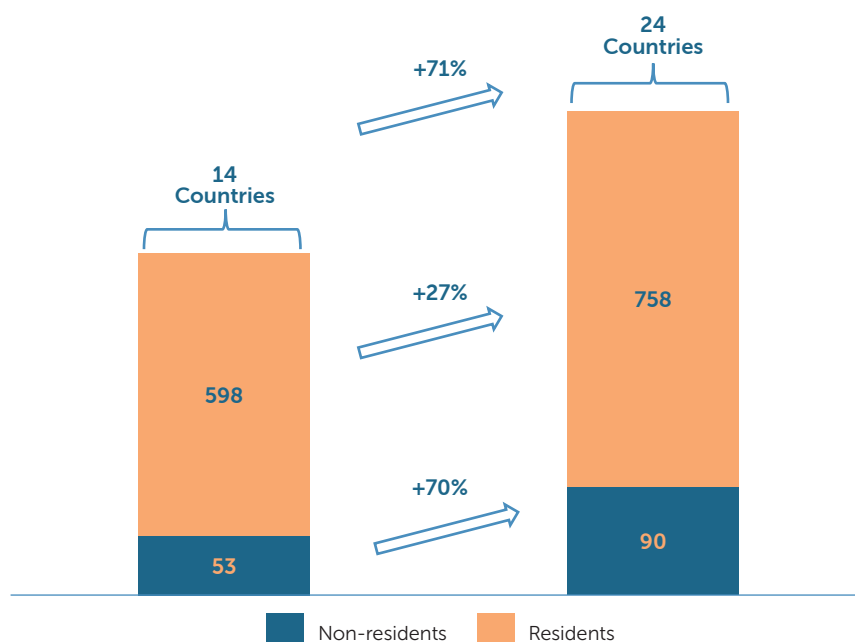
- **1/3** of storage capacities of the EU-28 with **25 bcm** at the EU border
- **10 bcm +** capacity available for shippers at attractive price

### Essential for the Europe's energy security

- Strategic location: gas supply from one point to **4 EU states**
- **Physical guarantee** of the security of gas supply in Europe

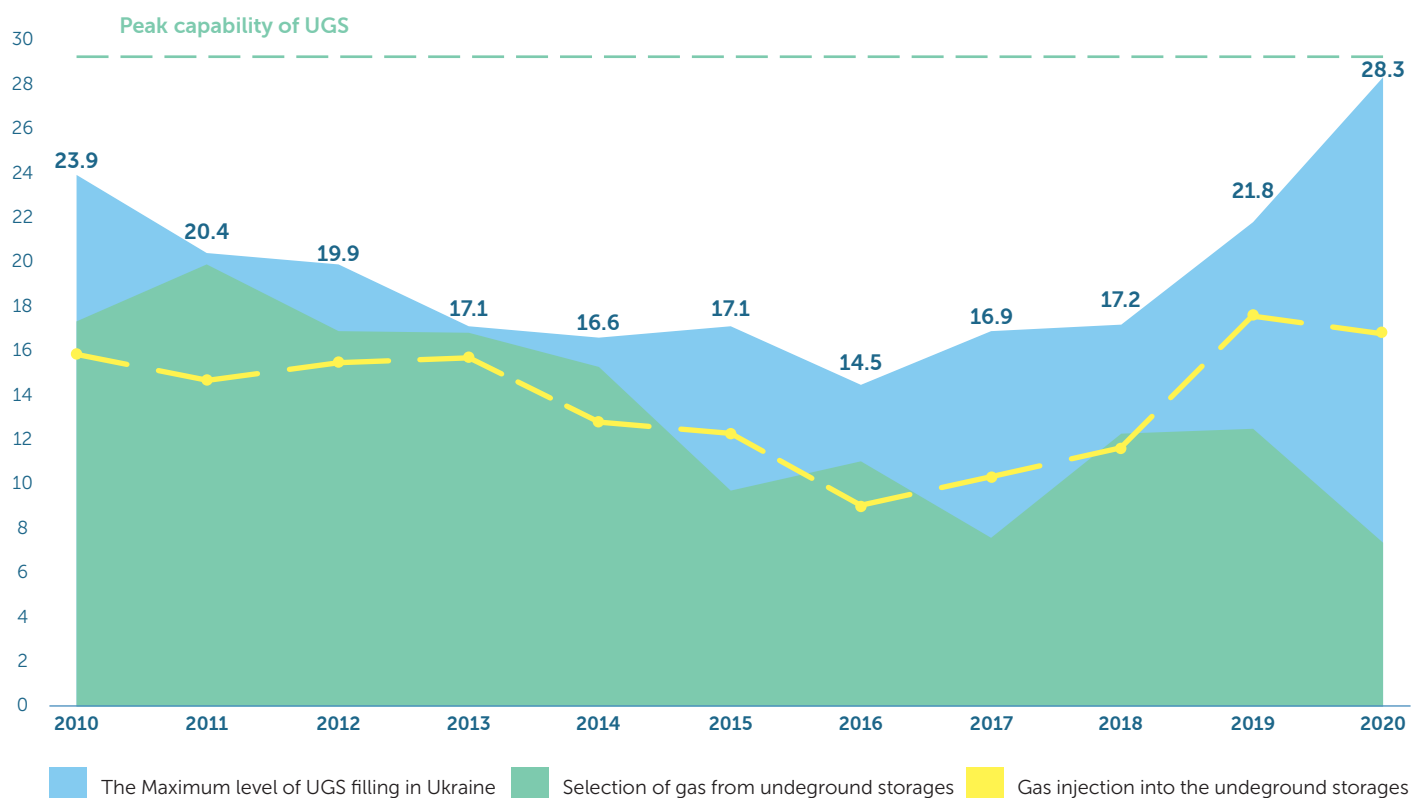
Source: AGSI Storage Data, December 2020.

## OVER THE LAST YEAR, THE NUMBER OF SERVICE CUSTOMERS OF UGS OPERATOR HAS INCREASED



Source: Naftogaz Group.

## THE LEVEL OF FILLING, INJECTION AND EXTRACTION OF GAS FROM UGS OF UKRAINE IN 2010-2020, BCM



Source: GTS Operator of Ukraine.

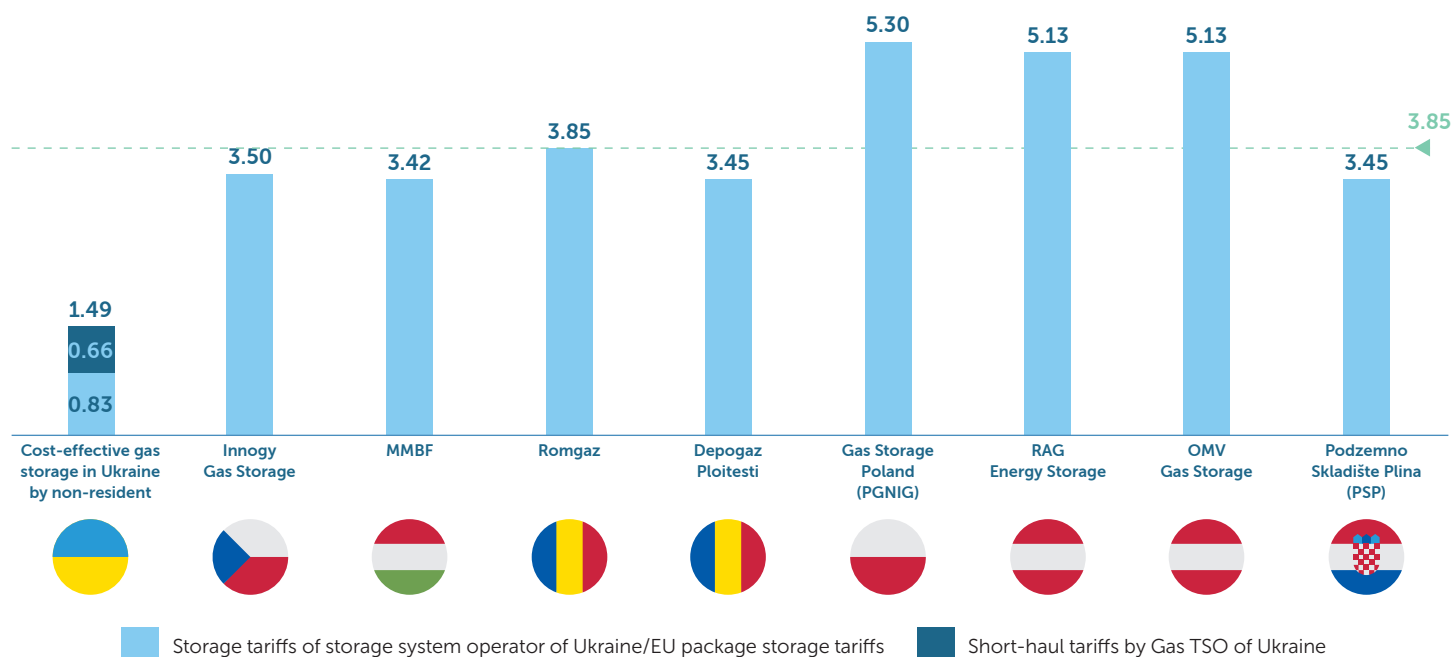
In June 2020, the development plan of the Gas Storage Operator of Ukraine was approved, according to which from 2020 to 2029 the operator plans to invest about \$500 mln in the development of the GTS, most of which will be invested in gas storage facilities located in the western part of Ukraine.

Due to the increase in the number of customers ordering services that store their gas in Ukrainian underground storage facilities, the process of the automation and simplification of natural gas storage administration is a key priority.

In March 2021, the accounting of natural gas stored in underground storage facilities under different customs regimes was automated: the normal customs warehouse regime and the short-haul. This allows each customer to tracking their gas consignments and the balance on them.

## UNDERGROUND GAS STORAGE TARIFFS, AS OF OCTOBER 2020

(Efficient gas storage costs in Ukraine compared to other Eastern and Central European markets from the EU client's perspective, EUR/MWh)



Note: Efficient gas storage costs in Ukraine compared to other Eastern and Central European markets from the EU client's perspective, EUR/MWh. Source: Naftogaz Group.

## PRICES

Since 2015, pricing for private companies and traders has been regulated by the concept of the free market. Currently in Ukraine there are no restrictions or price regulations.

There is no single price indicator for determining the price of natural gas in Ukraine. The main indicators of pricing are the average cost of imported natural gas and the resources trading price on one of the largest exchanges in the country – Ukrainian Energy Exchange (UEEX).

Although global prices reached historical lows in May 2020, European gas prices are still above those in the US, with TTF trading at a premium of 3.5 EUR/MWh to Henry Hub in 2020.

Ukraine has two strategic advantages for supplying natural gas to Europe: largest underground storage capacity in Europe and shortest transportation distance.

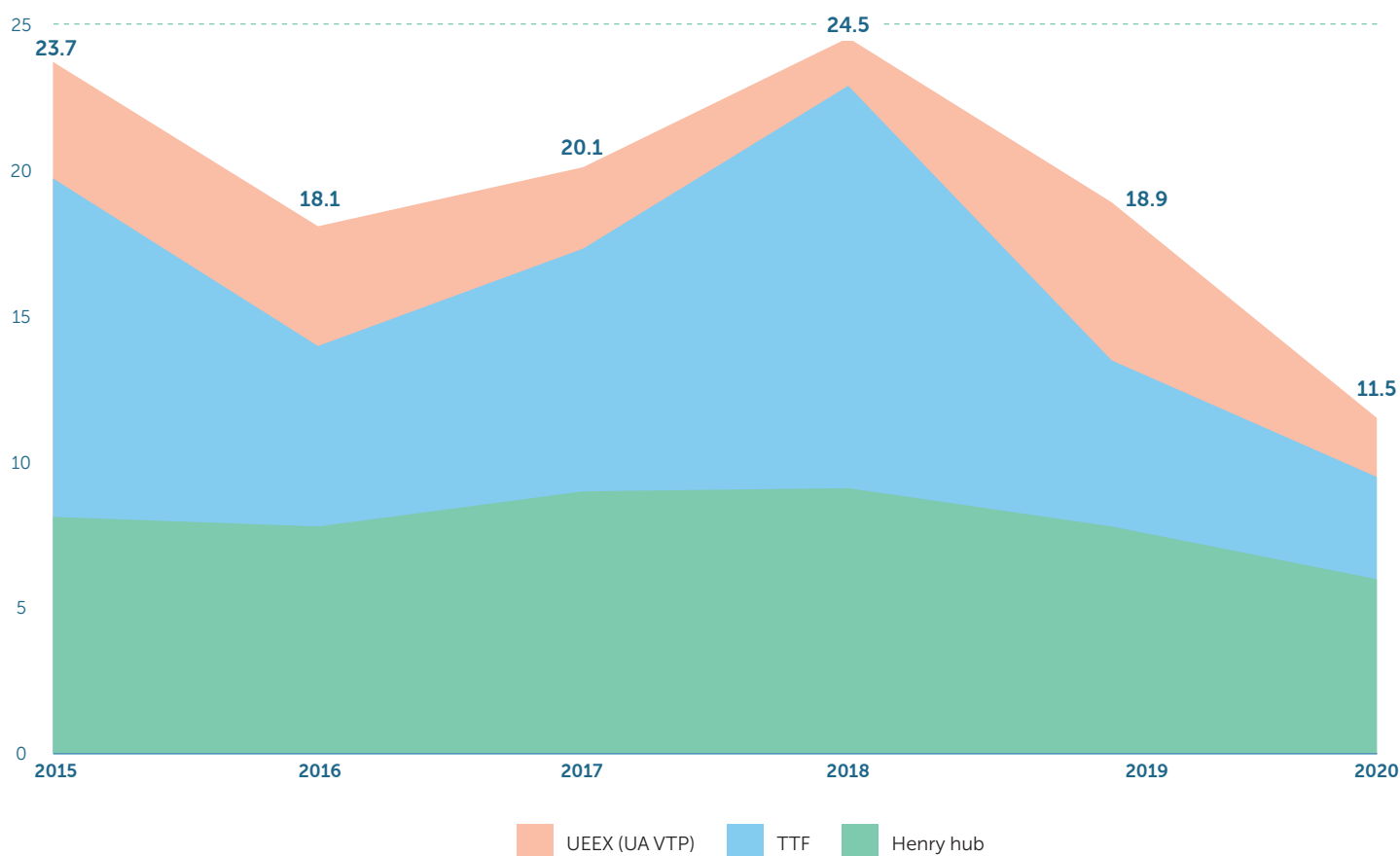
Supplying gas to EU countries is attractive because of high European gas consumption, which totalled 482 bcm in 2019. However, spot prices reached their lowest level this year making the European market rather unattractive in the long-term.

In contrast, Ukraine is a net gas importer (producing 10.7 bcm below its annual consumption in 2020), with UA VTP gas price trading at a premium to EU-based prices which could be beneficial for suppliers. Price setting in Ukraine is based on import parity that reflects market prices at European hubs (TTF and NCG).

In addition, the price spread can be set up in two possible ways: either as a trading markup between markets or as physical transportation cost (e.g. TTF – Ukraine).

As a result of such adjustment, natural gas in Ukraine trades at a premium to the EU market.

### PRICING IN UKRAINE AND ABROAD IN 2015-2020 (EUR/MWH)



Note: UEEX – weighted average price for all types of payment.  
Source: UEEX; Mineconomy; EIA; Powernext.

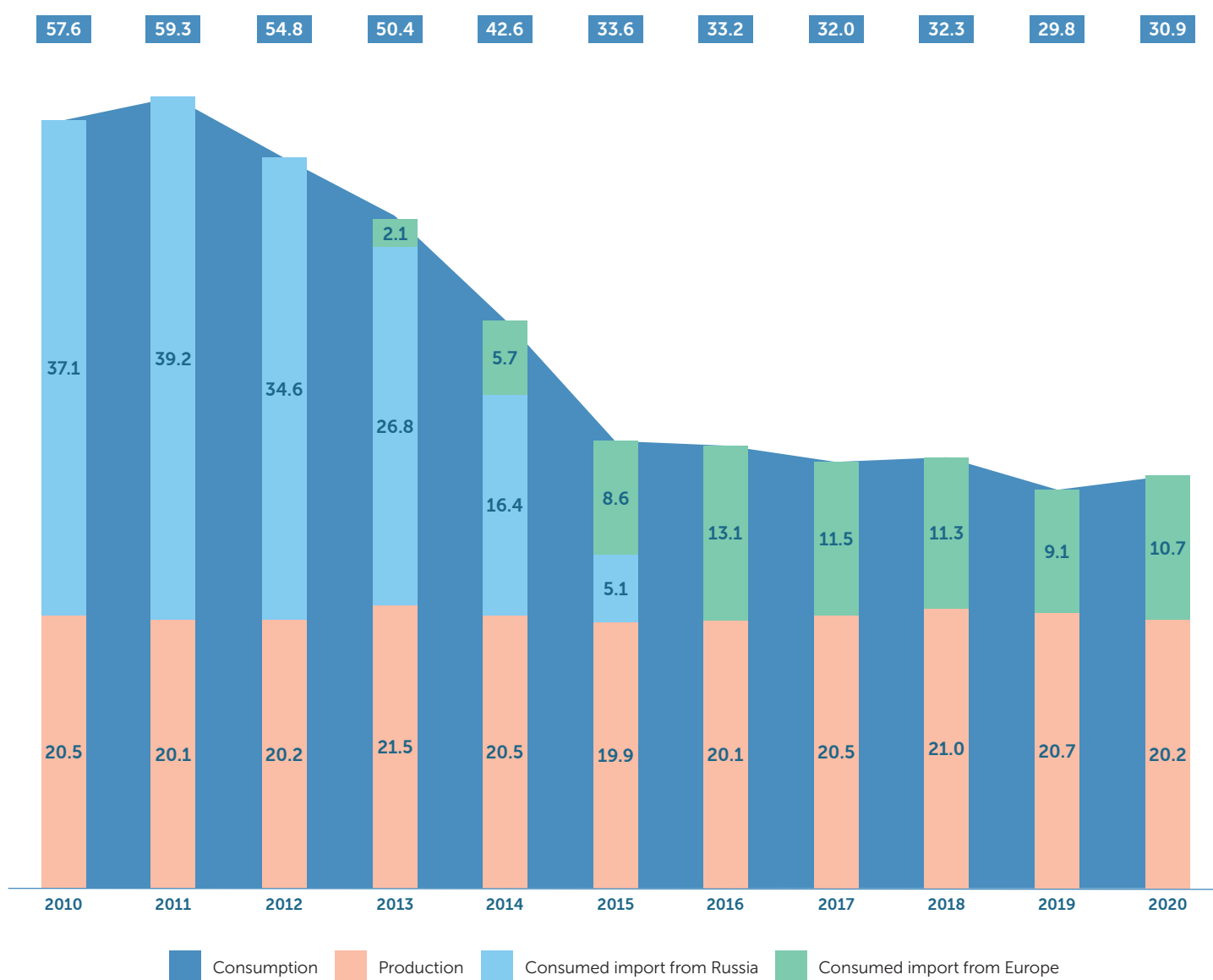
## COMPARISON OF PRODUCTION, IMPORTS AND CONSUMPTION

Since its inception, the development of the gas industry has been accompanied by the overall commercial progress. In the early 1990s, Ukraine entered the top 3 countries in Europe in terms of consumption and reached a historic high of almost 119 bcm.

Over the last 30 years, gas consumption has fallen by two thirds, and as gas fields have depleted in the wake of the active development of the Russian and Central Asian markets, Ukraine turned from an exporting state into an import-dependent one. The share of imports remains significant and accounts for at least 31% of total consumption.

Before 2015, the main supplier of gas to Ukraine was the Russian Federation. Gas conflicts constantly arose resulting of difficult relations between the countries, and the military aggression in 2014 became the starting point for levelling Russia's share in Ukraine's imported gas. Thus, in 2015, Ukraine completely refused to purchase natural gas from Russia's Gazprom due to the inflated price. Since then, gas has been imported exclusively from Western Europe.

### GAS MARKET BALANCE OF UKRAINE, BCM

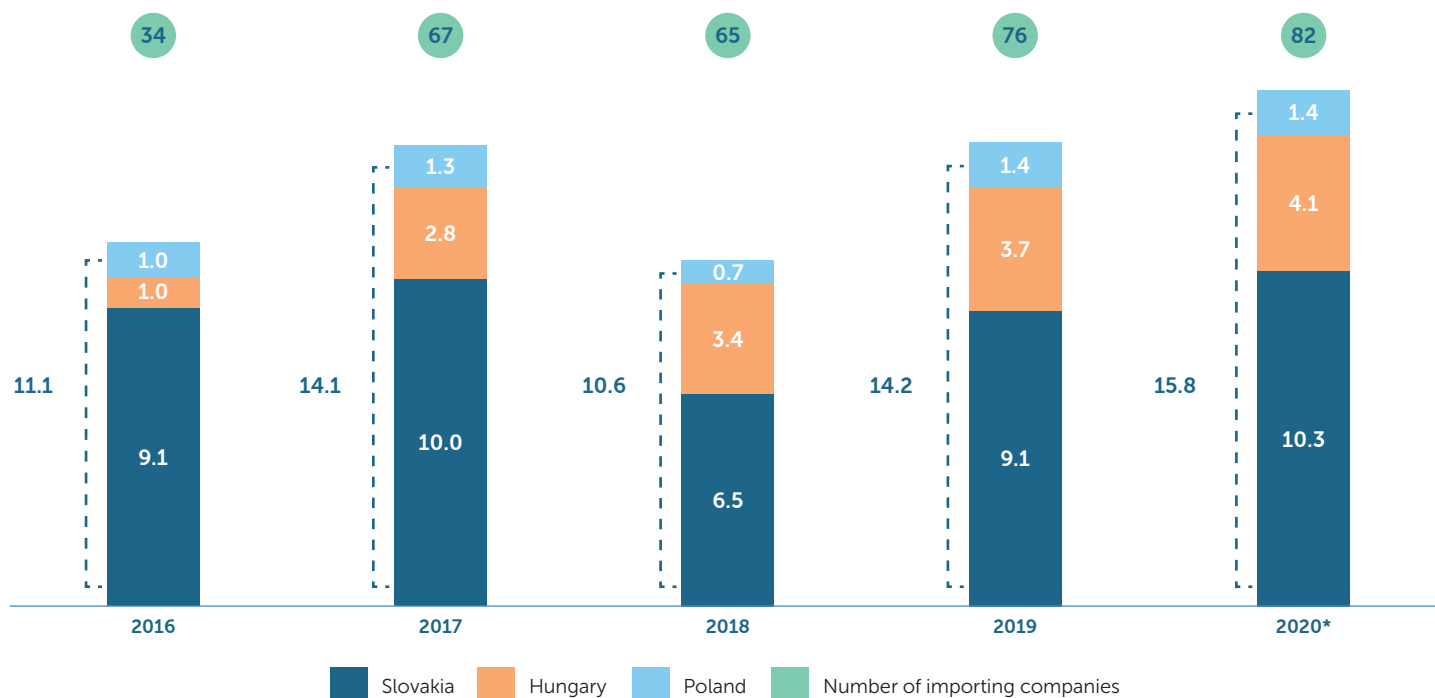


Source: Naftogaz Europe, GTS Operator of Ukraine.

To replace gas from the Russian Federation, the Law of Ukraine "On the Natural Gas Market" entered into force on 1 October, 2015, which provided an opportunity to diversify the import process, increase the number of foreign suppliers and open a free gas market in Ukraine. Thus, during 5 years the number of suppliers increased by 486%, from 14 to 82 (before the entry into force of the Law there were only 6).

Gas is imported to Ukraine from Poland, Hungary and Slovakia, the volume of which increased by 183% or 6.6 bcm over 5 years.

### IMPORT VOLUME BY COUNTRIES, BCM



\*of which 45% were imported by virtual reverse, 10.1 bcm were transmitted to the customs warehouse regime.  
Source: Naftogaz Group; GTS Operator of Ukraine.

In 2020, gas transportation from Europe to Ukraine amounted to 15.9 bcm, which is 12% higher than in 2019 and 27% higher than the average rate of the corresponding periods in 2016-2018. Imports from Slovakia amounted to 10.2 bcm (+11 % compared to the same period last year), from Hungary - almost 4.2 bcm (+ 14%), and from Poland - almost 1.5 bcm (+ 3%). In particular, 45% of all gas was imported via virtual reverse (backhaul), which first became available in early 2020.

Compared to 2019, total gas imports increased by 11.3%, with a physical flow share of 54% compared to 2019 due to the availability of virtual reverse alternatives. Total physical import flows to Ukraine in 2020 constituted 8.5 bcm of natural gas, while virtual reverse amounted to 7.3 bcm.

Virtual reverse flows from Poland have been available through the Drozdovichi gas metering station since the middle of January 2020. In 2020, 1.0 bcm of natural gas as a virtual reverse flow was imported via the Polish route. Virtual reverse flows from the Slovak Republic (through the connection point Velke Kapushany – Uzhhorod) and Hungary (through the Bereg single virtual interconnection point (a merger of IP Beregovo and IP Beregdaroc) were launched on 1 March 2020 and 1 May 2020 respectively. Until the end of 2020, Ukraine imported 3.2 bcm of natural gas from Hungary and 3.1 bcm from Slovakia via virtual reverse flow.

In 2020, Ukraine's main gas supply route (including virtual reverse supply) was through the Slovak Republic. During 2020, deliveries through the Slovak Republic, Hungary, and Poland amounted to 65%, 26%, and 9% in total imports respectively compared to 64%, 26%, and 10% in 2019.

On 1 January, 2020, the TSO of Ukraine introduced a short-haul service, which allows a company's customers to order gas transmission between Eastern European countries through Ukraine at a favourable tariff rate. Together with customs warehouse service by Ukrtransgaz, foreign and domestic clients are offered convenient and attractive conditions of gas storage in the Ukrainian UGS. As of 1 January 2021, foreign traders stored 7.7 bcm of natural gas in the customs warehouse service. This is 3.8 times more than in the same period a year earlier. 4.7 bcm of this gas was accumulated in short-haul mode. Residents kept 0.9 bcm of natural gas in the customs warehouse, including 0.5 bcm of gas transferred to the UGS in short-haul service. Since November 2020, withdrawals of gas from the customs warehouse began with its further export to the EU.

A total of 82 traders ordered gas transmission services from the EU to Ukraine in 2020, including 52 Ukrainian companies and 30 foreign companies. Short-haul and customs warehouse services were used by more than 50 companies, most of which were non-residents.

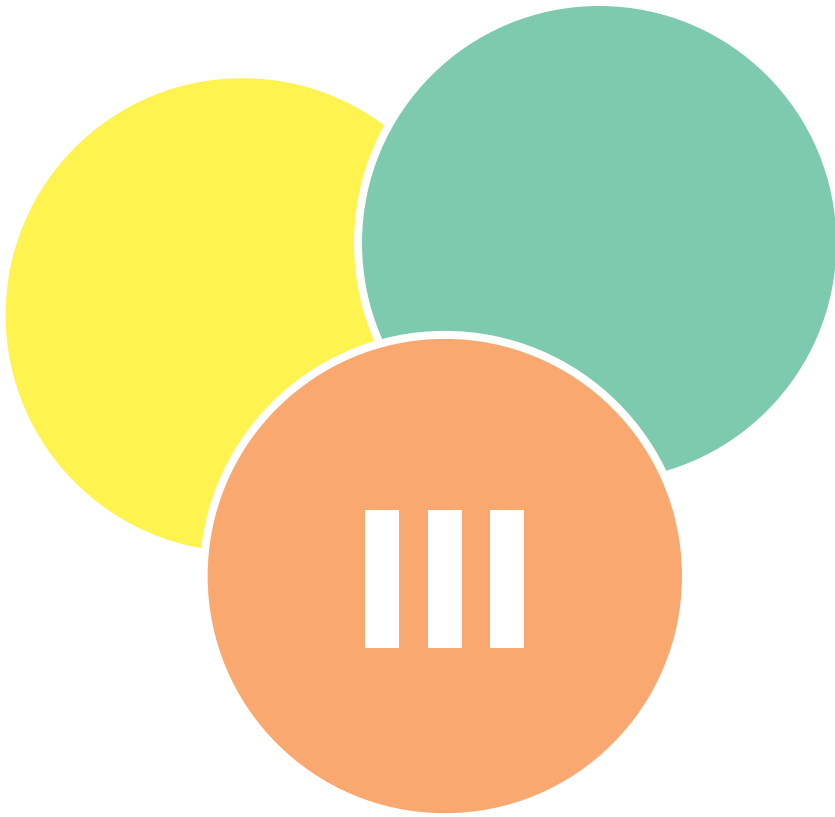
Ukraine's economy presently remains heavily dependent on the imports of natural gas, oil and petroleum products, the procurement of which amounts to more than \$10 billion annually. This situation poses a risk to the country's energy security, as the vast majority of these imports are of Russian origin and are supplied to Ukraine directly or indirectly as manufactured products or reverse gas from Europe.

## KEY RESULTS OF THE WHOLESALE GAS MARKET 2020

Total sales of natural gas on the Ukrainian Energy Exchange (UEEX) increased to 2.5 bcm, which is 6.5 times more than in 2019. Development and the introduction of a new short-term market (day-ahead and intraday markets) on the UEEX made it possible to improve the liquidity of the market participants' portfolios.

The implementation of new instruments (paying options) on the UEEX, such as sales of natural gas with post payment terms using a bank guarantee, extended the post-payment period from 30 to 45 days, and the introduction of quarterly products (fixed price for the supply during Q4 2020/Q1 2021).

One of the progress indicators is an annual evaluation of the European Federation of Energy Traders (EFET) that rates trading conditions in a specific country with a maximum grade of 20 points. Britain's NBP, the first gas hub, remains the market leader with a maximum score. TTF and NCG hubs, which are the main indicators for Ukrainian traders, have solid scores of 17.5-19.5 points respectively. According to 2020 data, Ukraine received 9 points. However, only seven years ago, Ukraine did not even feature on the European gas map. In 2017, Ukraine first appeared in the annual EFET evaluation report, when the country's gas market was just opening.



**Reformation of the sector  
for the last 5 years**

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## PSA TENDERS









In 2019, Ukraine held the largest wave of tenders for the conclusion of production sharing agreements and offered investors 12 promising oil and gas blocks with a total acreage of 11,000 sq. km.

At the end of 2020 and the beginning of 2021, 8 production sharing agreements were signed with leading Ukrainian gas production companies: Naftogaz Group, DTEK Naftogaz, Geo Alliance Group, Zakhidnadraserwis, and with the American company Aspect Energy. All companies together obliged to invest




at least \$ 400 million in new developments over the next five years and drill 39 exploration wells.

Three more PSAs - with the British company York Energy and the European energy holding EPH (Nafta), are in the process of agreeing the texts of arrangements. Their signing is expected by the end of 2021. The minimum investment in the development of these blocks in the first five years will be \$ 70 million.

### SIGNED PSAS

Field/block	Location (regions)	Acreage, sq.km	Winning company
Buzivska	Kharkiv Dnipropetrovsk	670	 <b>NAFTOGAZ</b> GROUP
Berestyanska	Lviv Kharkiv	286	 <b>NAFTOGAZ</b> GROUP
Balakliyska	Kharkiv	1 119	 <b>NAFTOGAZ</b> GROUP
Ivanivska	Kharkiv	842	 <b>NAFTOGAZ</b> GROUP
Zinkivska	Sumy Poltava	571	 <b>DTEK</b>
Sofiyivska	Chernihiv Sumy Poltava	2 716	 <b>GEO ALLIANCE</b> GROUP
Varnyvka	Chernihiv Poltava	3 471	 <b>ASPECT HOLDINGS, LLC</b>
Uhnivska	Lviv Ivano-Frankivsk	967	 <b>ZAKHIDNADRA</b> SERVIS

### PSA AT THE NEGOTIATION STAGE

Field/block	Location (regions)	Acreage, sq.km	Winning company
Okhtyrka	Sumy Poltava Kharkiv	672	 <b>EPH</b>
Ichnyanska	Chernihiv	2 086	 <b>YORK ENERGY HOLDINGS</b> LIMITED
Grunivska	Sumy Poltava	1 082	 <b>EPH</b>

Source: Ministry of Energy of Ukraine, AGPU.

## UNLOCKING STRATEGIC EXPLORATION ASSETS – YUZIVSKA AND THE BLACK SEA

2020 was a historic year for the Ukrainian gas exploration and production sector, as the Ukrainian government unlocked several strategic exploration assets, that had been unavailable for exploration since 2014. The Yuzivska PSA block and 36 blocks in the exclusive maritime zone of the Ukrainian part of the North-Western Black Sea with a total acreage of more than 28 thousand sq.km were given on an exclusive basis to Naftogaz for exploration and further development.

These actions were taken in line with the Ownership Policy of Naftogaz, which was adopted by the CMU on 21 October 2020, and reflects the government vision of Naftogaz's role as a National oil and gas company, which has to become a catalyst of the oil and gas industry development to meet, among others, the following strategic goals:

- security of gas supply;
- achievement of energy independence, in particular from natural gas imports;
- energy sector transformation and completion of natural gas market reform.

By obtaining these blocks, Naftogaz has taken on a significant obligation for their rapid de-risking, committing to invest over \$600 mln in 3D seismic and E&A drilling over the next 5 years. Naftogaz is rapidly progressing with its exploration program, and in May 2021 issued FID to shoot 20 000 sq.km of 3D seismic offshore, signing a contract with Norwegian PGS. Seismic activities will start in Q3 2021. In addition, the first exploration wells in the Yuzivska PSA to be spud in Q4 2021.



## ELECTRONIC OIL AND GAS AUCTIONS ON THE PROZORRO.SALE PLATFORM

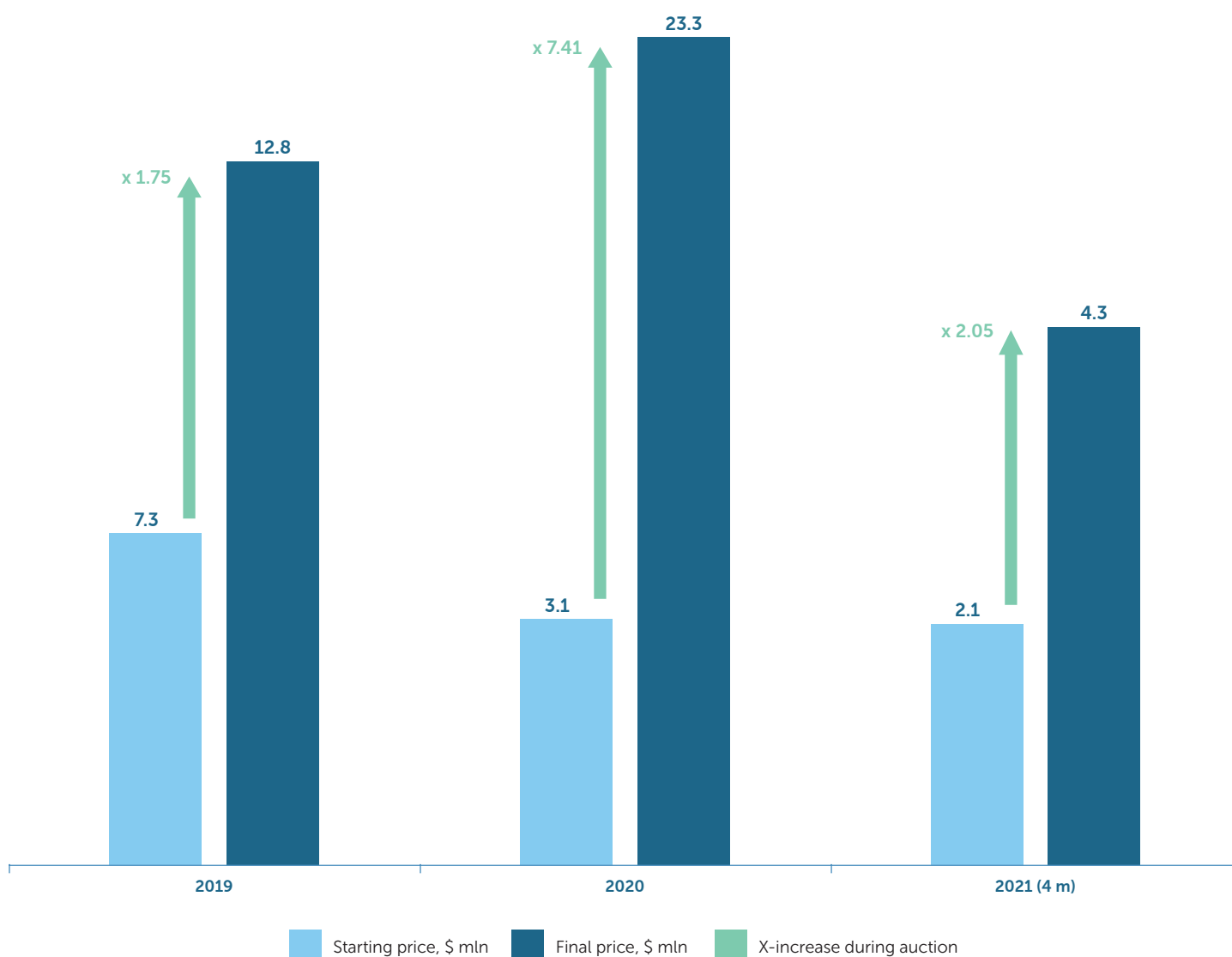
The oil and gas industry was the first of all extractive industries to launch the sale of the mineral rights via the online platform ProZorro.Sale. The advantages of this procedure include: no pre-qualification requirements and minimal communication with the authorities, 90 days period to study the auction materials. The bidding takes place in 3 rounds and the winner is the one who offers the highest price for a respective lot.

Since 2019, 22 blocks with a total acreage of almost 3 600 sq.km have been sold via electronic auctions. The state-owned company UkrGasvydobuvannya (Naftogaz Group) has won the majority of the permits for 15 blocks. Leading domestic gas production companies and a foreign investors from Europe have also won several oil and gas blocks.

One of the sites, Budyschansko-Chutivska, was sold for \$23.7 mln, which was a absolute record for the sale of a oil and gas mineral rights. As a result of competitive bidding, the price for this lot increased by 700% or 8 times compared to the starting price.

The Investment Atlas currently offers 40 oil and gas blocks, each of which contains descriptive information and availability of the geological data. All this information is located at the UGS website [www.geo.gov.ua](http://www.geo.gov.ua).

### OIL AND GAS MINERAL RIGHTS COST ON THE AUCTIONS, \$ MLN



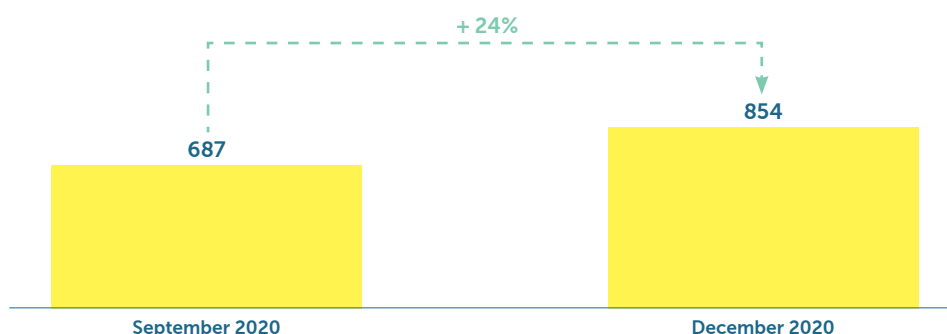
Source: Ukrainian Geological Survey.

## PRODUCTION ENHANCEMENT CONTRACT

In 2018, Ukrgasvydobuvannya (Naftogaz Group) announced the first full-fledged service contract for the intensification of production in mature and depleted fields (Production Enhancement Contract - PEC). In essence, this contract, a new legal framework for partnership in upstream was introduced to the Ukrainian market.

According to the results of the open tender, the international company Expert Petroleum was engaged to increase production of hydrocarbons at 13 fields of Ukrgasvydobuvannya in Western Ukraine. In the first 5 years of cooperation, the Western partner undertook to invest about UAH 1 billion (\$30 million at the forecast rate) in intensification, drilling and infrastructure development, and, potentially, to make additional investments in the future.

### MONTHLY AVERAGE DAILY NET PRODUCTION RATE, THOUSAND CM



Source: Naftogaz Group.

In 3 months, Expert Petroleum managed to increase the daily production rate from 13 fields by 24%.

The partnership between Naftogaz and Expert Petroleum will provide at least additional 300 million cubic meters of gas at 13 small fields in Western Ukraine during 5 years.

### PEC MAP WITH EXPERT PETROLEUM

#### Field locations



#### Key field parameters of PEC

Number of fields	13
Natural gas 2P reserves as of 1 January 2020, bcm	5
Natural gas production for 2019 year, mcm	319
Number of wells (incl. abandoned wells)	269
Number of active wells	140
Acreage, sq. km	386
Average depth, m	880
Depletion as of 1 January 2020, %	80

PEC fields
  Other Ukrgasvydobuvannya fields
  Other companies' fields

Source: Naftogaz Group.

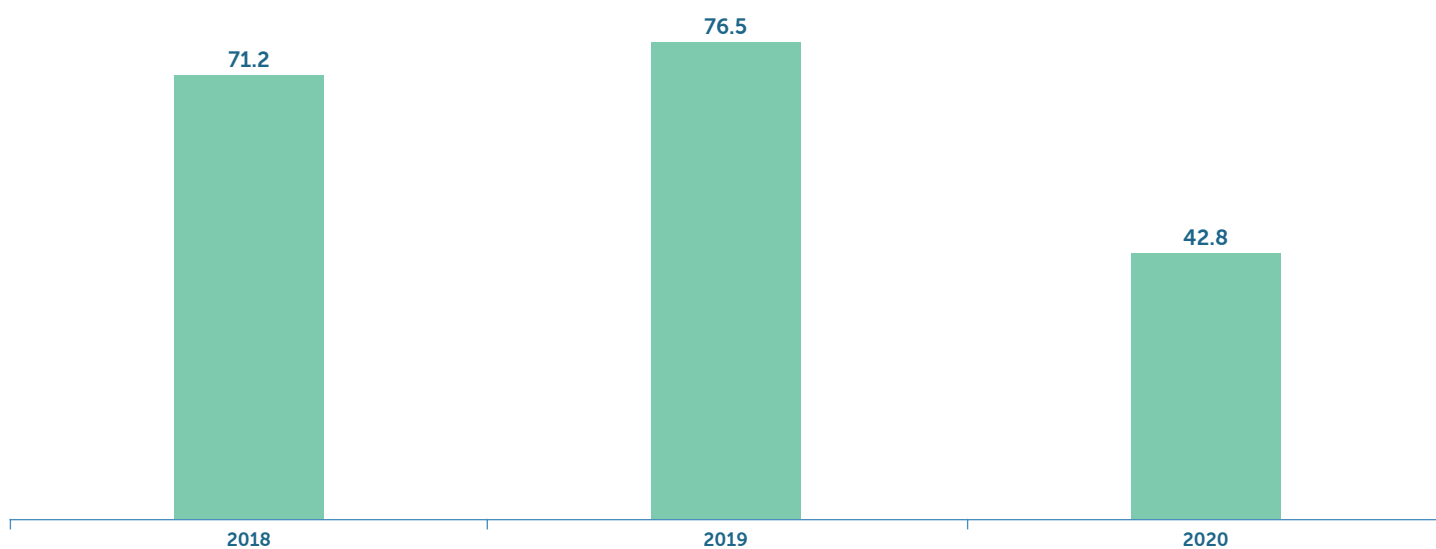
## DECENTRALISATION OF ROYALTY FOR HYDROCARBONS SUBSOIL USE

Amendments made to the Budget Code in 2017 established 5% of the royalty for hydrocarbons subsoil use deduction to local budgets (previously, 100% of the royalty was credited to the general fund of the state budget).

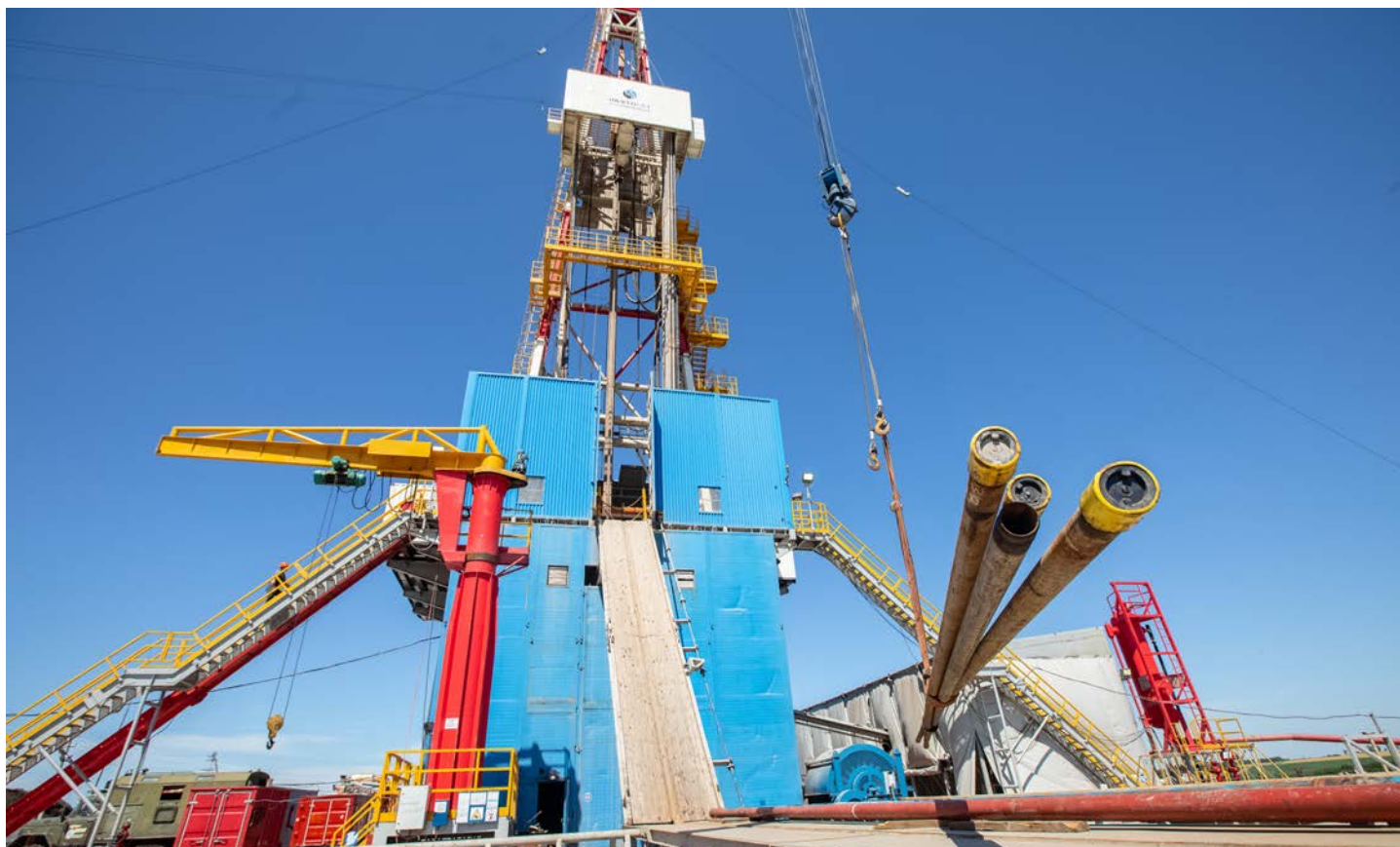
This changes to increased the interest of local communities and authorities in the production of oil, natural gas and gas condensate in their territories.

During the 2018-2020 years, a deduction of 5% of royalty to local budgets from the production of natural gas, oil and condensate amounted to \$190.5 mln.

### 5% OF THE ROYALTY FROM PRODUCTION OIL AND NATURAL GAS TO THE LOCAL BUDGET, \$ MLN



Source: Ministry of Finance of Ukraine.





## INCENTIVE TAXATION FOR NEW WELLS' DRILLING

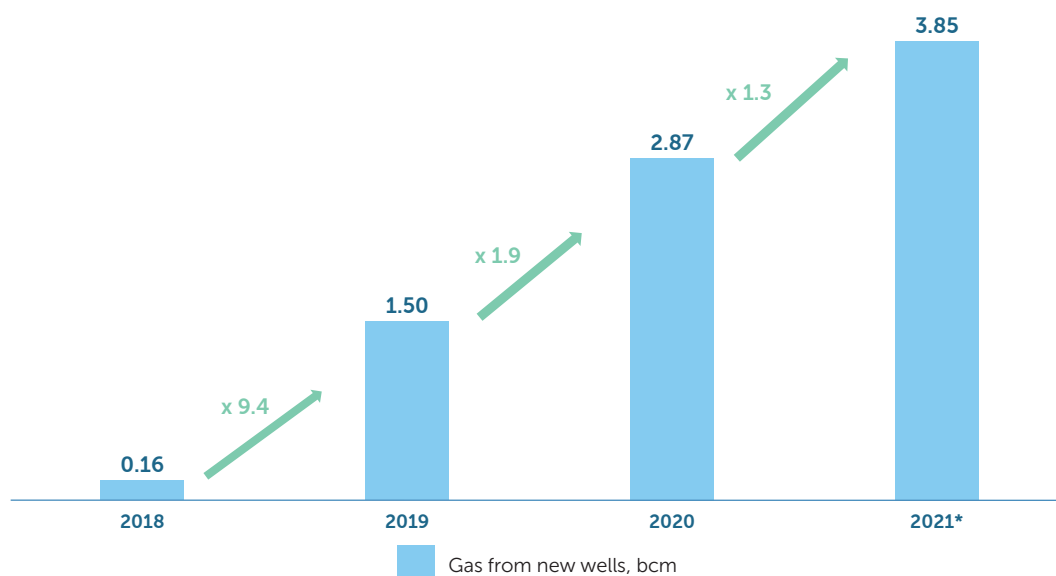
Incentive taxation for drilling new gas wells was adopted at a 6/12% tax rate in Ukraine in 2018. During the three years of this rule being operative, 273 new gas wells were drilled.

The share of gas produced from new wells in the total volume is growing every year: in 2018 it was 1% and reached 14% in 2020. Totally, an additional 4.5 billion bcm of gas has been produced in

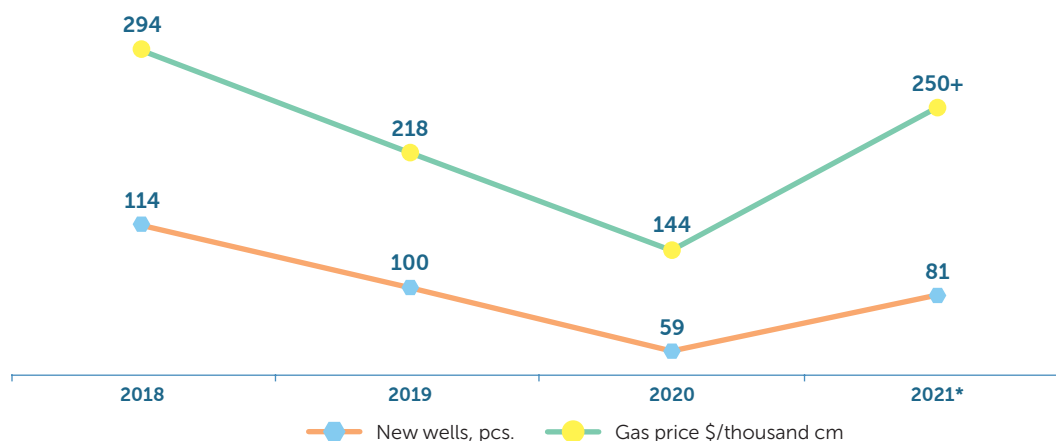
Ukraine in three years. The peak of drilling new wells was in 2018, while the market environment was positive, which contributed to the advent of the leading service companies in Ukraine.

Incentive taxation motivates investors to invest in new drilling and is an effective mechanism to combat the natural decline in gas production and the depletion of fields.

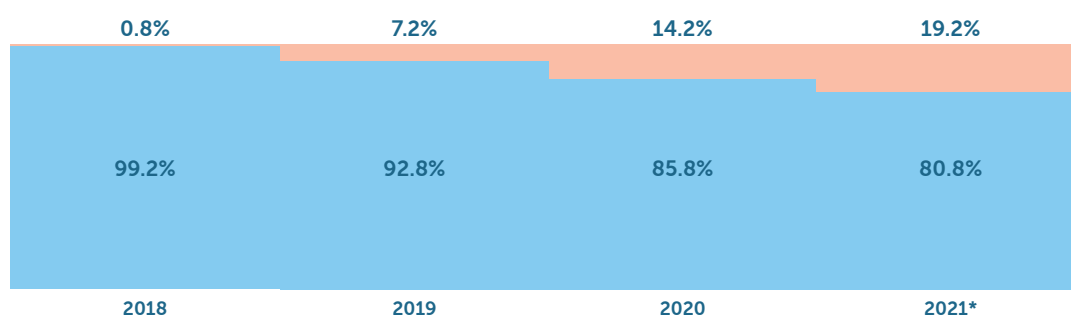
### VOLUME OF NATURAL GAS PRODUCTION FROM NEW WELLS, BCM



### CORRELATION OF NATURAL GAS PRICES AND NUMBER OF DRILLING OF NEW GAS WELLS, 2018-2021



### THE SHARE OF GAS FROM NEW WELLS, IN TOTAL PRODUCTION, %



## OPENING ACCESS TO GEOLOGICAL INFORMATION

On 7 November, 2018, a new procedure for the disposal of geological information was approved, containing further key modifications:

- State geological information accumulated in reports will be available free of charge in open access. These are data on areas where oil and gas could potentially be discovered. Investors will be able to independently research them online and nominate areas for submission to upcoming oil and gas auctions. The cost of open geological information will be reimbursed by the winner of the auction.
- Data concerning other geological information, including privately-owned information, will be outlined in the open state Catalogue. It will contain a list of geological works (without disclosing their contents), which were carried out by the subsoil user on the respective licensed area, and its contacts. The analysis will allow a complex picture of the region to be seen and will promote cooperation among subsoil users.
- The requirement for prior approval of the transfer of geoinformation by the subsoil user has been replaced by simply providing the relevant notification. It is available to check who owns the data (using the Catalogue) before purchasing it.

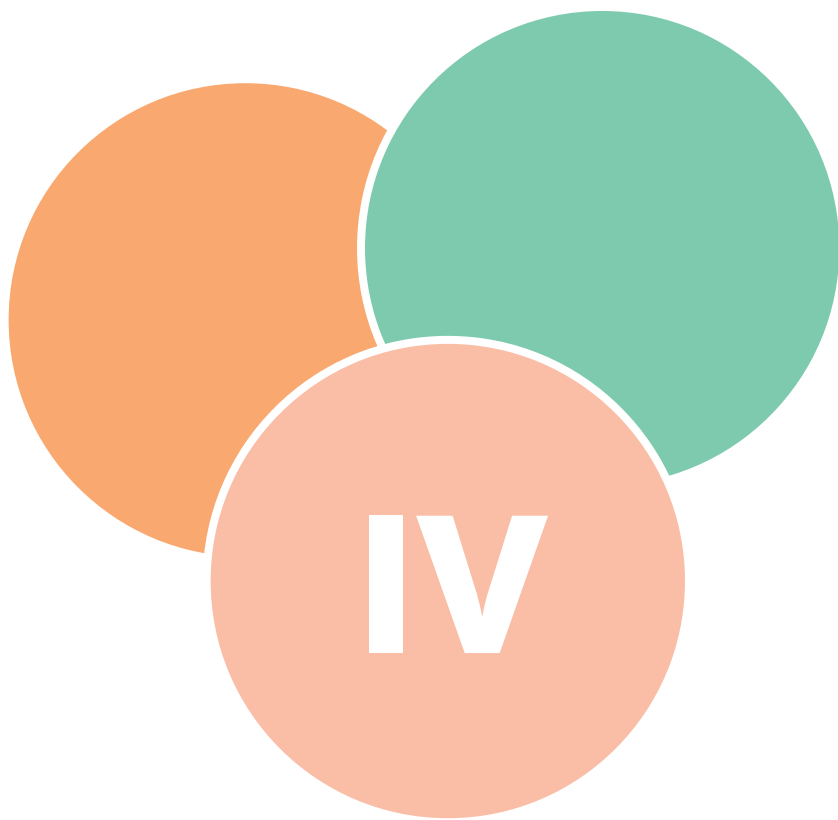
This decision not only ensures transparency and accessibility in the use of Ukrainian subsoil, but also eliminates an unreasonable regulatory burden on business entities during the disposal of such data.

To become acquainted with basic geological data, such as seismic data, the investor has the opportunity to send an official request to the Ukrainian Geological Survey, or to other public undertakings that possess the information in question. Primary geological data are available free of charge in the premises of the respective institutions.

In 2020, the Ukrainian Geological Survey began to publish e-Protocols for the approval (approbation) of mineral reserves on the official website of Geoinform of Ukraine, and also opened free access to online registers, including the register for oil and gas wells.

In 2021, an e-cabinet, is planned to be launched to simplify the passing of permitting procedures.





## **Legal framework, tax and fiscal policies in the industry**

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## REGULATORY AUTHORITIES

### THE MAIN REGULATORY AUTHORITIES OF THE OIL AND GAS SECTOR

**Verkhovna Rada (the Parliament of Ukraine)** – passes primary legislation.

**Cabinet of Ministers of Ukraine (CMU)** – passes secondary legislation implementing the primary legislation.

**Ministry of Energy** – implements state policy in the oil and gas sector.

**State Labour Service of Ukraine** – implements state policy on industrial safety and labour protection.

**Ministry of Environmental Protection and Natural Resources** – responsible for implementing the environmental protection policy of the state.

**Ukrainian Geological Survey** – issues subsoil licenses\*, monitors activities of the subsoil users and imposes sanctions for infringement of the subsoil use terms.

Note: \*such licenses in Ukraine are called "special permits for subsoil usage".  
Source: CMS.

## LICENSING SUBSOIL USE

The right to use the subsoil is granted via licensing. However, a license holder does not own any mineral resource until its extraction from the subsurface. Ukrainian Geological Survey issues the following types of licenses for oil and gas operations:

Activity	Duration
Exploration	Up to 3 years for mineral resources of local importance, and up to 5 years for mineral resources of state importance
Exploration, including pilot commercial production of deposits of state importance (including hydrocarbons)	Up to 5 years for onshore operations and up to 10 years for offshore hydrocarbons
Production	Up to 20 years for onshore operations, and up to 30 years for offshore hydrocarbons
Combined exploration and production of hydrocarbons	Up to 20 years for onshore operations, and up to 30 years for offshore operations
Operations under a production sharing agreement	Up to 50 years

Source: CMS.

A license usually serves as a basis for obtaining of other permitting documents required for development of the subsoil (including necessary land-use rights from land owners).

A license is supplemented by a subsoil use agreement.

License



The Subsoil Use Agreement, providing for:

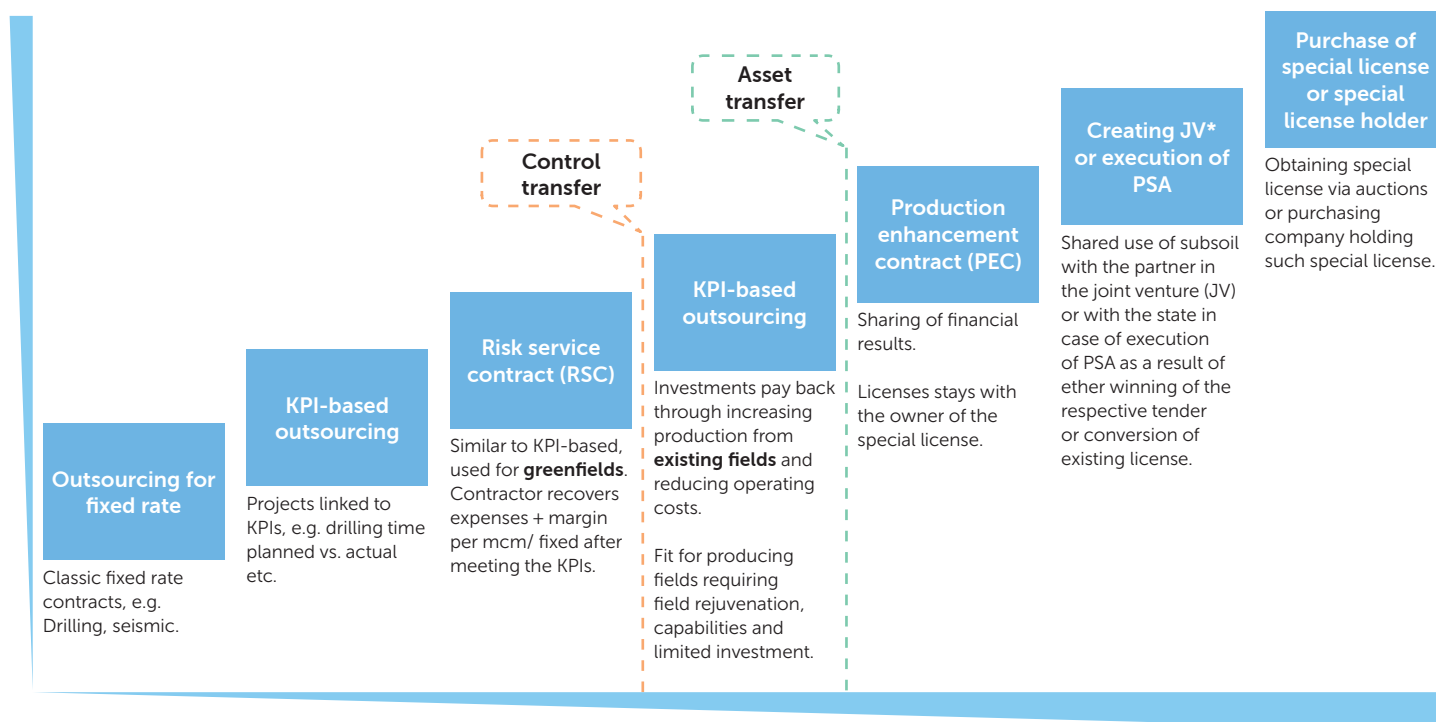
- general terms and conditions of subsoil;
- short description of the subsoil area;
- mandatory work programme and timeline;

## WAYS TO ACQUIRE OR PARTICIPATE IN OIL AND GAS PROJECTS IN UKRAINE

There are a number of ways to invest in oil and gas exploration and production projects in Ukraine. The image below illustrates their differences.

### DIFFERENT FORMS OF INVESTMENT IN OIL AND GAS EXPLORATION AND PRODUCTION PROJECTS IN UKRAINE DEPENDING ON RISK / REWARD LEVEL AND CONTROL OVER THE ASSETS

#### Incentives / Risks



#### Transfer of rights

Note: \*joint Activity is not available in Ukraine on practice due to very high royalty (70%) in comparison to concession (up to 29%).

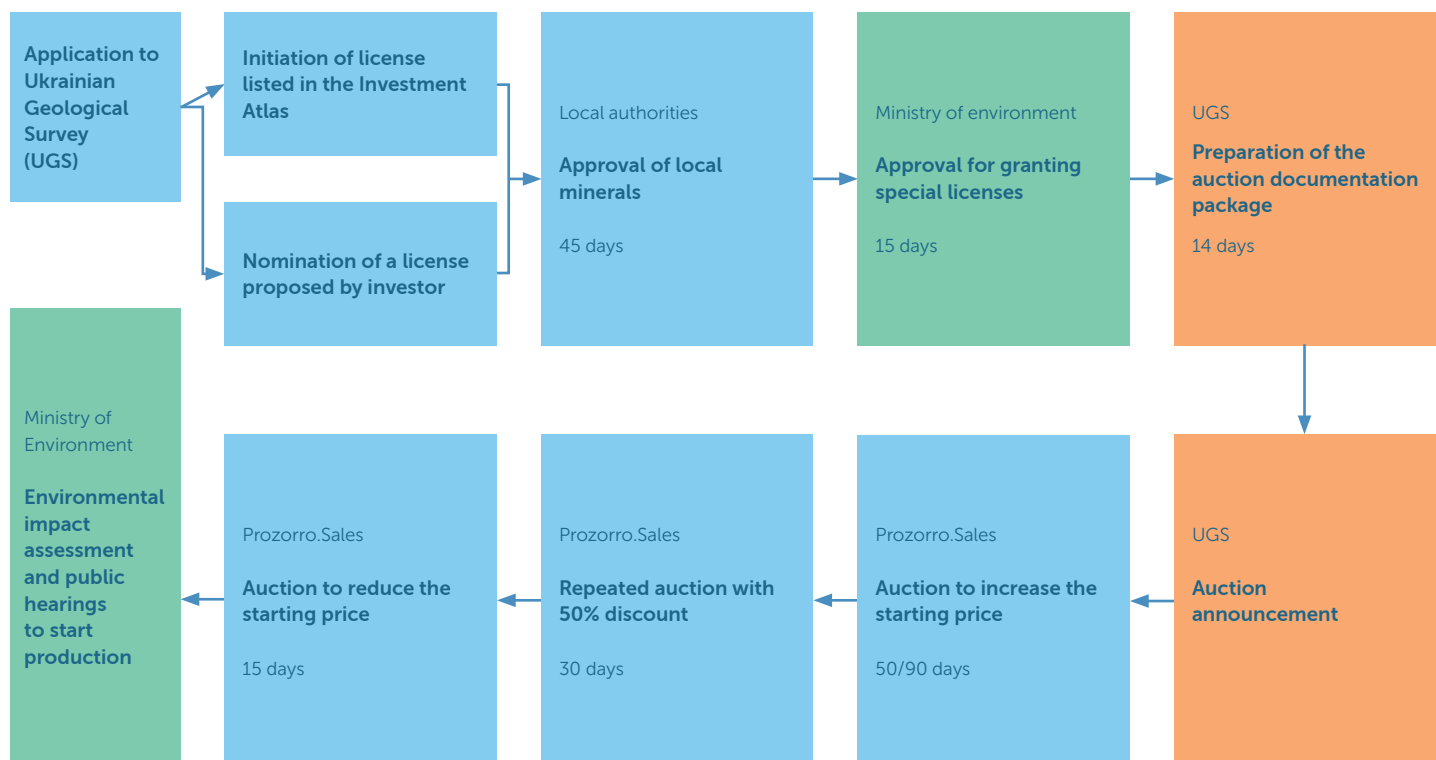
Notably that Ukrainian law does not allow a license holder to transfer a subsoil license to another entity (except for transfer to affiliates in a quite limited cases). That is why the so-called farm-in / farm-out agreements are not yet operational in Ukraine. However, Ukrainian Parliament is working on a draft law No. 4187 dated 5 October 2020, which should enable such instruments.



## AUCTIONS FOR THE SALE OF LICENSE

Licenses may be purchased at online auctions of the Ukrainian Geological Survey. Starting from December 2019, licensing auctions are held online via the electronic platform Prozorro.

### OBTAINING A SPECIAL PERMIT (LICENSE) THROUGH E-AUCTION



#### Winner:

1. Signs the protocol of auction.
2. Pays a fee to the exchange operator.
3. Concludes a contract of purchase and sale of a special license.
4. An agreement on compensation of state expenses for exploration works is concluded.
5. Pays the fee to the state budget.
6. Concludes an agreement on terms and conditions of subsoil use.
7. Receives a license.

Source: Ukrainian Geological Survey.

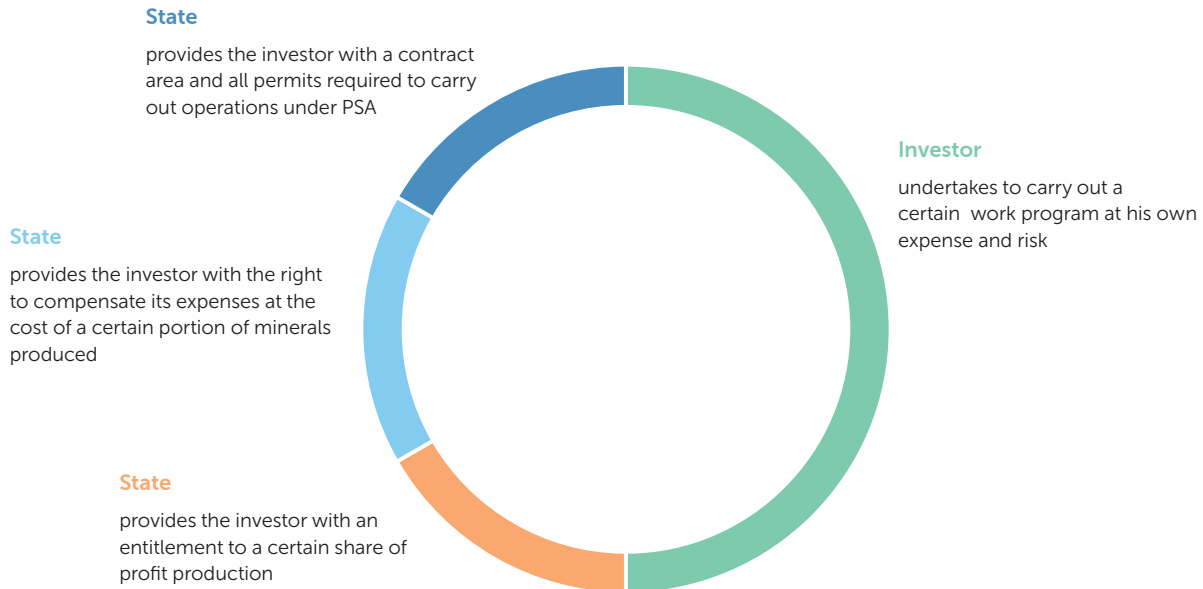
## PURCHASING OF A LICENSE HOLDER

Alternatively, a foreign investor can acquire a Ukrainian company that already holds a license via a traditional M&A. In this case, an agreement for the sale and purchase of shares or participatory interest (SPA) may be governed by English law or law of other favorable jurisdiction.

The parties to an M&A transaction must always check thresholds established by Ukrainian antitrust legislation. Exceeding such thresholds triggers the requirement to obtain an approval of Ukrainian antitrust authority.

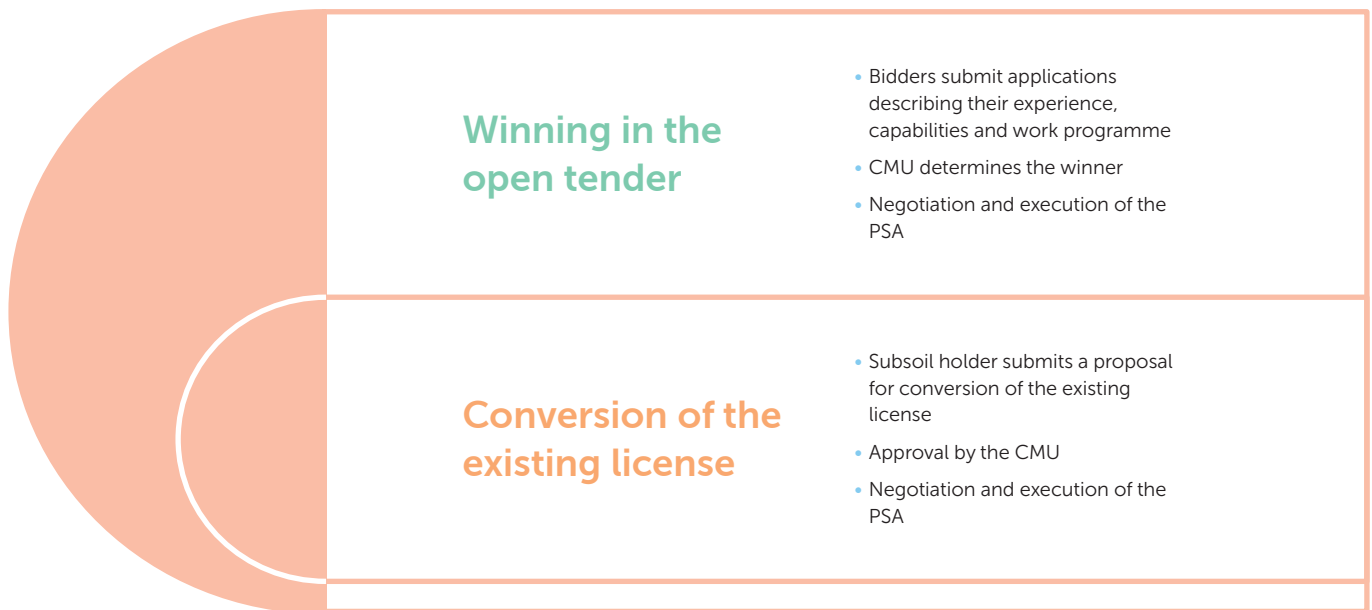
## PRODUCTION SHARING AGREEMENTS

Production sharing agreements (PSAs) are usually concluded in respect of large and poorly explored or complicated subsoil areas between the investor and the Cabinet of Ministers of Ukraine representing the State.



Source: CMS.

### GROUNDS FOR EXECUTION OF PSA



Source: CMS.

#### The PSA has more advantages than the usual licensing regime:

1. Legislative stability, freezing legislation at the time of signing the PSA and protecting the investor from any disruptive changes (including any fiscal and tax or legal changes, but excluding legislation on national security and defence, environmental protection, public order);
2. The state must assist in obtaining permits and approvals required for PSA operations;
3. Settlement of disputes in international arbitration;
4. Special conditions and exemptions from restrictions on foreign currency transfers and customs operations, including export of products;
5. For tax purposes, the investor's profit is determined by the value of the profitable share of product, accounted for the investor under the PSA. All other types of income received by the investor during the PSA are not subject to corporate income tax;
6. Services received by a foreign investor from non-residents in Ukraine are not subject to VAT;
7. Reduced royalty tax rates;
8. The term of the agreement can be up to 50 years (compared to the usual 20 years onshore, 30 years – on the shelf).



## CORPORATE JOINT VENTURES

Any investor can establish an incorporated joint venture (JV) through:

- acquisition of a share (or interest) in a Ukrainian company that already holds a license, or participates in the oil and gas projects using other instruments (PSA, PEC, JAA, etc.);
- or
- incorporation of a new company under the laws of Ukraine with shared charter capital for the purpose of obtaining a license via auctions or through a PSA tender.

The parties should check if they require a merger approval from the Ukrainian antitrust authority for establishing a JV.

## UNINCORPORATED JOINT VENTURES (JOINT ACTIVITY AGREEMENTS)

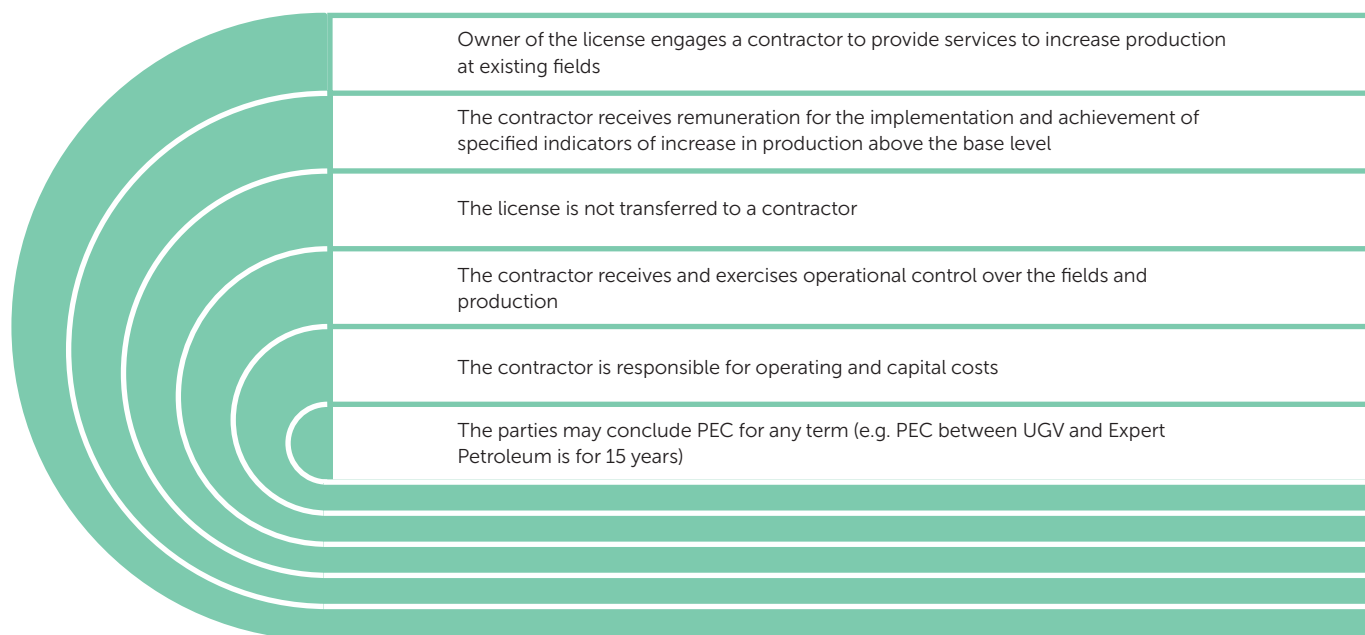
Investor can participate in an unincorporated joint activity with the license holder by executing a Joint Activity Agreement (JAA). The JAA parties agree the amount of their contributions to the joint activity, commitments, shares in profits and expenses. At the same time, the subsoil license cannot be contributed to the joint activity and must remain with its original holder.

JAA's may be used for conducting exploratory activities. However, at present, a JAA is a less favorable option for production, as it lacks stability and proper regulation under Ukrainian law and subject to very high royalty fees (70%).



## PRODUCTION ENHANCEMENT CONTRACT

### THE PRODUCTION ENHANCEMENT CONTRACT (PEC) IS A NEW TOOL FOR THE UKRAINIAN MARKET



Source: CMS.

### COMPARISON OF PSA, PEC, JV AND JAA

	Production sharing agreement (PSA)	Production Enhancement Contract (PEC)	Join venture (JV)	Join Activity Agreement (JAA)
<b>General</b>	2-Party (or more) contract between the investors and the State; investors commit to execute the work program and perform minimum spend obligations	2-Party partnership between license holder and contractor; contractor is selected as a result of tender procedure	Sale and purchase agreement and shareholders agreement	2-Party agreement between license holder and investor without incorporation of a separate entity
<b>Duration</b>	50 years	15+ years	Duration of the license	Duration of the license
<b>Title to the licence</b>	License is issued to all investors under PSA for the whole term of the PSA (covers all stages of the project)	License remains with the license holder; contractor has access to operate all available infrastructure on the field	Special license remains with the JV	Special license remains with the license holder
<b>Title to the reserves and production</b>	Investors can book their share of reserves and get the title to their share of production	Remain with the license holder	Remain with the JV	Remain with the license holder
<b>Operational control</b>	Stays with the Operator (agreed by the Parties); Joint Operatorship Agreement (JOA) has to be signed between the investors	Contractor has operational control; license holder approves key decisions (e.g. WP&B, Key CAPEX items) via Management Committee	JV has operational control	License holder has operational control
<b>CAPEX / Financing</b>	Shared between license holder and investor, depending on participation share / other commercial agreements (carry etc.)	100 % financed by the contractor	100 % financed by the JV; investors share them depending on participation share or other arrangements	Shared between license holder and investor, depending on JAA
<b>Compensation mechanism</b>	Up to 70 % of production offsets against Investors' recoverable expenses, up to 89% of remaining 30% - investor's profit share	Service fee: 2-stage \$/thousand cm tariff (baseline and incremental); incremental is much higher than baseline	Not applicable	Not applicable
<b>Taxation</b>	Fixed tax regime for the whole PSA term. Income tax – 18%, dividend repatriation tax – 15%, royalty for the production of liquids – 2 %, natural gas – 1.25%	Income tax – 18%, Dividend repatriation tax – 15%	Income tax – 18%, Dividend repatriation tax – 15% Applicable royalties	Income tax – 18%, Dividend repatriation tax – 15% Royalties – 70%

Source: CMS.

## FOREIGN INVESTMENT PROTECTION REGIME

Foreign investors in Ukraine generally enjoy the same rights as domestic ones, with some exceptions.

Foreign investment can be performed in any form not prohibited by law, including:

1. JVs with Ukrainian partners;
2. purchase of shares or stakes in an existing Ukrainian company;
3. creation of Ukrainian legal entities, representative offices or branches;
4. purchase of movable and immovable property or property rights.

Foreign investments can be performed in UAH or in any foreign currency that can be converted by the National Bank of Ukraine.

### GUARANTEES FOR FOREIGN INVESTORS IN UKRAINE

#### Protection against changes in legislation

Foreign investors are protected from changes to Ukrainian legislation on foreign investment for a period of 10 years from implementation of the respective changes at the request of the investor. This guarantee does not apply to matters of national security, environmental protection or other matters.

#### Protection against expropriation

Foreign investments may not be nationalized or expropriated by the state, except in cases of emergency measures approved by the Government.

#### Compensation and reimbursement of damages

Foreign investors have the right to compensation for losses, including lost profits and non-pecuniary damage caused by actions, omissions or other improper actions performed by public authorities of Ukraine in relation to a foreign investor or enterprise with foreign investment. Losses shall be reimbursed in the currency of the investment (or in another currency that is acceptable to the investor).

#### Return of discontinued investments

Within six months of the termination of the investment activity, the foreign investor has the right to recover his investment either in kind or in the currency of the investment (in the amount actually paid and without custom duties) and monetary or commodity form, taking the market value at the time of termination of investment activities into account.

#### Repatriation of profits

Taking the rules of monetary control of the National Bank of Ukraine into account and after covering all due taxes and fees, foreign investors are guaranteed with unobstructed and immediate transfer abroad of income and revenue from investment activities in Ukraine and of other funds in foreign currency.

#### Treaties concerning investment protection and dispute resolution institutions

In accordance with the legislation of Ukraine, investment disputes between foreign investors and the state are resolved in the courts of Ukraine, unless the treaty on investment protection otherwise provides. Ukraine is a signatory to 67 bilateral and 3 multilateral and most investment protection treaties signed by Ukraine provide for one or more institutions where an international investor can seek arbitration to resolve an investment dispute with the state of Ukraine.

Source: CMS.



## ROYALTIES

License holders pay royalty for the amount of extracted minerals. The royalty rate, subject to defrayal is calculated based on the value of the mineral produced and on the royalty rate set forth in the Tax Code for each respective mineral.

In some cases provided for in the Tax Code, such as production of minerals exceeding permitted volumes or in specified fields, such as the continental shelf, a correction factor (0.01 – 2.00) is applied.

### LICENSES DIFFER BY TYPE OF ACTIVITY, AS DESCRIBED BELOW

Mineral	Royalty rate
Oil*	31% of deposits that lie at a depth of up to 5 000 meters 16% of deposits that lie at a depth of more than 5 000 meters
Natural gas*	11% for gas extracted from deposits in fields within the continental shelf and / or the exclusive (marine) economic zone of Ukraine 14% for gas produced from deposits at a depth of more than 5 000 meters 29% for gas produced from deposits at a depth of up to 5 000 meters 70% for gas produced during the implementation of joint venture agreements
Natural gas extracted from wells drilled after 1 January, 2018	6% for wells with a depth of more than 5 000 meters 12% for wells with a depth of up to 5 000 meters The stabilization condition provides that these rates for new wells will remain effective until 2023
Other minerals	5%

Note: \*PSA investors pay 2% for oil and condensate and 1.25% for natural gas (including associated, shale, tight gas, coalbed methane, etc.)  
Source: CMS.





## GENERAL TAXES IN UKRAINE

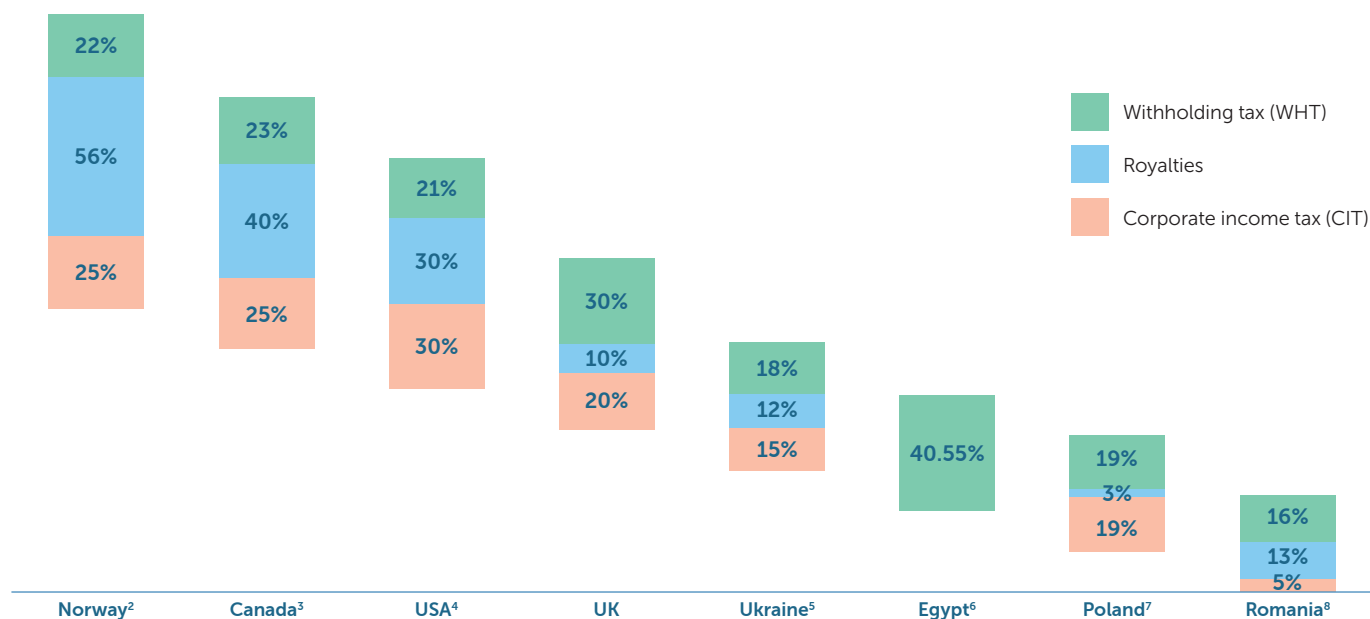
Tax type	Tax rate	Tax base
Corporate Income tax <sup>1</sup>	18%	Financial result adjusted by limited tax differences
Withholding tax	15% <sup>2</sup>	Ukrainian-sourced income earned by foreign company, except for proceeds from sale of services/goods to Ukrainian counterparties As of 1 January 2021, deviation of price in related-party transactions is regarded as payment of deemed dividends and is subject to withholding tax
Value added tax (VAT) <sup>3</sup>	20% (general rate), 0% for export	Value of goods/services imported or supplied
Land Tax	Rates vary depending on type of land and municipality	Normative monetary valuation of the land (if conducted) or the total land area
Personal income tax (PIT)	18%, 5% on dividends from Ukrainian companies, 9% on dividends from non-resident companies	Gross salary or other income; amount of tax to be withheld and reported by employer
Military tax	1.5% in addition to personal income tax on all income	
Single social security tax: employer	22%	Gross wages up to the amount of 15 minimum wages (in 2021: UAH 90 000 or EUR 2 700)
Single social security tax: employee	Does not apply	NA
Minimum wage (full time)	UAH 6 000 or EUR 180 per month in 2021	For full time employment

Note: 1) Losses Carry-Forward: allowed without limitation. Thin Capitalisation Rules: applied in qualified cases, interest is deductible within 30% of the EBITDA.

2) may be reduced by applicable double tax treaty 3) Specialized rates apply for pharmaceuticals and agro products.

Source: CMS.

## GOVERNMENT TAKE FOR NEW INVESTMENTS IN UKRAINE AND IN OTHER COUNTRIES <sup>1</sup>



Note: 1) Based on the highest value of direct taxes and duties for each country; 2) Royalty for offshore extracting activities; 3) Rates differ depending on the type of land production is performed (crown, state or private) and depending on state (information provided in relation to Alberta); 4) + Severance tax payable to the US state where the product is extracted;

5) Provided for gas wells with a depth of up to 5 000 meters (not taking into account 70% royalty for gas produced during the implementation of joint activity agreements); 6) Taxation regime may be different depending on the license agreement; 7) + exploitation fee: • for high-methane natural gas – PLN 26.54 per 1 000 cm, if semi-annual production by the company is more than 2.5 million cm, or PLN 6.91 per 1 000 cm, if semi-annual production by the company is less than 2.5 million; • for low-methane natural gas – PLN 22.12 per 1 000 cm, if semi-annual production by the company is more than 2.5 million cm, or zero, if semi-annual production by the company is less than 2.5 million cm; 8) + between 15% to 70% tax applying to the additional income obtained from the sale of natural gas extracted from offshore perimeters, after deducting the investments in the upstream segment for offshore gas production.

Source: CMS.

## CURRENCY REGULATION

Ukrainian law sets a number of relatively strict foreign currency restrictions that may apply to purchase and transfer of FX abroad.

For instance, in case a Ukrainian corporate entity would like to purchase FX for the sole purpose of transferring such FX funds to its offshore bank account, a Ukrainian residents will not be able to do that unless such Ukrainian corporate entity has an express obligation under a cross-border contract (e.g. an obligation to hold funds on the offshore bank account). As a matter of practice, to effect the FX purchase, banks also analyse if such contractual obligation has an economic rationale.

### GENERAL EXEMPTIONS

At the same time, payments under cross-border loans, export/import operations, and payments under security relating to a transaction are generally exempted from such restrictions.

Foreign currency payments by non-residents to Ukrainian entities from abroad are generally allowed, provided they (including the grounds for such payments and documents evidencing the same) do not contradict the law.

### 365-DAY RULE

With respect to export/import transactions, the so-called 365-days rule applies as follows: (a) where payment by a Ukrainian party is made in advance for the goods (works, services) to be imported to Ukraine, the delivery of those goods to Ukraine must take place within 365 calendar days after the date of payment; and (b) proceeds of a Ukrainian corporate entities and entrepreneurs from an export of goods (other than intellectual property rights and other non-property rights, transport and insurance works and services transactions) should be credited to an account of such resident in a bank within not more than 365 days after customs clearance of exported goods or evidence on completion of the works or services. Failure to comply with these rules will result in substantial fines on the Ukrainian party.



## LABOUR RELATIONS

Under Ukrainian law, employees are hired either under an employment agreement or an employment contract. The employment contract allows more contractual freedom but can only be signed with certain categories of employees, such as with a company director or a foreign employee.

### COMPENSATION

Employees are entitled to compensation for the work they perform, including monthly salary, bonuses and other compensations (for business trips, sick leaves, holidays and etc.). Salaries are paid only in the Ukrainian Hryvnia (UAH), although an employment agreement may set the value of the salary in a foreign currency (e.g., EUR or USD).

### WORK AND REST

Generally, the maximum work week is 40 hours excluding lunch breaks. All employees are entitled to a minimum of 24 calendar days of paid annual leave after working for an employer for six continuous months.

### HEALTH AND SAFETY

The employer must provide a safe work environment for its employees and ensure that workplaces and sanitary conditions fully comply with the requirements of Ukrainian law. Special requirements, including special clothing and protective equipment, additional rest breaks, and regular medical checks, apply to employees whose work involves exposure to dangerous or hazardous conditions (such as in oil and gas sector).

### FOREIGNERS

For a foreigner to work in Ukraine as an employee of a Ukrainian legal entity, a number of formalities need to be fulfilled:

- the employer needs to obtain a permit to employ a foreigner (work permit) which is issued for 1 to 3 years for certain categories of foreign employees including: (a) founders, participants, or beneficial owners of Ukrainian companies; (b) highly paid professionals with a salary of more than UAH 236 150 per month (approx. EUR 9 000); (c) IT specialists; (d) secondees; and (e) graduates of the top 100 world universities;
- on obtaining a work permit, a foreign employee may also need to obtain a long-term visa (type D visa) and a temporary residency permit to be able to stay in Ukraine freely; and
- the foreigner needs to obtain the employer's registration number from the State Register of Individual Taxpayers in order to receive its salary.





## LITIGATION AND DISPUTE RESOLUTION

Litigation is the usual mechanism for resolving civil and commercial disputes, as well as conflicts with state and municipal bodies.

### THE GENERAL JUDICIAL SYSTEM OF UKRAINE MADE UP OF:

Supreme Court Grand Chamber of the Supreme Court					
Criminal Court of Cassation	Civil Court of Cassation	Administrative Court of Cassation	Commercial Court of Cassation		III instance
Appellate courts (courts of the AR Crimea, regional courts, courts of cities of Kyiv and Sevastopol)		Appellate administrative courts (appellate circuit courts)	Appellate commercial courts (appellate circuit courts)		II instance
High Anti-corruption Court	Local general courts (circuit courts)	Local administrative courts (circuit courts)	Local commercial courts (circuit courts)	High Court on Intellectual Property	I instance

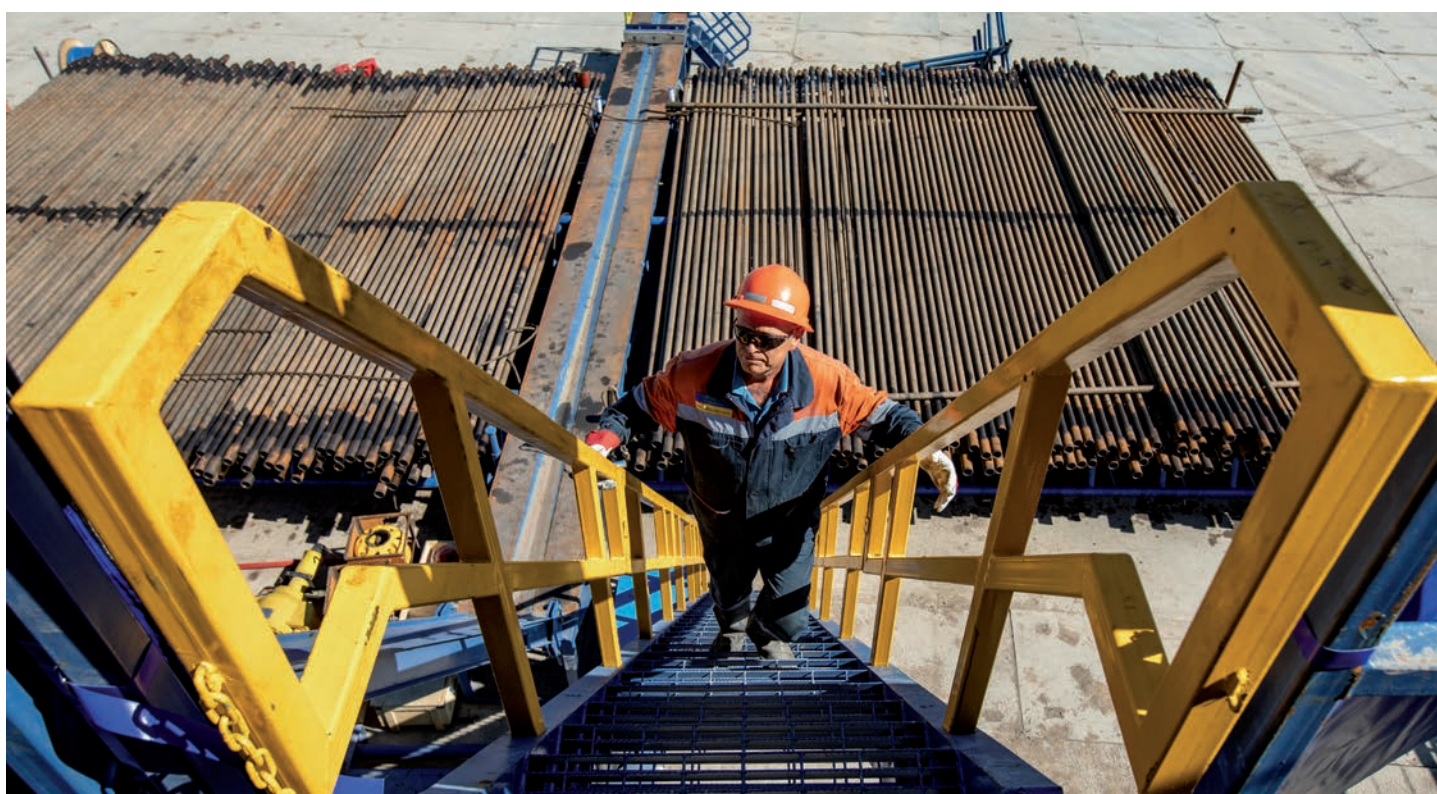
Source: CMS.

In Ukraine the rules governing court procedures and practices are part of Ukraine's procedural law.

Since 2019 only licensed advocates have been allowed to represent clients before courts of all levels, except for a limited list of minor cases.

In Ukraine, except for limited exceptions that require a state enforcement officer, a creditor may take the judgement of a court to a private enforcement officer for enforcement.

Arbitration and mediation are the main forms of alternative dispute resolution in Ukraine other forms are either non-existent or rarely applied.





**Investment opportunities**

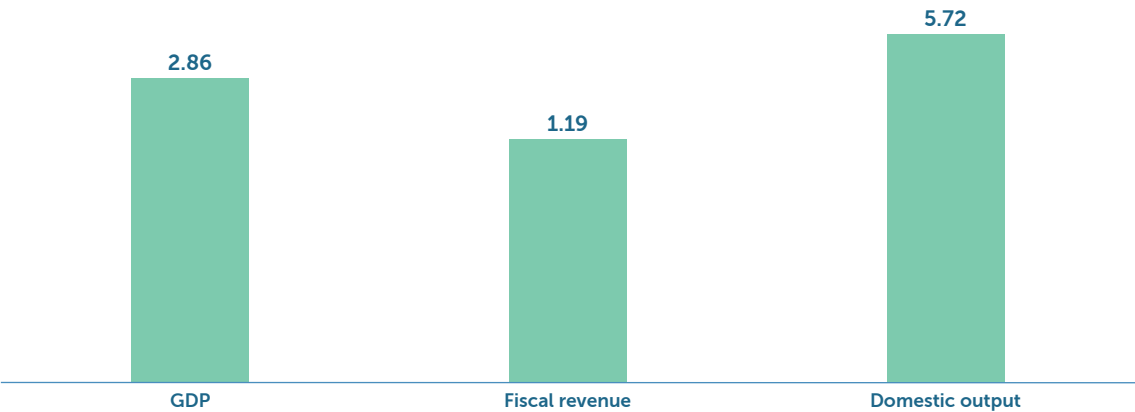
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## DEVELOPMENT STRATEGY

The fulfillment of the National strategy 2030 of self-sufficiency in natural gas assumes domestic trade gas production growth from expected ~19 bcm in 2021 to 30 bcm in 2030. The implementation of this ambitious target would require \$25-30 bln of investment in 2021-2030. This amount is well beyond the means of Naftogaz and other Ukrainian private oil and gas companies' means. Therefore, the foreign direct investments in the industry are required.

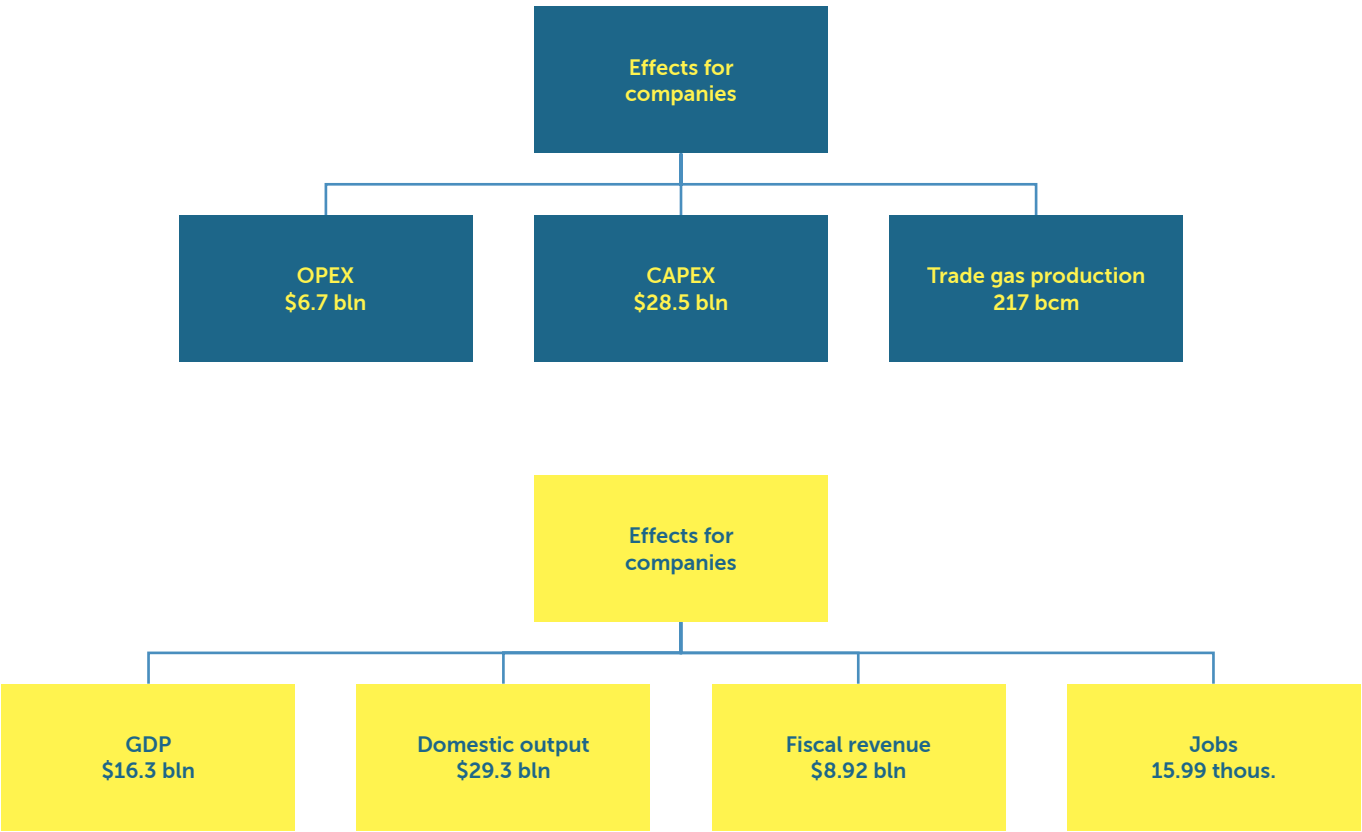
Investment in the gas industry will yield in significant benefits for the country, as stipulated in the Impact Assessment Study by KPMG (2021). Therefore, Ukrainian government will support foreign investment in the industry, either directly or in partnership with Naftogaz or private producers.

### LONG-TERM EFFECTS OF 1\$ INVESTMENTS IN NATURAL GAS PRODUCTION FIELDS



Note: Investment multiples analysis assumes investment into a typical conventional natural gas well with initial CAPEX outlay in its first two years and a declining natural gas rate of yield over the 20 years of exploitation, based on Naftogaz's data. Source: Naftogaz Group.

### DEVELOPMENT STRATEGY LEADS TO ENERGY INDEPENDENCE

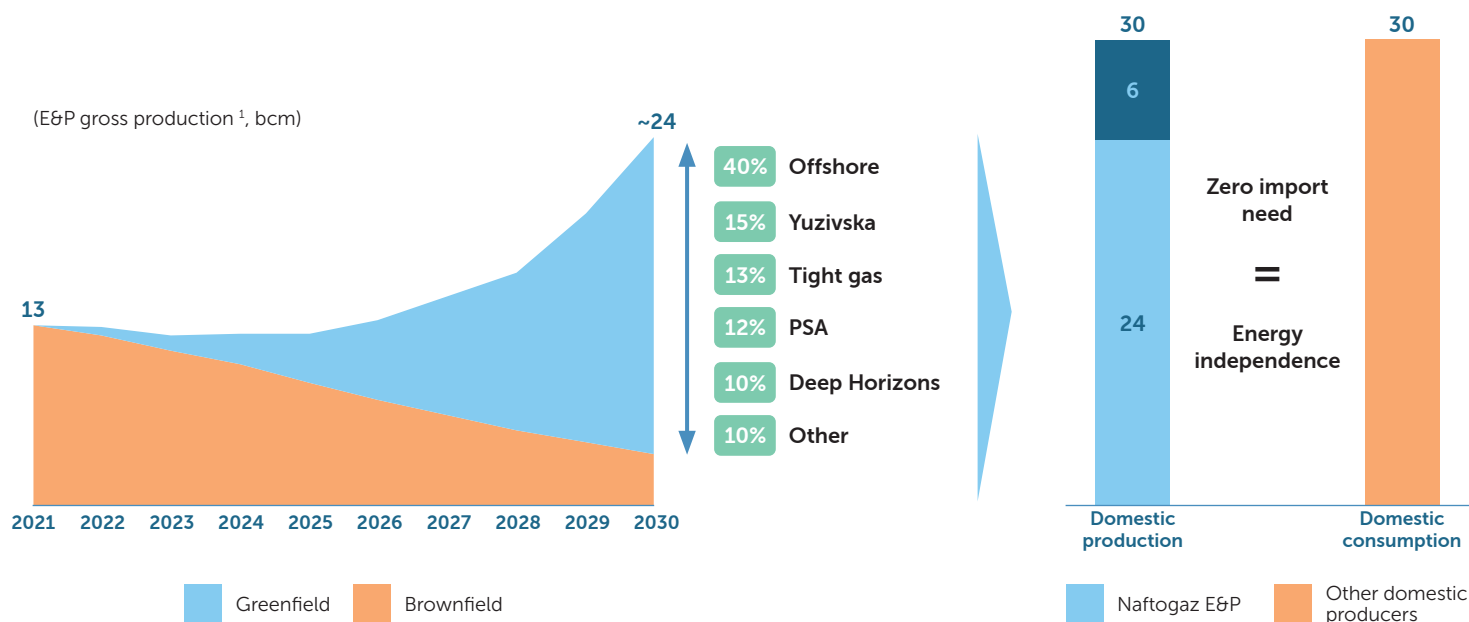


Note: Cumulatively in 2021 – 2030, the effects of the Development Strategy are the sum of the effects of the newly balanced economy per year. Source: Naftogaz Group.

## NAFTOGAZ PROJECTS

In the late end of 2020 – early of 2021 Naftogaz obtained several strategic assets for exploration and development. These assets are the core of Naftogaz's new exploration and production strategy, aimed at driving production growth that will allow Ukraine achieve energy independence within 10 years.

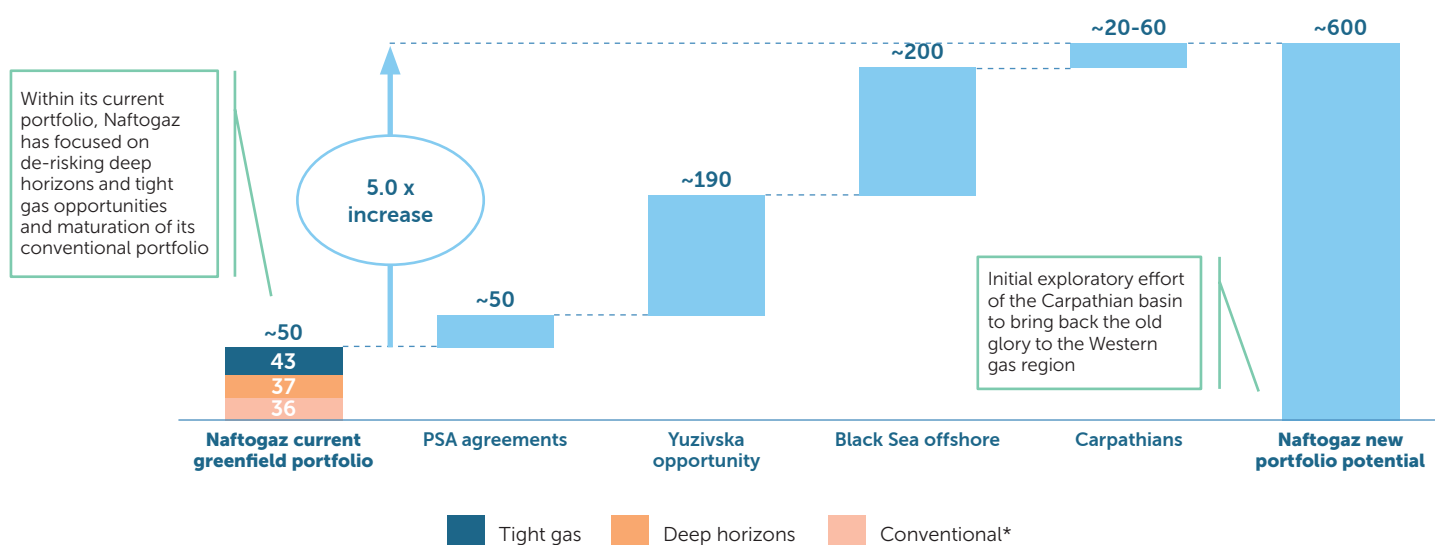
### EXPLORATION SUCCESS OF NEW GROWTH OPPORTUNITIES WILL MEAN UNLOCKING OF NATURAL GAS PRODUCTION



Note: \*In case of strategic initiatives exploration success & represented by full production potential (incl. government share in PSA contracts).  
Source: Naftogaz Group.

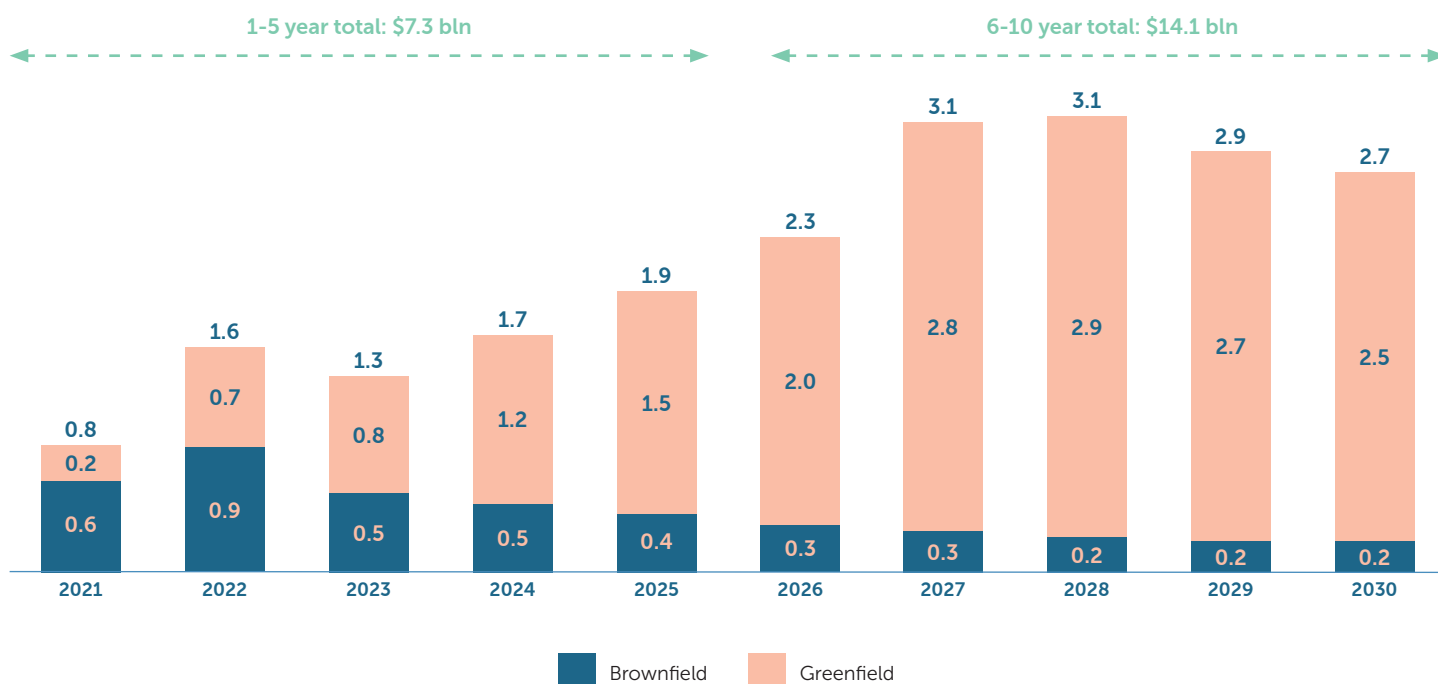
### IN 2020, NAFTOGAZ WITH SUPPORT FROM THE GOVERNMENT HAS SIGNIFICANTLY GROWN ITS GREENFIELDS PORTFOLIO

Production potential in case of exploration success - estimated ultimate recovery (EUR), bcm



Note: Expected ultimate recovery is estimated at P50 probability level  
\*for Conventional Greenfield only licenses with positive economics (EMV based) were included.  
Source: Naftogaz Group.

## IMPLEMENTATION OF NAFTOGAZ'S E&amp;P STRATEGY WILL REQUIRE \$ 20-25 BLN INVESTMENT IN THE COMING 10 YEARS



Note: Estimated investments presented on a stand-alone basis (exploration & development without a partner).  
Source: Naftogaz Group.

Naftogaz considers partnerships across the entire its portfolio of assets, both production and exploration. Depending on the opportunity, in addition to capital, Naftogaz is looking for certain technological expertise, operational efficiency improvement (brownfields additional development), and political support (offshore project). In terms of entry ticket, different opportunities have different investment requirements, ranging from \$20 mln (e.g. exploration programme commitment for a single greenfield license or PSA block) to \$300 mln (offshore exploration programme). However, given the significant amount of overall investment required across all the projects, Naftogaz is looking for strategic partnerships starting at a \$100 million commitment. Forms of partnership can vary within current legislation. Thus, entering into a Production Sharing Agreement is currently the most likely way to partner with Naftogaz for exploration blocks. For new opportunities, not currently in Naftogaz portfolio, like the Carpathian project, or the acquisition of new blocks through auctions or PSA tenders, a Joint Venture between a partner and Naftogaz can be established for joint bidding. Finally, brownfields additional development, can be done through Production Enhancement Contract. Should current legislation change (e.g. draft law № 4187) new partnership mechanisms may become available.

The significant part of the Naftogaz Groups strategy is to attract experienced international partners for joint investment and

efficient and rapid development of sites.

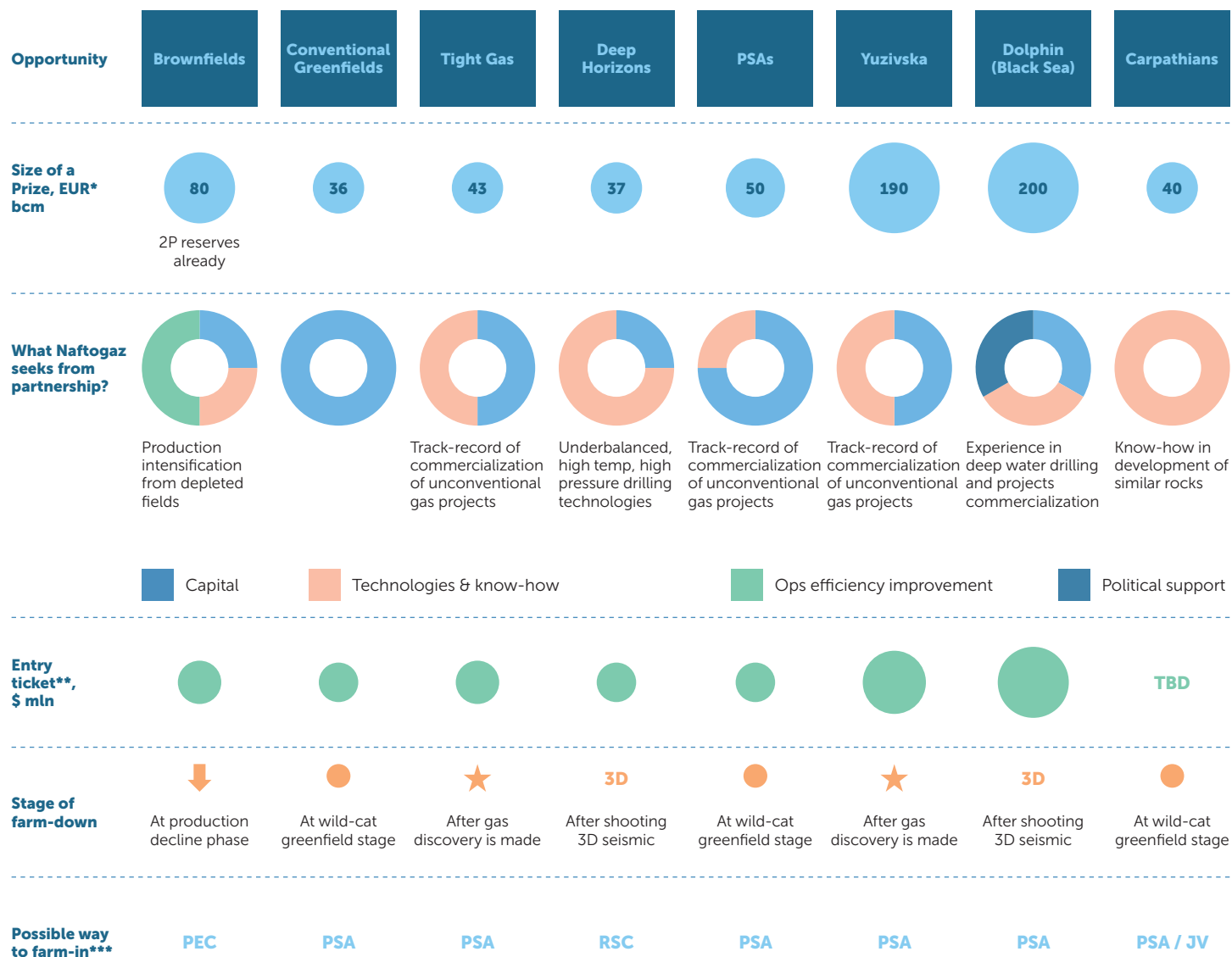
In February 2021, Naftogaz Group signed a memorandum of understanding on cooperation with the leading integrated energy company of Southeast Europe, Romania's OMV Petrom. Naftogaz and OMV Petrom aim to implement joint gas exploration and production projects in Ukraine. Especially valuable is the experience of OMV Petrom on the Black Sea shelf: the company has discovered the promising Neptune field, has expertise and technology in offshore drilling, and has proven experience of successful and efficient development of onshore sites.

In March 2021, Naftogaz Group and the Israeli company Naphtha Israel Petroleum signed a memorandum of understanding on the potential geological exploration of hydrocarbons in the Ukrainian part of the Black Sea. Naphtha Israel Petroleum has financial opportunities and proved positive experiences in the United States and on the Israeli shelf (in the eastern Mediterranean), which may be useful in unlocking the oil and gas potential of the Ukrainian shelf.

In March 2021, Naftogaz Group and Polish oil and gas company PGNiG signed memorandum of understanding. The partners jointly aim to combine their experience and resources in developing several of projects, first of all in Western Ukraine on the border with Poland.

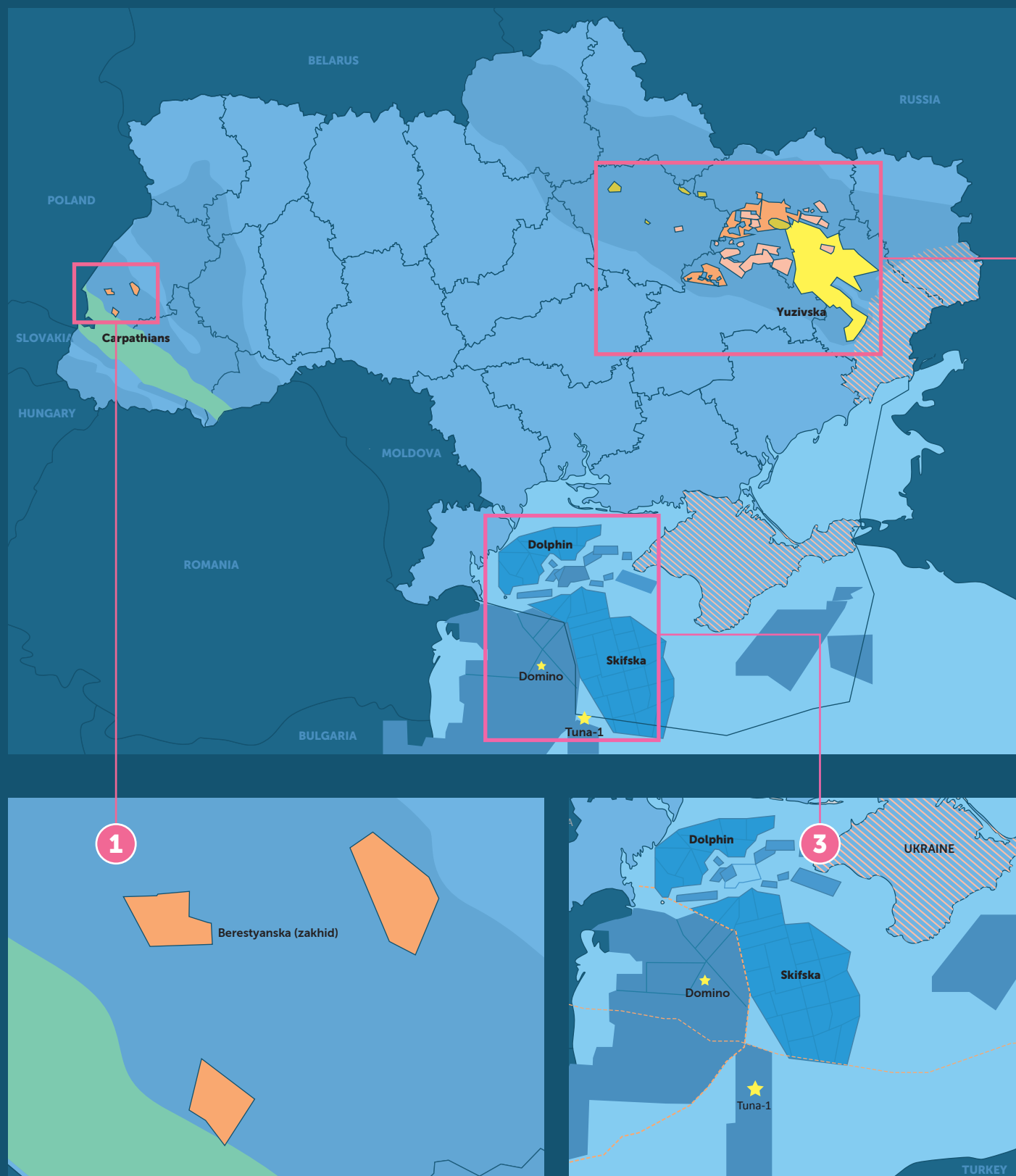


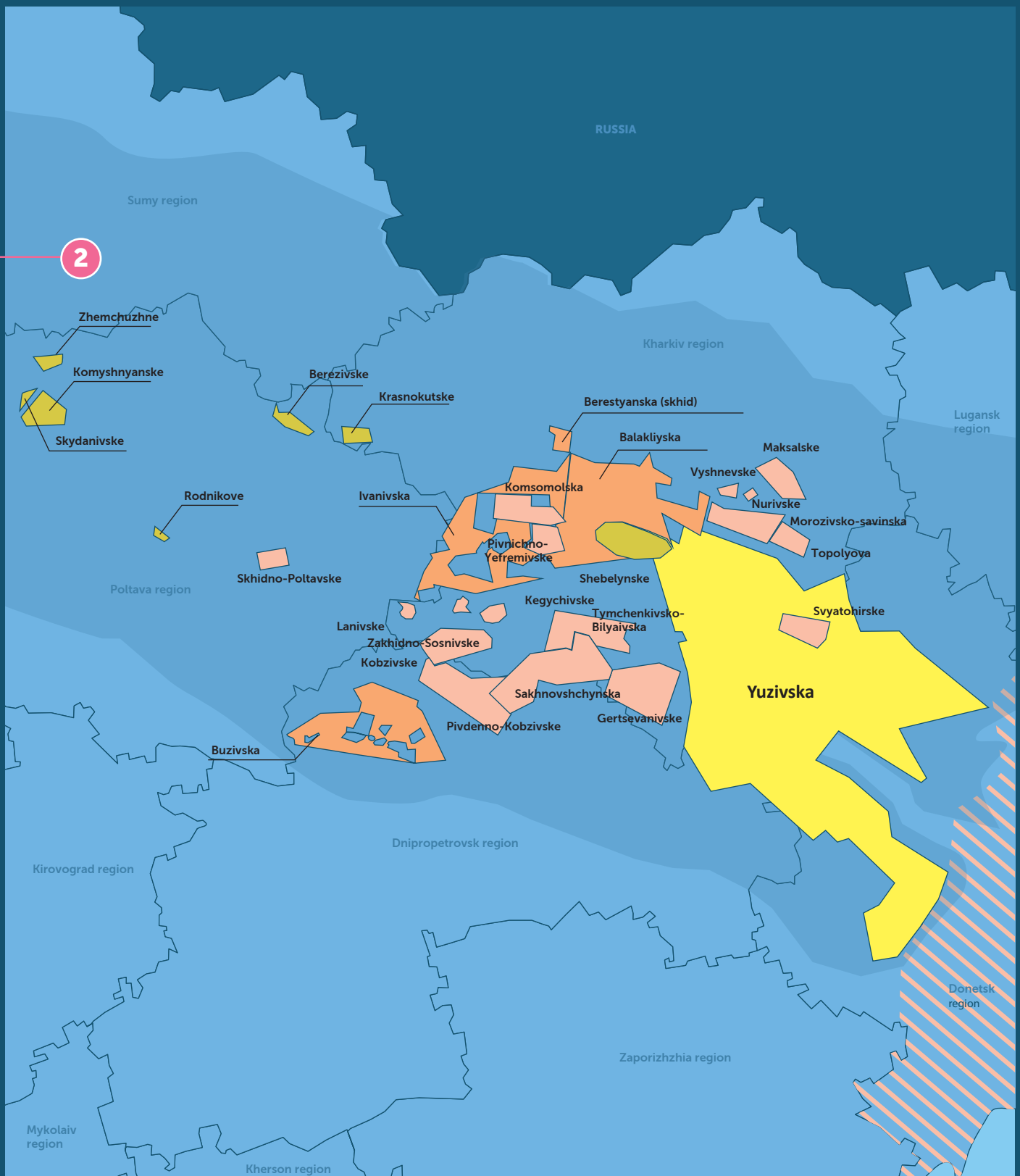
## STRATEGIC PARTNERSHIP OPPORTUNITIES IN E&amp;P



Notes: \* EUR – expected ultimate recovery; \*\* - Minimum size of a project in each bucket; Naftogaz will only consider partnerships with overall minimum investment commitment of \$100+ mln; package deal with projects from different buckets is possible; \*\*\* - Production Enhancement Contract (PEC), Risk Service Contract (RSC), Production Sharing Agreement (PSA); Joint Venture (JV).  
Source: Naftogaz Group.

## MAP OF NAFTOGAZ GROUP PROJECTS







## DOLPHIN PROJECT (BLACK SEA OFFSHORE)

### Executive summary

In end of 2020 Cabinet of ministers of Ukraine issued a resolution to grant Naftogaz exclusive rights for exploration, appraisal and development in North-Western part of the Black Sea, with close proximity to major gas discoveries.

Naftogaz has applied for 36 licenses (blocks) in the area which is not controlled by Russian Federation with the total acreage of ~30 000 sq.km and expects to receive the special permits with 30 years duration in Q1 2021.

The license are has 4 type plays, including shallow water (<150 m WD), slope (<1000 m WD), and deep water (<2000 m WD) with total GIIP estimated at 1.6 tcm and EUR of ~200 bcm, with majority of it concentrated in deep water, which has similar geology to Romanian and Turkish discovery plays.

Once the special permits are granted Naftogaz plans to de-risk the are by shooting up to 20 000 sq.km of new 3D seismic, and reinterpretation of available 2D seismic (mostly within shallow and slope areas).

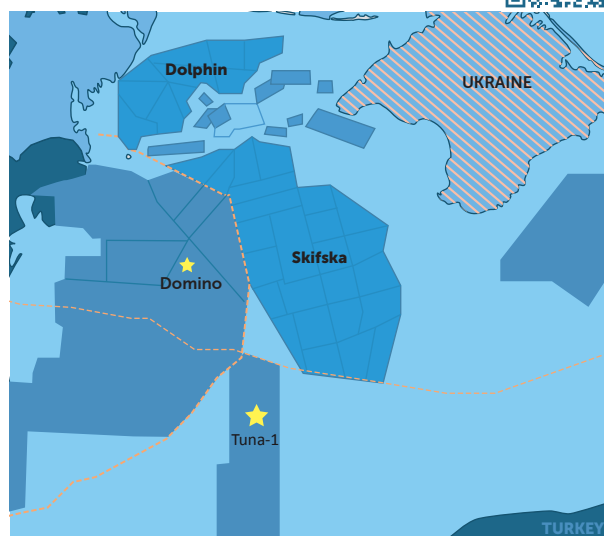
In January 2021, the Supervisory Board of NJSC Naftogaz of Ukraine reviewed and approved the strategy of the Naftogaz Group until 2025, in particular the strategy and business plan of the Exploration and Production division, paving the way for the implementation of strategic initiatives.

### Key next steps

1. Spud first exploration well (-s)	Q1 2023
2. Announce first commercial discovery	Q4 2023
3. Start pipeline construction	2024
4. Start production	2026

**Total production 44.0 bcm**

**Total investment schedule \$10 758 mln**



**Regions:** Odessa

**Depth:** Shallow: <150 m, Slope: <1 000 m,

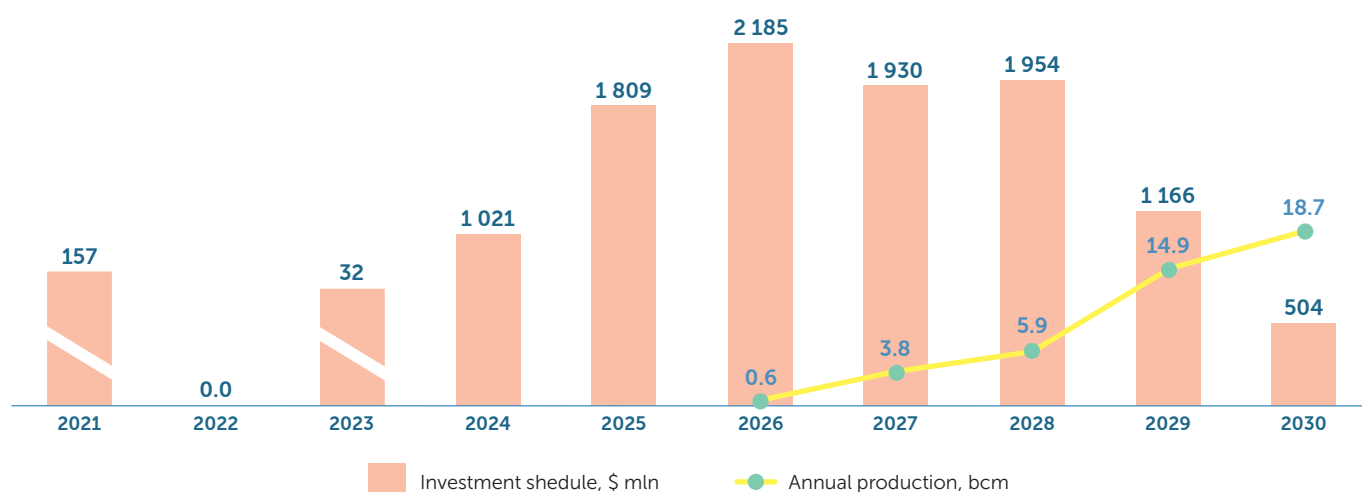
**Deep water:** <2 000 m

**Type of deposits:** conventional collectors

**EUR (P50)\*:** ~ 200 bcm

\* EUR - estimated ultimate recovery assessed with probability 50% (P50)

Parameter	Value
Stage	Exploration
License duration	30 years
Acreage, sq.km	~29 000
Gas type	Conventional, both shallow and deep water
Probability of success, %	within 20% to 30% range for different blocks
Year of first production	2026
Peak annual production, bcm	2031
Total number of wells to be drilled	117
Planned 3D seismic, sq.km	20 000
Total CAPEX, \$ mln	10 775





## YUZIVSKA PROJECT

### Executive summary

In Dec 2020 Naftogaz acquired 100% corporate rights of Nadra Yuzivska, the sole (100%) holder / beneficiary of Yuzivska PSA (valid until 2064).

Yuzivska PSA was signed in 2013 between Shell, Nadra Yuzivska and the State of Ukraine. Shell exited PSA in 2015 due to force majeure (Ukraine's military conflict with Russia over Crimea and part of Eastern Ukraine).

Yuzivska is the largest onshore block in Ukraine (7 800 sq.km) and is located in known oil&gas region (DDB) with close proximity to largest producing gas fields in Eastern Europe.

Yuzivska has both conventional and unconventional (tight gas, Basin Central Gas) potential with lots of 2D and 3D data available for immediate E&A drilling.

According to PSA, Naftogaz has certain spend and work obligations over the next 5 years, which are anyways lower than its envisioned WP&B for this period.

### Key next steps

1. Start re-entering existing (old) wells within the block	Q3 2021
2. Start drilling new E&A wells to test leads	Q4 2021
3. Start shooting new 2D / 3D seismic in Northern part	Q2 2022



**Regions:** Donetsk, Kharkiv

**Depth:** 4-6 km

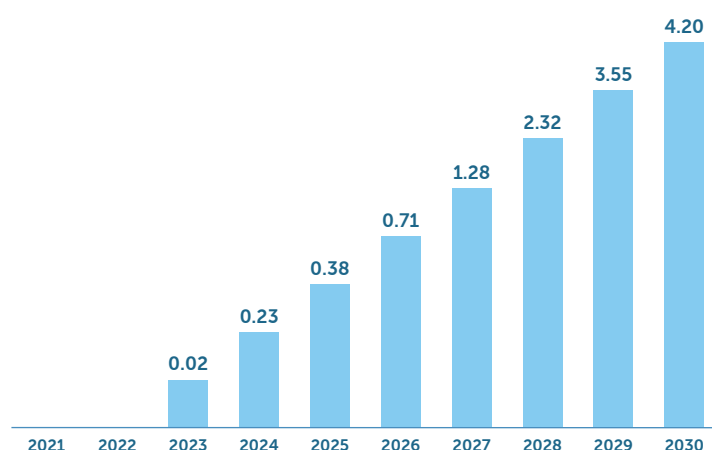
**Type of deposits:** conventional and unconventional collectors

**EUR (P50)\*:** ~ 190 bcm

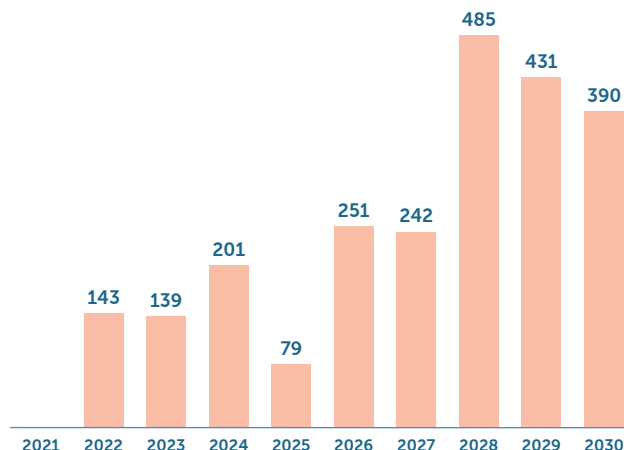
\* EUR - estimated ultimate recovery assessed with probability 50% (P50)

Parameter	Value
License duration	Until 2064
Type of hydrocarbonates	Gas
Probability of success, %	26% for conventional gas 40% for tight gas
Year of first production	2023
Peak annual production, bcm	2030
Commitment CAPEX (PSA), \$ mln	355
Committed № of wells	15
Committed 2D seismic, sq.km	2 500
Total CAPEX, \$ mln	11 320
Total number of wells to be drilled	745

Annual production, bcm  
Total – 12.69



Investment schedule, \$ mln  
Total – 2 359





## PRODUCTION SHARING AGREEMENTS PROJECT

### Executive summary

On 31 December 2020 Naftogaz E&P and State of Ukraine signed 4 PSAs (production sharing agreements) for 4 blocks onshore with the total acreage of ~3 000 sq.km for the purpose of exploration and, in case of commercial discovery, further development of these blocks.

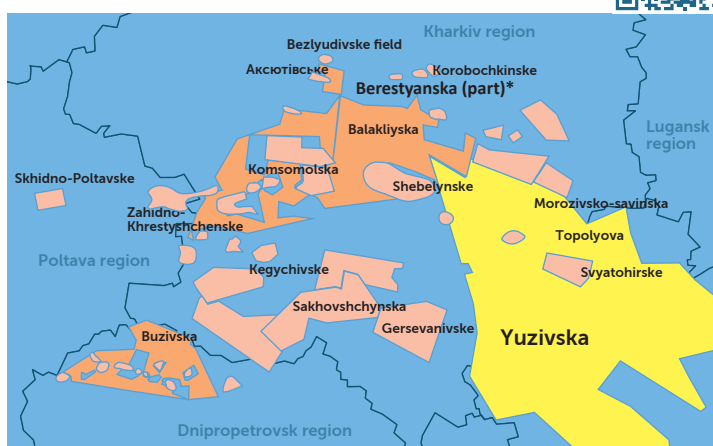
The duration of the PSA is 50 years; the fiscal terms and legal terms are more favorable than for usual concession regimen in Ukraine.

Naftogaz E&P has taken upon commitment to invest ~\$ 120 mln over 5 years in exploration activities, including drilling at least 12 wells and covering at least 1 550 sq.km with 3D seismic.

The blocks are located in proved oil&gas provinces of Ukraine, and Naftogaz evaluates its potential reserves (EUR) at ~50 bcm.

### Key next steps

1. Fulfil PSA condition precedents (PSAs effective)	Q4 2021
2. Start shooting 3D seismic	Q1 2022
3. Spud 1st exploration well	2023
4. First production obtained	2026
5. First reserves booked	2024
6. End of E&A phase; beginning of Production phase	2026



PSA blocks

**Regions:** Poltava, Kharkiv, Lviv, Ivano-Frankivsk

**Depth:** 4-6 km (East)/2.5 km (West)

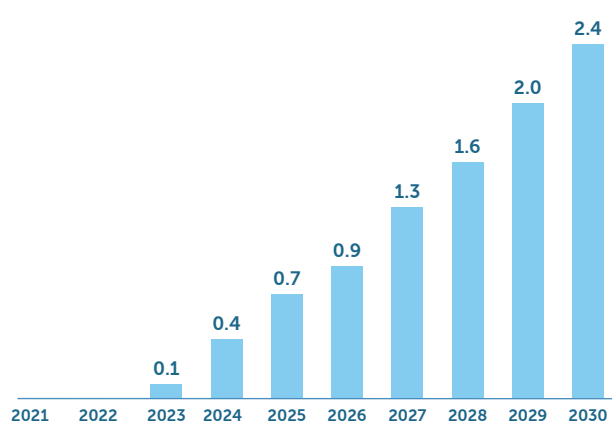
**Type of deposits:** conventional collectors

**EUR (P50)\*:** 50 bcm (natural gas) + 4 m tonnes (oil)

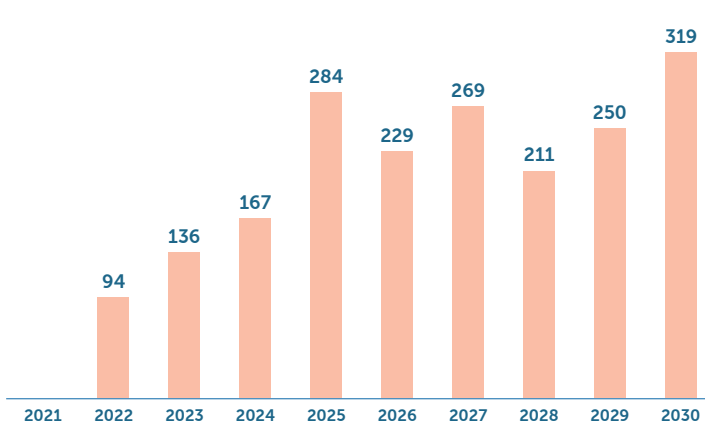
\*EUR - estimated ultimate recovery assessed with probability 50% (P50)

Parameter	Value
License duration	Until 2071
Type of hydrocarbonates	Mostly gas, some oil
Average well depth, meters	4 000 – 6 000 (East) / 2 500 (West)
Probability of success, %	within 15% to 29% range for different blocks
Year of first production	2023
Peak annual production, bcm	4.1
Commitment CAPEX (PSA), \$ mln	120
Committed № of wells	12
Committed 3D seismic, sq.km	1 550
Total CAPEX, \$ mln	2 875
Total number of wells to be drilled	417

Annual production, bcm  
(Total 9.4 bcm)



Investment schedule, \$ mln  
(Total 1 959 mln)





## CONVENTIONAL GREENFIELDS PROJECT

### Executive summary

Naftogaz has 56 conventional (and mostly small) greenfields at different stages of de-risking in its portfolio with total EUR\* (P50) of ~100 bcm. 56 greenfield licenses majority of which have perspective resources at various stages of development with a total area of 10 000 sq.km in its portfolio.

Naftogaz is going to pursue disciplined analysis and prioritization of current conventional greenfield special permits and execute de-risking activities (seismic and E&A drilling) to understand field potential with further expedite field development.

There are multiple blocks for which first well are already spud or can be spud this year already and first production obtained by the end of 2021.

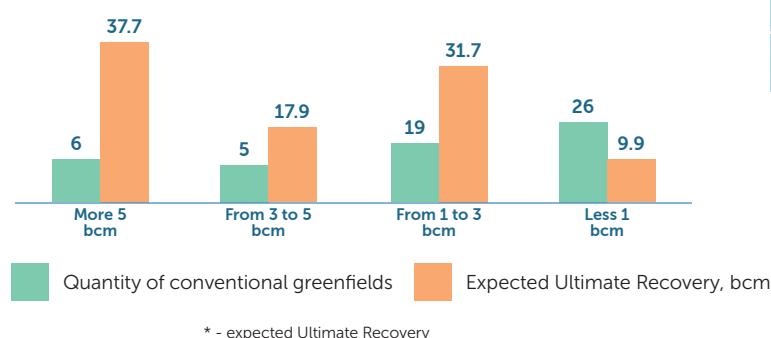
The division is actively working on a detailed analysis of the licenses available in the portfolio and their prioritization for further focus, primarily on the most promising areas. In addition, measures are taken to reduce the risks of hydrocarbon exploration (seismic surveys, exploration drilling, etc.) to fully understand the potential of the sites, and, as a result, to develop further algorithms (large-scale development of the site or return of licenses to the State). According to internal expert estimates, conventional greenfield EUR is ~ 36 bcm (including only licenses with positive economics and assuming exploration success).

### Key next steps

1. Dedication of asset-management teams for each specific priority greenfield	Q2 2021
2. Start of active exploration activities on prioritized fields	Q3 2021

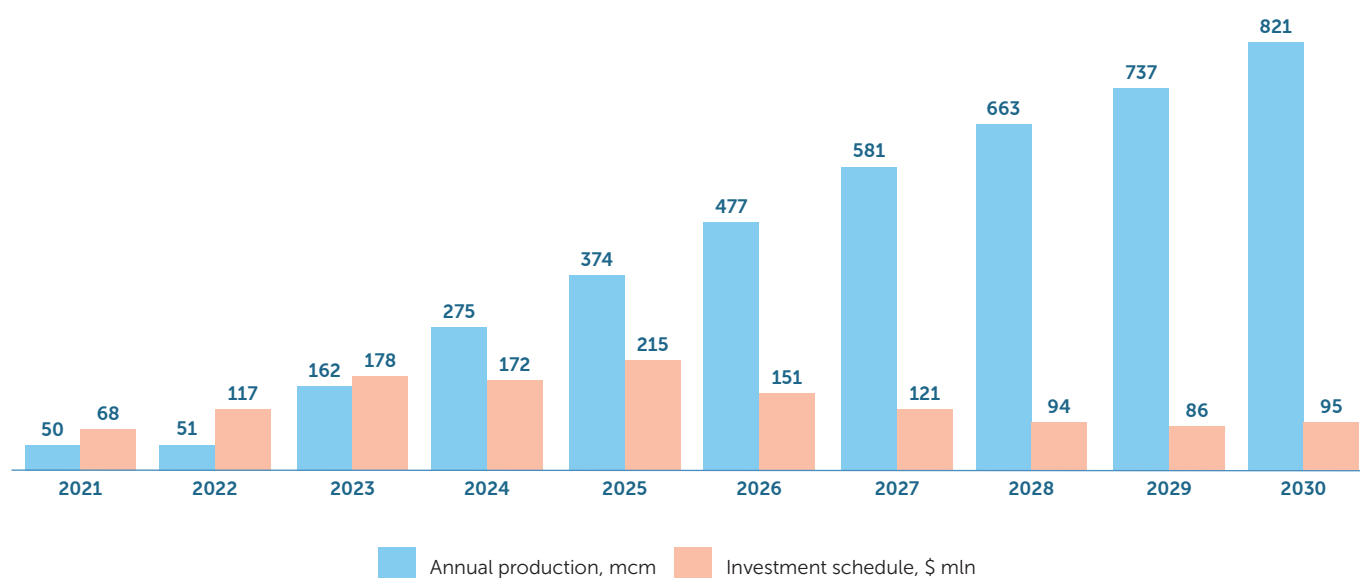
Parameter	Value
Stage	Exploration & Appraisal
Exploration & Appraisal	Up to 30 years
Acreage, sq.km	~10 000
Location	Both Easter and Wester Ukraine
Gas type	Conventional
Average well depth, meters	1 000 to 6 000
EUR*, P50	97 bcm
Year of first production	2021 to 2024
Total CAPEX, \$ mln	>1 500
Total CAPEX, \$ mln	2 875
Total number of wells to be drilled	>400

### Naftogaz E&P conventional greenfields portfolio



Production total – 4 192 bcm

Investment schedule total – \$ 1 296 mln





## PEC (PRODUCTION ENHANCEMENT CONTRACT)

H1 2021

### Partnership candidate selection

In H1 2021, Naftogaz plans to conduct expedite but thorough diagnostics of its mature field bank and select candidates for partnerships

For partnership considerations, Naftogaz will apply the following criteria, including:

- Reserves and production
- Resources and reserves addition potential
- Field cost level and new project economics

Importantly, Naftogaz will also take into consideration its own capabilities and resources to enhance production and improve economics

H2 2021 – H1 2022

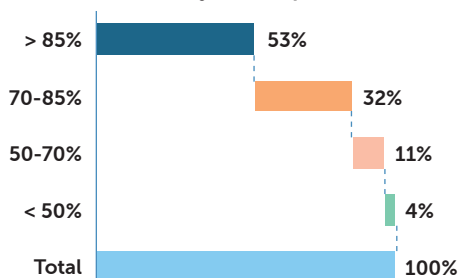
### Fast-track wholesale process

Following candidate selection, Naftogaz will conduct one or several fast-track partner attraction processes

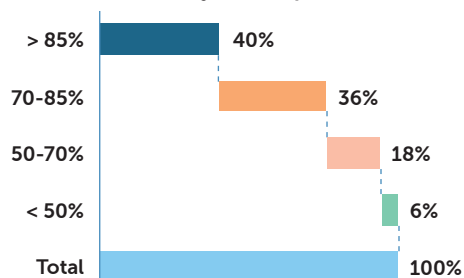
Naftogaz will aim to be an attractive partner for top global E&P and OFS players

Naftogaz will consider different forms of partnership and combinations of field selection depending on the results of diagnostics and interest of potential partners

2P reserves by field depletion levels



Production by field depletion levels



## CARPATHIANS PROJECT

### Executive summary

Carpathian region is highly undeveloped with significant up to 10 000 sq.km of white space (free acreage) available for E&A activities.

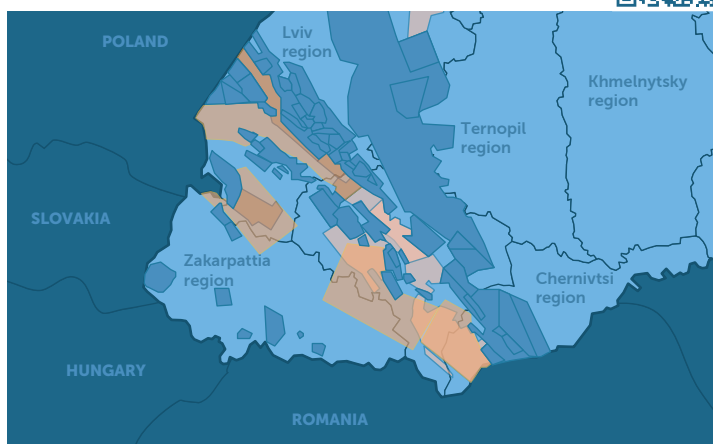
Rocks in this region are very similar to those successfully explored and developed in the neighboring countries (Poland, Romania, Slovakia and Hungary).

Naftogaz evaluates gas potential of this acreage at >1.5 tcm GIIP and EUR.

Naftogaz has launched a comprehensive study campaign of the region, including analysis of existing data, as well as shooting and analyzing new 3D and regional seismic, in order to understand its potential better and make investment decision regarding its further development.

### Key next steps

1. Start regional studies to determine blocks' potential	Q1 2022
2. Nominate blocks for PSAs / auctions	Q4 2021
3. Win PSA tenders / auctions for some of the blocks selected	Q3 2022
4. Obtain special permits (licenses) for the blocks	Q1 2023
5. Start 2D and 3D seismic surveys campaign	Q2 2023
6. Spud first exploration well	Q1 2025



**Regions:** Ivano-Frankivsk, Lviv, Chernivtsi, Zakarpattia

**Depth:** ~ 2.5 km

**Type of deposits:** conventional collectors

**EUR (P50)\*:** ~ 20-60 bcm

\* EUR - estimated ultimate recovery assessed with probability 50% (P50)

To date, Naftogaz Group has signed memorandums of understanding on cooperation with the leading integrated energy company in Southeast Europe - Romanian OMV Petrom, and with the largest Polish state-owned company, PGNiG, for joint geological exploration to select promising areas and further cooperation through production-sharing mechanisms. In 2021, the division plans, together with partners, to study in detail the geological potential and the possibility of further cost-effective development of the region.



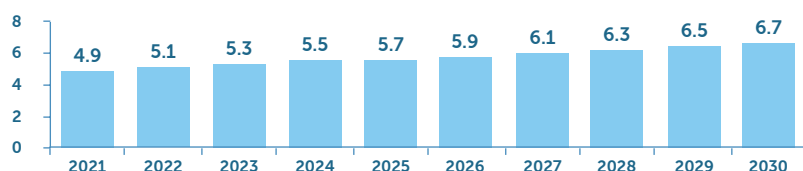
## STRATEGIES OF INDEPENDENT UKRAINIAN PRODUCERS

### Private companies' strategies

To assess the effects of the gas sector development on the Ukrainian economy in 2021 to 2030, the following assumptions related to the private companies' strategies and their KPIs have been made:

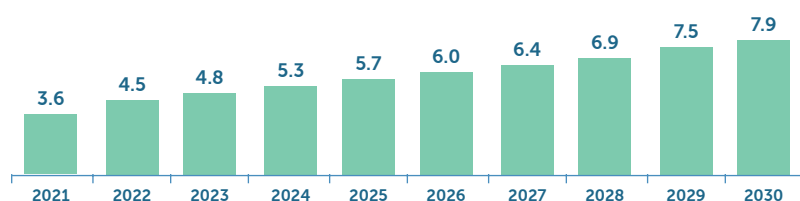
- Production volume, as listed on the diagram to the right
- Yearly CAPEX is forecast as a ratio to revenue on the basis of the benchmarking analysis conducted over Naftogaz's data on the Baseline scenario
- Annual OPEX is projected as a product of gross gas output and OPEX per 1 000 cm of gas produced, based on the benchmark derived from Naftogaz's data on the Baseline scenario
- Naftogaz's 2018 OPEX structure was applied throughout the forecast period
- To forecast royalty payments, wells being developed before 1 January 2018 represent 100 percent of the total wells in 2020, and the rates of yield of these wells fall at the rates of yearly contraction of Naftogaz's baseline production scenario. It was assumed that wells less than 5 000 metres deep represent 80 percent of wells being developed before 1 January 2018 and 40 percent of wells being exploited after 1 January 2018
- Depreciation charges of existing assets were calculated using Naftogaz's depreciation to revenue ratio. The useful life for new assets is 20 years
- Oblast structure is accepted at the 2019 breakdown, calculated per Ukrstat data

### GROSS NATURAL GAS PRODUCTION, BCM



Source: KPMG Ukraine 'Assessment of Gas Production Industry Impact on the Ukrainian Economy'.

### CAPEX, UAH BLN



Note: the average exchange rate in 2019 according to NBU was 25.85 USD/UAH.

Source: KPMG Ukraine 'Assessment of Gas Production Industry Impact on the Ukrainian Economy'.

Cumulative production **57.6** bcm

Cumulative OPEX **25.1** UAH bln

Cumulative CAPEX **58.6** UAH bln

### CAPEX BENCHMARK FOR OUTLOOK ON PRIVATE COMPANIES, 2021 – 2030

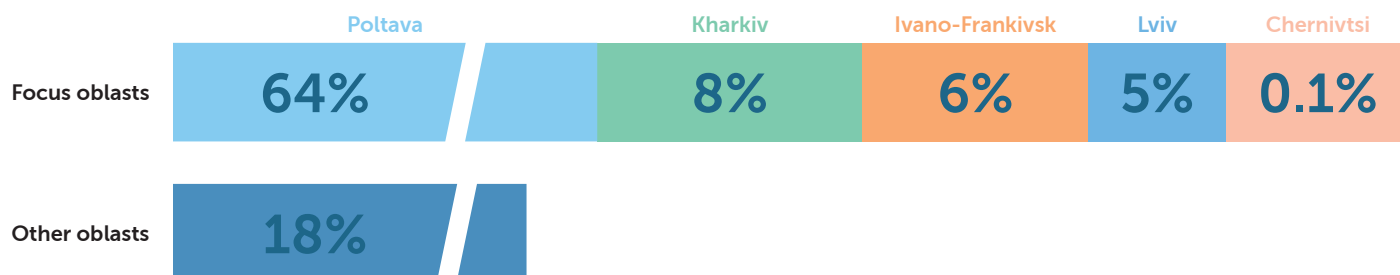
CAPEX as % of revenue,

**13.2%**

Naftogaz's baseline average for 2021 – 2030

Source: Naftogaz data.

### OBLAST STRUCTURE



Notes: (a) OPEX does not include rental payments and depreciation charges.

(b) Shown as production volumes that can be achieved provided that exploration works are 100 percent successful.

Source: Authors' analysis based on data by Ukrstat.

## DEVELOPMENT STRATEGY (PSA)



### OLESKA BLOCK

In Ukraine, the process of shale gas development began with the development of two sites, one of which is the Oleska site. Oleska block is a field of gas-bearing shales, located within the Lviv, Ivano-Frankivsk and Ternopil regions.

In 2011, within the framework of the production sharing agreement, the site was put up for a PSA tender. Amid others, the following companies have applied to partake in the tender: Chevron, ENI, and among the probable bidders were such companies as: ExxonMobil, Ukrnafta and Naftogaz Ukraine.

### Chronology

1. Announcement of a tender for product sharing agreements	30 November, 2011
2. Chevron was announced to have won the tender	14 May, 2012
3. Signing of an agreement between the Government of Ukraine and Chevron	5 November, 2013
4. Issue of special subsoil use permit for 50 years	9 April, 2014
5. The Board of Directors decided to terminate the activities of Chevron Ukraine BV (Chevron Ukraine B.V.) in Ukraine.	2 July, 2015
6. 100% of share in the PSA on Oleska block belongs to the state represented by NJSC Nadra Ukrainy	2021

### Minimum work programme

The minimum work programme envisages drilling 13 wells (8 vertical wells and 5 fishbone wells) and conducting 1 500 sq.km of 2D seismic for 5 years.

Currently, NJSC Nadra Ukrainy, which owns 100% of the PSA share, is looking for a partner to implement PSA project in the Oleska subsoil block of 6 324 sq.km.

Parameter	Value
Acreage, sq.km	6 324
Location	Lviv, Ivano-Frankivsk and Ternopil regions
The analysis of geological and geophysical materials gives grounds to forecast the discovery of oil and gas fields within this area with promising resources	
Conventional gas, bcm	27.0
Shale gas, tcm	1.6
Tight gas, tcm	1.4
Reservoir depth	2000 - 4000 m



### Current status

Pursuant to the provisions of the PSA, Chevron Ukraine B.V. unilaterally withdrew from the PSA, having Nadra Oleska acquire all the rights and obligations under the PSA. Today, the PSA is in force. Nadra Oleska has a valid special subsoil use permit.

After attracting a new investor to implement the PSA, the investor in question, Nadra Oleska and the State can amend the PSA and harmonize its provisions with the current state of affairs. After signing revised Oleska PSA, the process of reissuing a special subsoil use permit will take place, indicating the new investor.

## DEVELOPMENT STRATEGY (AUCTIONS)

The Investment Atlas currently offers 40 oil and gas blocks, each of them contains descriptive information and availability of the geological data. All this information is located at the website [www.geo.gov.ua](http://www.geo.gov.ua).

Each of the block can be nominated by an investor for the auction. In order to do so, an investor should make a formal request to the Ukrainian Geological Survey. This block will be put for auction. Below there are some of the blocks available for nomination for an e-auction.

### SOUTH-RUSANIV BLOCK

The block is located in the central part of the Northern zone of the Dnieper-Donetsk basin.

According to the oil and gas geological zoning, South-Rusaniv block is located within Hlynko-Solokhivsky oil and gas area (density of non-exploratory production resources of 100-200 thousand tonnes of hydrocarbons per 1 sq.km) and Talalaivsko-Rybalsky oil and gas area.

According to Nadra of Ukraine NJSC, there are 16 wells within the block drilled for oil and gas and liquidated in the appropriate manner.

#### Minimum work programme

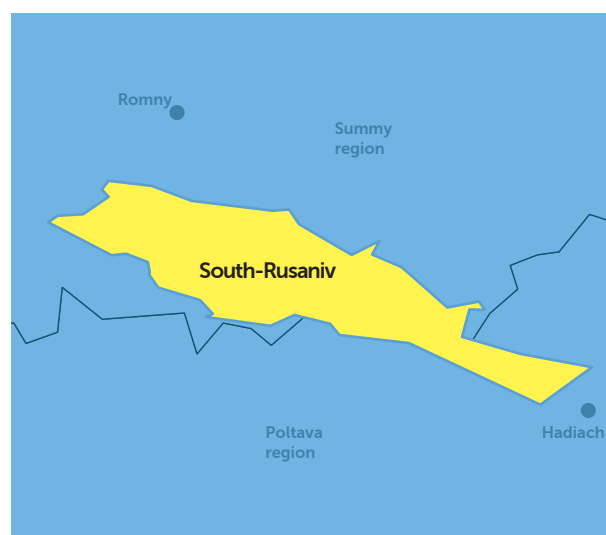
Stage I (12 months) - processing and reinterpretation of 2D seismic data;

Stage II (12 months) - conducting 2D or 3D seismic on 1/4 of the block area;

Stage III (24 months) - drilling at least one productive well.



Block characteristics	
Acreage, sq.km	317
Location	Romensky district of Sumy region and Myrhorod district of Poltava region.
Effective gas-saturated thickness of sandstones	3.2-4.8 m
Resources/reserves assessment, bcm	3.33 billion m <sup>3</sup> (class code - 334 locks)
Type, period of subsoil use	Geological study and industrial development of the field - 20 years





## ANDRIYIVSKA BLOCK

Andriyivska block is located in the central part of the axial zone of the Dnieper-Donetsk basin within the Mashiv-Shebelinsky gas-bearing block, which is characterized by intense manifestations of salt tectogenesis. Hydrocarbon deposits of the Sukhodolivske field lie at a depth of 2 440 – 3 754 m. They formed a multilayered field with an oil-and-gas bearing area of more than 1 300 m.

### Minimum work programme

Stage I (12 months) - processing and reinterpretation of 2D seismic data

Stage II (12 months) - conducting 2D or 3D seismic on 1/4 of the block area

Stage III (24 months) - drilling of at least one production well.



Block characteristics	
Acreage, sq.km	47
Location	Poltava district, Poltava region, 35 km southeast of Poltava, 6 km south of t. Mashivka. Andriyivka, Krasnogirka and Dmytrivka villages are located on the territory of the block
Effective gas-saturated thickness of sandstones	-
Resources/reserves assessment, bcm	Hydrocarbon reserves are not accounted within the block
Type, period of subsoil use	Geological study and industrial development of the field – 20 years

## KNYAZHYNSKA BLOCK

Knyazhynska block is located in one of the most promising oil and gas bearing regions of Ukraine. The prospects of the site are connected with productive deposits at the neighboring Bezpalyvsky, Melykhivsky, VostochnoMedvedevsky hydrocarbon fields.

The reservoir porosity varies slightly - from 12% to 18%, gas saturation - from 45-50% to 80-85%.

### Minimum work programme

Stage I (12 months) - processing and reinterpretation of 2D seismic data.

Stage II (12 months) - conducting 2D or 3D seismic on 1/4 of the block area.

Stage III (24 months) - drilling at least one productive well.





## ZHUKIVSKA BLOCK

Zhukivska block is located in the central part of the axial zone of the Dnieper-Donetsk rift.

No drilling was carried out directly on Zhukivska block.

### Minimum work programme

Stage I (12 months) - processing and reinterpretation of 2D seismic data.

Stage II (12 months) - conducting 2D or 3D seismic on 1/4 of the block area.

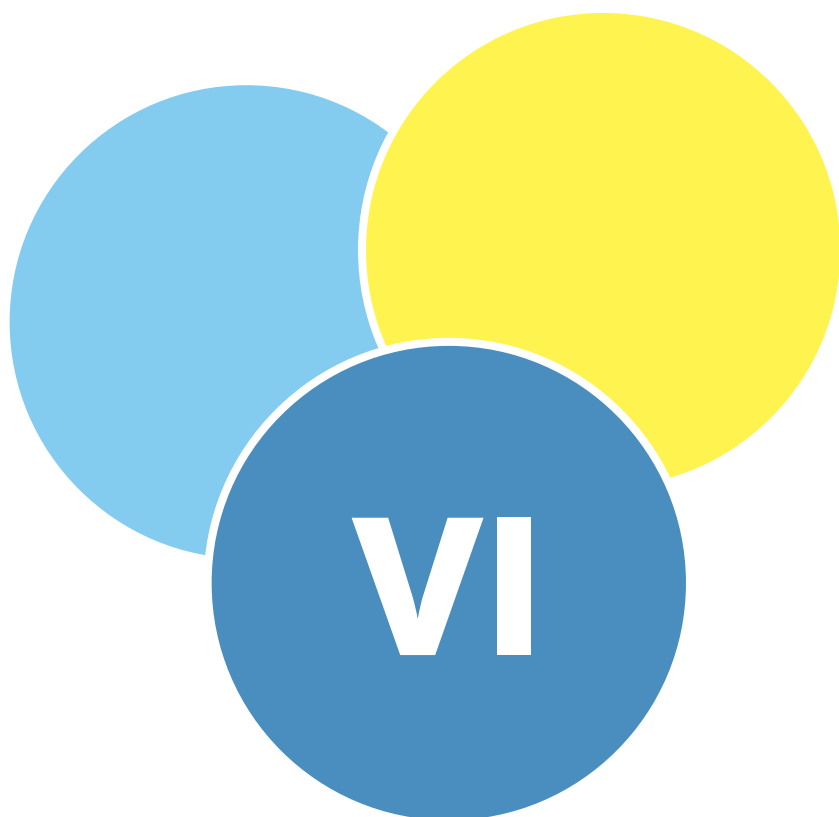
Stage III (24 months) - drilling at least one productive well.



Block characteristics	
Acreage, sq.km	57.2
Location	Poltava district, Poltava region. Poltava is a regional center located in 9 km to the south of the area
Effective gas-saturated thickness of sandstones	-
Resources/reserves assessment, bcm	not estimated
Type, period of subsoil use	Geological study and industrial development of the field – 20 years

Block characteristics	
Acreage, sq.km	75.3
Location	Novovodolazsky district Kharkiv region
Effective gas-saturated thickness of sandstones	From 0.6 m to 10.0–20.0 m
Resources/reserves assessment, bcm	80.478 million tonnes including: gas – 62.158 bcm oil – 14.6 million tonnes condensate – 3.72 million tonnes
Type, period of subsoil use	Geological study and industrial development of the field – 20 years





## Terms and abbreviations

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**AGPU** – Association of Gas Producers of Ukraine.

**BCM** – billion cubic meters.

**CAPEX** – Capital expenditure or capital expense.

**CMS** – Cameron McKenna Nabarro Olswang.

**EUR** – Euro.

**EUSTREAM** – Slovak gas transmission system operator.

**GAS** – natural gas, unless stated otherwise.

**GAZPROM** – Public Joint Stock Company Gazprom, a Russian energy company.

**GTS** – gas transportation system.

**JSC Ukrgasvydobuvannya, Ukrgasvydobuvannya (UGV)** – Joint Stock Company Ukrgasvydobuvannya.

**NAFTOGAZ GROUP** – a group of companies that consists of NJSC Naftogaz of Ukraine, JSC Ukrgasvydobuvannya, JSC Ukrtransgaz, JSC Ukrtransnafta, LLC Naftogaz of Ukraine Gas Supply Company, LLC Naftogaz Teplo Gas Supply Company, LLC Naftogaz Trading Gas Supply Company, SC Gas of Ukraine, SE Uktavtogaz, JSC Chornomornaftogaz, OJSC Kirovohradgaz, SE Zakordonnaftogaz, JSC Ukrspetstransgaz, Naftogaz Overseas SA, SE Ukrnaftogazkomplekt, SE Naukanaftogaz, SE Naftogazobsluhovuvannya, SE LIKVO, SE Naftogazbezpeka, SE Budivelnik.

**PJSC UKRNAFTA, UKRNAFTA (UN)** – Public Joint Stock Company Ukrnafta.

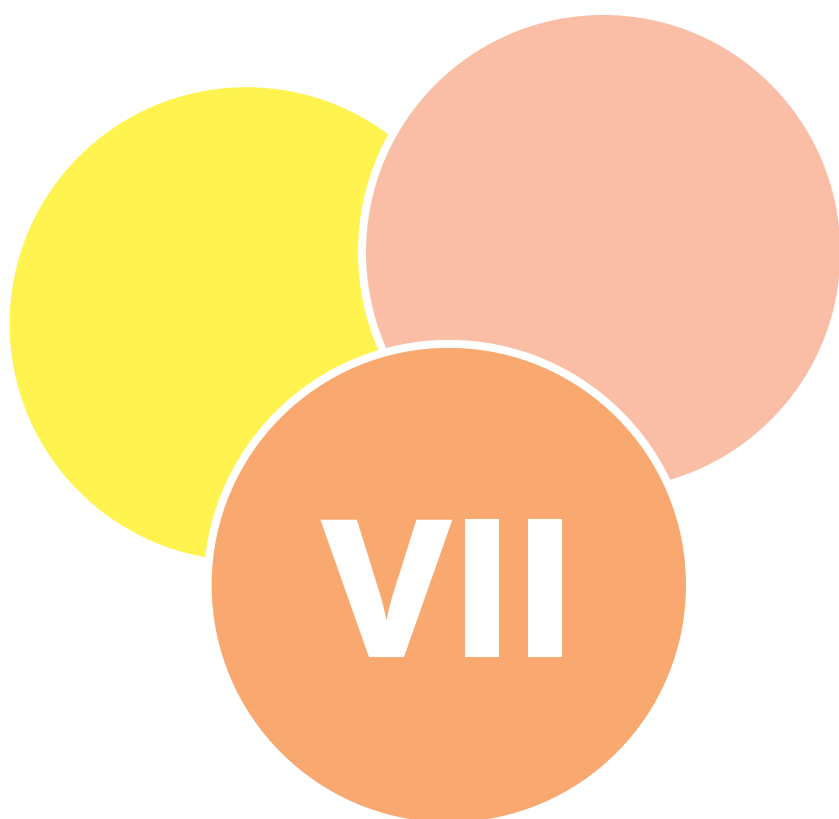
**PSA** – Production Sharing Agreements.

**Private companies** – DTEK Oil&Gas, Diloretio Group, Ukrnaftoburinnya, Smart Energy, Poltava Petroleum Company, Zakhidnadraserbis, Geo Alliance Group and KUB-GAS, and other companies producing natural gas and oil on the territory of Ukraine.

**POS** – probability of success.

**UGS** – underground gas storage.

**USD/\$** – United States Dollar.



## Contacts and references

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## Association of Gas Producers of Ukraine

[www.agpu.org.ua](http://www.agpu.org.ua)

+38 044 536 53 64  
office@agpu.org.ua



## Ministry of Energy of Ukraine

[www.mpe.kmu.gov.ua](http://www.mpe.kmu.gov.ua)

+38 044 594 66 05  
kanc@mev.gov.ua



## CMS Cameron McKenna Nabarro Olswang (Ukraine)

[www.cms.law](http://www.cms.law)

+38 044 391 33 77  
vitaliy.radchenko@cms-cmno.com



## Ukrasvydobuvannya (Naftogaz Group)

[www.ugv.com.ua](http://www.ugv.com.ua)

+38 044 272 31 15  
bd@ugv.com.ua



## Ukrainian Geological Survey

[www.geo.gov.ua](http://www.geo.gov.ua)

+38 044 456 23 57  
m.kamasa@geo.gov.ua



## UkraineInvest

[www.ukraineinvest.gov.ua](http://www.ukraineinvest.gov.ua)

+38 044 256 78 32  
andrii.pavliv@ukraineinvest.gov.ua

### Useful links:

GEOINFORM OF UKRAINE  
[www.geoinf.kiev.ua](http://www.geoinf.kiev.ua)

National Geological Portal  
[www.nadra.gov.ua](http://www.nadra.gov.ua)

GTS Operator of Ukraine  
[www.tsoua.com](http://www.tsoua.com)

Ukrtransgaz  
[www.utg.ua](http://www.utg.ua)







Ukraine Oil & Gas Industry Guide 2021

