



OIL AND GAS IN POLAND 2020-2021

**TENDER
PROCEDURE**

**OPEN DOOR
PROCEDURE**

DATA ROOM

**INFORMATION
AND OPPORTUNITIES**



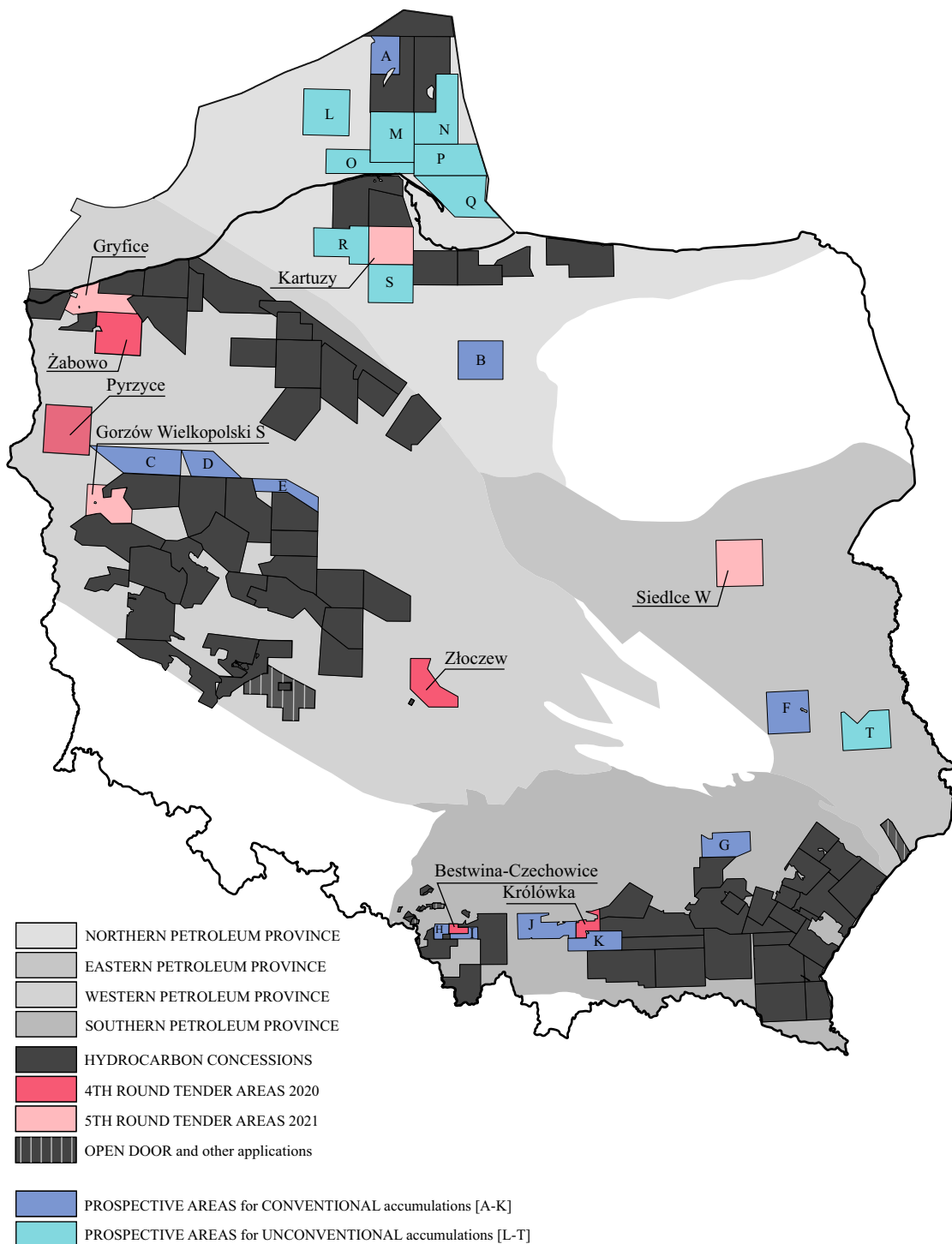
MINISTRY
OF THE ENVIRONMENT



POLISH GEOLOGICAL INSTITUTE
NATIONAL RESEARCH INSTITUTE

OIL AND GAS IN POLAND

2020-2021 INFORMATION
AND OPPORTUNITIES



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		OTHER PROSPECTIVE AREAS	TARGET
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	L	BLOCK E47/E68	Lower Paleozoic ^{Ush}
	M	ŁEBA S	Lower Paleozoic ^{Ush} ; Cambrian ^{C+Ut}
	N	ROZEWIE S	Lower Paleozoic ^{Ush} ; Cambrian ^{C+Ut}
	O	WŁADYSŁAWOWO	Lower Paleozoic shales ^{Ush} ; Cambrian ^{C+Ut}
	P	JASTARNIA	Cambrian ^{C+Ut}
	Q	HEL	Cambrian ^{C+Ut}
	R	SIERAKOWICE	Lower Paleozoic ^{Ush} ; Cambrian ^{Ut}
	S	NOWA KARCZMA	Lower Paleozoic ^{Ush} ; Cambrian ^{C+Ut}
	T	REJOWIEC FABRYCZNY	Lower Paleozoic ^{Ush}

PREFACE

The granting of a hydrocarbon concession in Poland (for prospection, exploration and production of hydrocarbons from a deposit) is proceeded according to a TENDER procedure or OPEN DOOR procedure - on a request of an entity.

On the 13th of March 2020, the 4th TENDER round for the above mentioned concessions has begun and will last until 2nd of November 2020. Five tender areas, promising for discoveries of conventional and unconventional oil and gas deposits, are the subject of the tender. In this folder, we present some basic information about these areas, including characteristics of geology and petroleum plays with maps illustrating geographic position, neighboring concessions, hydrocarbon deposits, wells, and seismic surveys.

The detailed geological data on the tender areas (location, environmental restrictions, geology, petroleum plays, hydrocarbon deposits, wells, seismic surveys, gravimetry, magnetic and magnetotelluric investigations, as well as petroleum prospectives) are collected in the individual GEOLOGICAL DATA PACKAGES, which are published on the websites:

<https://www.pgi.gov.pl/en/tender-blocks.html>
<https://bip.mos.gov.pl/koncesje-geologiczne/>

These data are also available in DATA ROOM, which is organized in the National Geological Archive (Polish Geological Institute-National Research Institute, 4 Rakowiecka St., Warsaw, Poland):

<https://www.pgi.gov.pl/docman-tree-all/aktualnosci-2020/7770-data-room-aktualizacja-202004-14/file.html>

Every year, the geologists of the Polish Geological Institute-National Research Institute and Department of Geology and Geological Concessions of the Ministry of the Environment select PROSPECTIVE AREAS - promising for discoveries of conventional and unconventional oil and gas deposits, based on the geological data resources stored in the National Geological Archive. In 2019 and 2020, twenty-four areas have been selected in total (seven located offshore, and another seventeen - onshore). Four of them are dedicated to the next - 5th tender round, planned in 2021. Some basic informations about these areas can be found in this folder, as well.

An entity may also apply for a concession in any area that is not a subject of a tender or other concession (OPEN DOOR procedure). The area cannot be greater than 1200 km², as well.

A concession is granted for a period of 10 to 30 years and is divided into: (I) exploration phase, (II) production phase (starts after obtaining an investment decision). In the case where a deposit is partly documented, it is also provided that the hydrocarbon production from the deposit can be started even as the exploration phase is still underway.

We believe that this publication will contribute to a better understanding of the Polish licensing law and encourage investments in the Polish oil and gas market. For details, please visit:

<https://www.gov.pl/web/srodowisko/ustawa-prawo-geologiczne-i-gornicze-z-rozporzadzeniami-w-angielskiej-wersji-jezykowej>

With best regards,



QUALIFICATION PROCEDURE

Every entity interested in obtaining a hydrocarbon concession in Poland needs to go the qualification procedure. During this, an entity is assessed in terms of state security. The requirements include positive opinions of the Head of the Internal Security Agency and the Head of the Foreign Intelligence Agency. The application for the qualification procedure is submitted (in 3 copies) to the Ministry of the Environment. The application shall include:

- 1. data identifying the entity, including designation of its legal status;
- 2. data relating to the capital structure and capital links of the entity;
- 3. data relating to the sources of origin of the financial resources, and relating to the financial condition of the entity;
- 4. data relating to the organizational structure of the entity;
- 5. data of all persons who are members of managing and supervising bodies as well as data of persons acting under the authority of the same, including, in the case of:
 - a) Polish citizens or foreigners with PESEL number assigned – first and last name, PESEL number, and position or function performed in a given entity,
 - b) foreigners without PESEL number – first and last name, date, and place of birth, first names of parents, nationality, current residence address, passport number or number of another document confirming their identity, as well as position or function performed in a given entity;
- 6. signature of a person authorized to submit statements of will on behalf of the entity.

The application form and the requirements regarding the attachments are set out in Regulation of the Council of Ministers of 20 April 2015 on the application for a qualification procedure:

https://www.gov.pl/documents/1379842/1381036/Rozp_M%C5%9A-w_z_dnia_20_kwietnia_2015_r_EN.DOCX/f0be03a8-67e2-3d3d-bb01-ceb90d42c732

The assessment of the qualification is valid for 5 years. The entity has a right to apply for conducting a new qualification procedure, but not later than 4 months before the expiration date of the valid decision. The entity has 14 days to inform the Ministry of the Environment about changes of information mentioned in points 1-5.

The Ministry of the Environment provides an up-to-date register of qualified entities on the website:

<https://www.gov.pl/web/srodowisko/wykaz-podmiotow-kwalifikowanych>



4TH TENDER ROUND SCHEDULE

June, 28th 2018	boundaries of five areas selected for the 4th tender round for hydrocarbon concessions in Poland announced!
December, 16th 2019	DATA ROOM available!
March, 13th 2020	GEOLOGICAL DATA PACKAGES published! TENDER beginning!
March, 13th 2020 - November, 2nd 2020	CALL FOR TENDER! https://bip.mos.gov.pl/koncesje-geologiczne/przetargi-na-koncesje-na-poszukiwanie-rozpoznawanie-i-wydobywanie-weglowodorow/czwarta-runda-przetargow-2019/ timeframe for offer submission for entities with a positive result of the qualification procedure
June, 26th 2020	boundaries of four areas selected for the 5th tender round for hydrocarbon concessions in Poland announced!

The offers evaluation will be based on the following criteria:

1. Experience in exploration of hydrocarbon deposits or production of hydrocarbons from deposits.
2. Technical ability to perform the above mentioned activities.
3. Financial capabilities of the bidder.
4. Technology of conducting geological work.
5. Scope and timing of the proposed geological works.

6. Scope and timing of mandatory geological sampling.

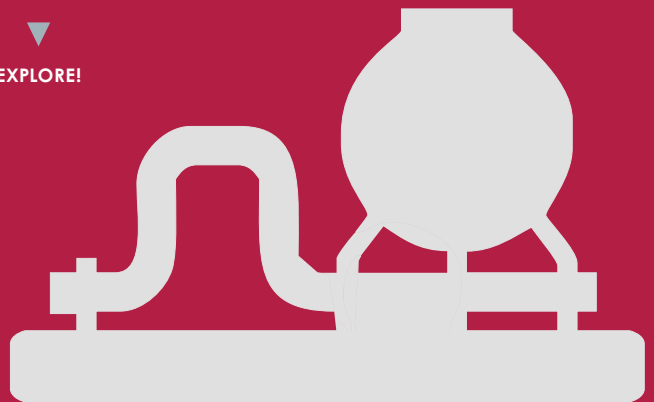
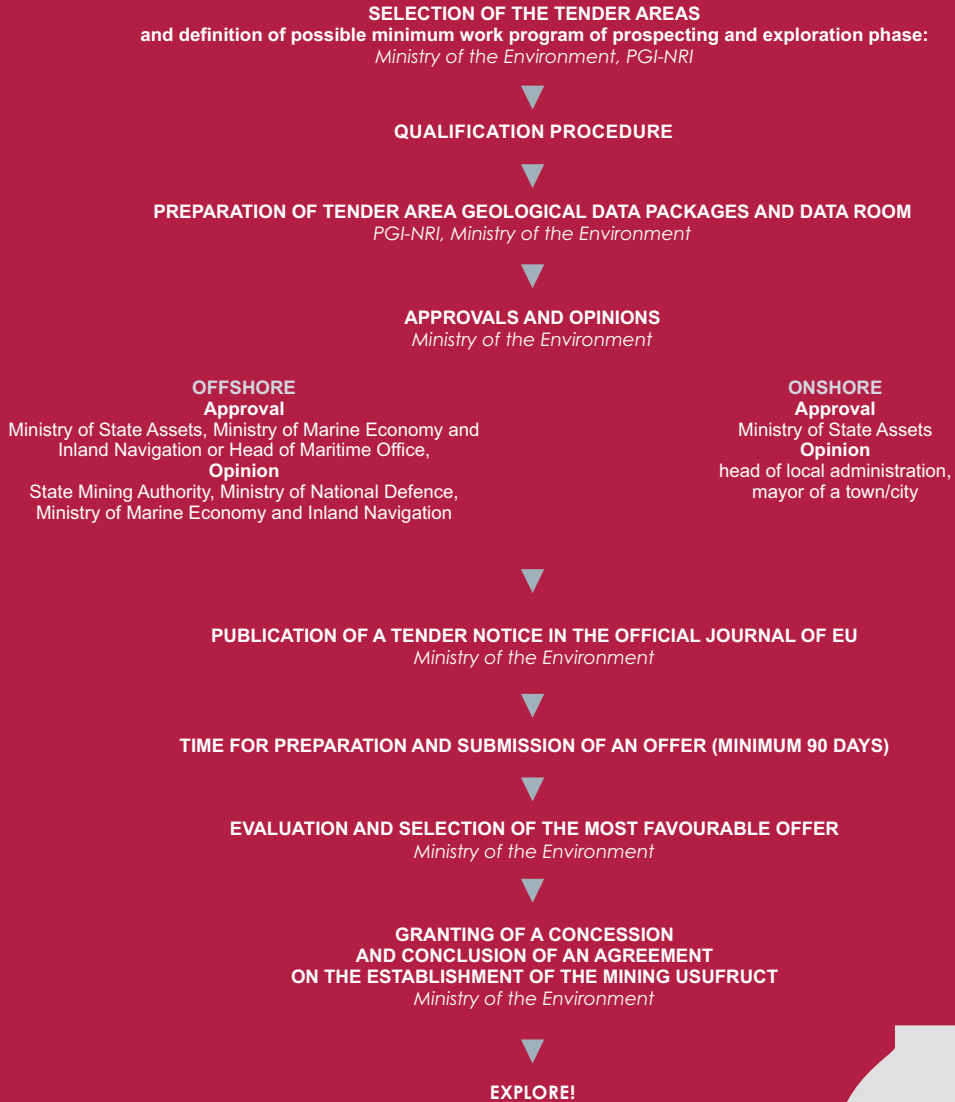
7. Scope of cooperation with research units in development and implementation of innovations in the exploration/production of hydrocarbons.

List of approved research units will be published on the following website:

<https://www.gov.pl/web/srodowisko/podstawowe-informacje>



TENDER PROCEDURE SCHEME



GEOLOGICAL DATA PACKAGES

The areas dedicated to each tender round are described in details in individual GEOLOGICAL DATA PACKAGES. They include:

1. Information about location, administrative center, previous and current concessions, and main exploration targets.
2. Environmental restrictions, which could be important during exploration, such as protected areas and occurrences of other mineral deposits.
3. General description of geology and tectonics including maps and cross-sections with identification of the main exploration horizon and other horizons as an additional target.
4. Stratigraphy and lithology of the succession with facies and petrographic analysis.
5. Petroleum plays reconstruction with identification of the main source rocks, reservoir rocks and seal, as well as interpretation of the generation, migration and expulsion processes.

6. Oil and gas fields description located in the neighborhood - as analogues for further exploration with history of production, trap parameters, wells and resources.

7. Wells with a description of stratigraphy, porosity, permeability and geophysical logs summary.

8. Seismic survey map and list.

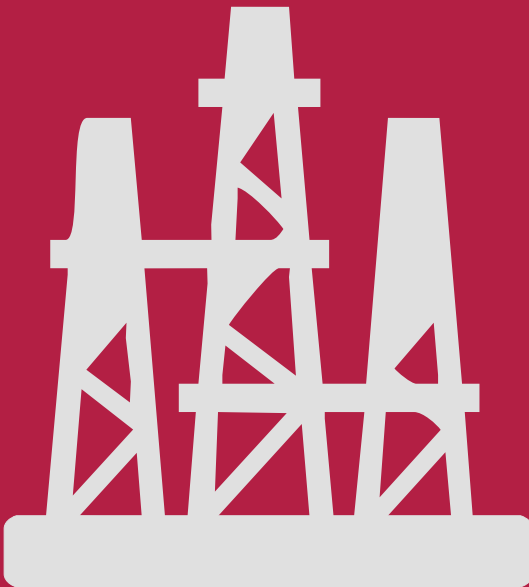
9. Gravimetry, magnetic and magnetotelluric research.

10. Hydrocarbon prospective analysis with a summary of the available data and identification of the most important prospects.

The GEOLOGICAL DATA PACKAGES are published on the websites:

<https://www.pgi.gov.pl/en/tender-blocks/geological-data-sets.html>

<https://bip.mos.gov.pl/koncesje-geologiczne/przetargi-na-koncesje-na-poszukiwanie-rozpoznawanie-i-wydobycie-weglowodorow/>



DATA ROOM

The source data, which are described in the **GEOLOGICAL DATA PACKAGES**, are collected in **DATA ROOM**, which is available for every entity interested in exploration activity in Poland.

The **DATA ROOM** is organized in the National Geological Archive at:

*Polish Geological Institute
National Research Institute
4, Rakowiecka Street
00-975 Warsaw
POLAND
phone +48 22 45 92 501
email: kwoj@pgi.gov.pl
room 1s*

on Mondays, December 2019 - September 2020.

Before you visit the Polish Geological Institute - National Research Institute, please make sure the term you choose is free. We kindly ask you to reserve the term of your visit at least 1 week before.

The visit on the website:

<https://www.pgi.gov.pl/en/tender-blocks.html>

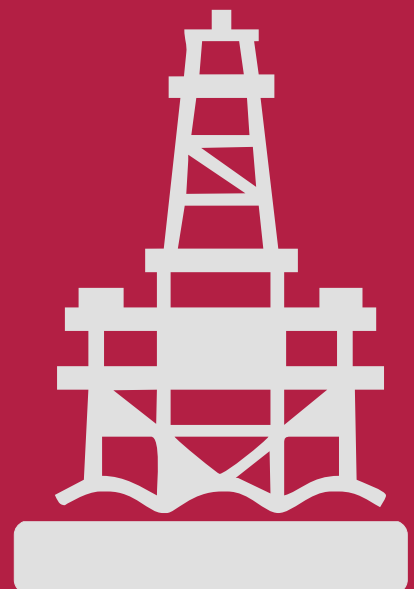
and reading of the **GEOLOGICAL INFORMATION PACKAGES**:

<https://www.pgi.gov.pl/en/tender-blocks/geological-data-sets.html>

is kindly suggested before your arrival.

The **DATA ROOM** includes the information about the areas dedicated to the 4th tender round for hydrocarbon concessions in Poland: Bestwina-Czechowice, Królówka, Pyrzyce, Złoczew and Żabowo. The following data are available:

1. Wells reports - original documentations, prepared just after drilling, containing geological and technical description, production tests, geophysical logs and results of geochemical analysis.
2. Seismic reports - original documentation containing results of seismic surveys and their interpretation.
3. Oil and gas field reports - documentation containing detailed description of hydrocarbon field with calculation of resources.
4. Digital geophysical well logs collected in the Interactive Petrophysics project.
5. Digital 2D and 3D seismic data collected in the DugInsight and Petrel projects.
6. Digital geochemical and geophysical results collected in the OpenAccess project.
7. Collection of geological and geophysical maps in the GIS project.



OPEN DOOR PROCEDURE

The entity can also choose the area and apply for a license submitting an application to the Ministry of the Environment. The area indicated by the entity cannot be a subject of a tender or any other concession, and the maximum acreage is 1200 km².

In the case that several applications are submitted for the same area, the first one is announced. The announcement published in the EU Official Journal contains:

1. Information about the submission of an application for a concession.
2. Type of activity for which a concession is to be granted (exploration and production or production itself).
3. The area in which the activity is to be carried out.
4. Deadline for submission of competitive offers – at least 90 days.
5. Criteria of evaluation of offers together with the determination of their significance:
 - 5a. Experience in performing activities of exploration of hydrocarbon deposits or production of hydrocarbons from deposits.
 - 5b. Technical ability to perform above mentioned activities.

5c. Technology of conducting geological works.

5d. Financial capabilities of the bidder.

5e. Scope and timing of proposed geological works.

5f. Scope and timing of mandatory geological sampling.

5g. Scope of cooperation with research units in development and implementation of innovations in the exploration/production of hydrocarbons.

List of approved research units will be published on the following website:

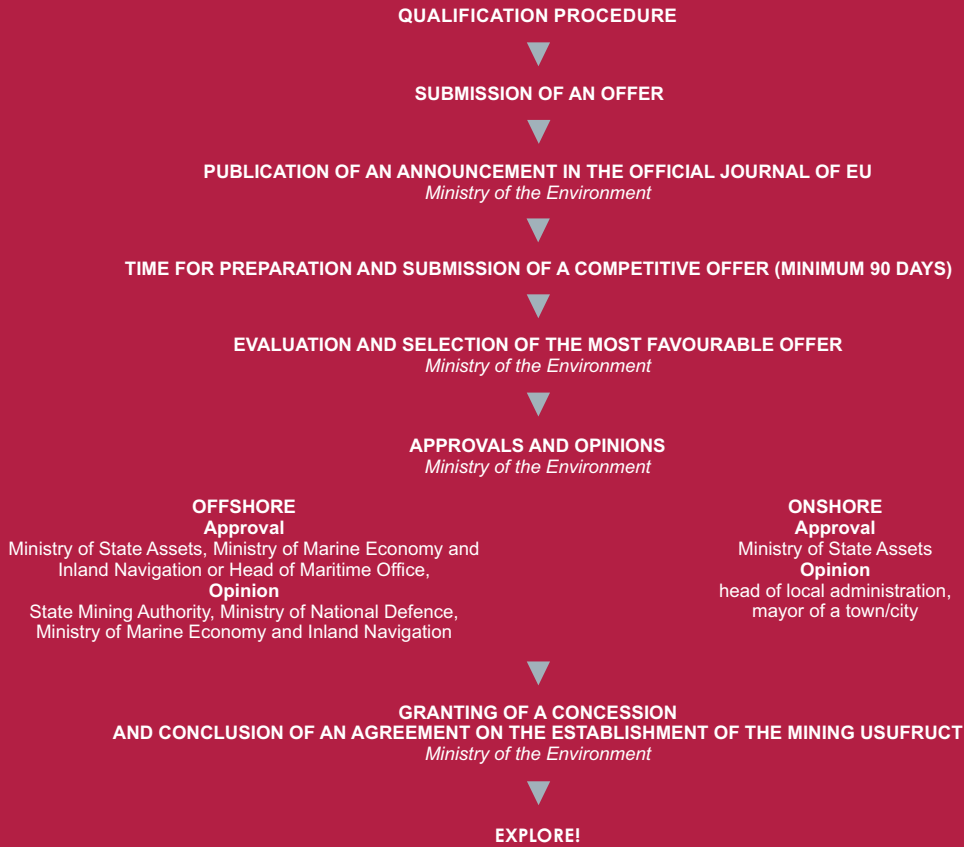
<https://www.gov.pl/web/srodowisko/podstawowe-informacje>

After the deadline for submission of competitive offers expires, the concession authority evaluates the submitted offers and then conducts the administration procedure for the entity that obtained the highest rating. Under the administration procedure, the Ministry of the Environment obtains approvals and opinions from the authorities indicated in the Geological and Mining Law.

The ministry grants the concession to the entity or consortium who submitted the application. Before the granting of a concession, the consortium must submit a cooperation agreement concluded by all the parties.



OPEN DOOR PROCEDURE SCHEME





4TH TENDER ROUND

March 13, 2020 - September 9, 2020

5 AREAS



1. TENDER AREA BESTWINA-CZECHOWICE



**ACREAGE: 83.25 km²
20,571 ACRES**

Location: onshore; in the areas of the following counties and communes: Śląskie province, Bielsko-Biała county, communes: Czechowice-Dziedzice (61.41% of the area), Jasienica (2.47%), Bestwina, (20.97%), Wilamowice (2.11%); Bielsko-Biała urban county, urban commune Bielsko-Biała (6.12%); Pszczyna county, commune: Goczałkowice-Zdrój (6.92%).

The Bestwina-Czechowice tender area is located in the Southern Petroleum Province, also called the North Carpathians Province by the USGS. The area can be described as a typical example of undercapitalized areas. The main phase of exploration efforts in the neighborhood of the Bestwina-Czechowice area was taken in the 40's and 50's when gas fields have been discovered in Pogórz, Dębowiec Śląski and Marklowice. Slight increase of exploration activity in 2003 caused the Kowale field discovery, where the hydrocarbon accumulations have been documented in two horizons between 382 and 395 m MD.

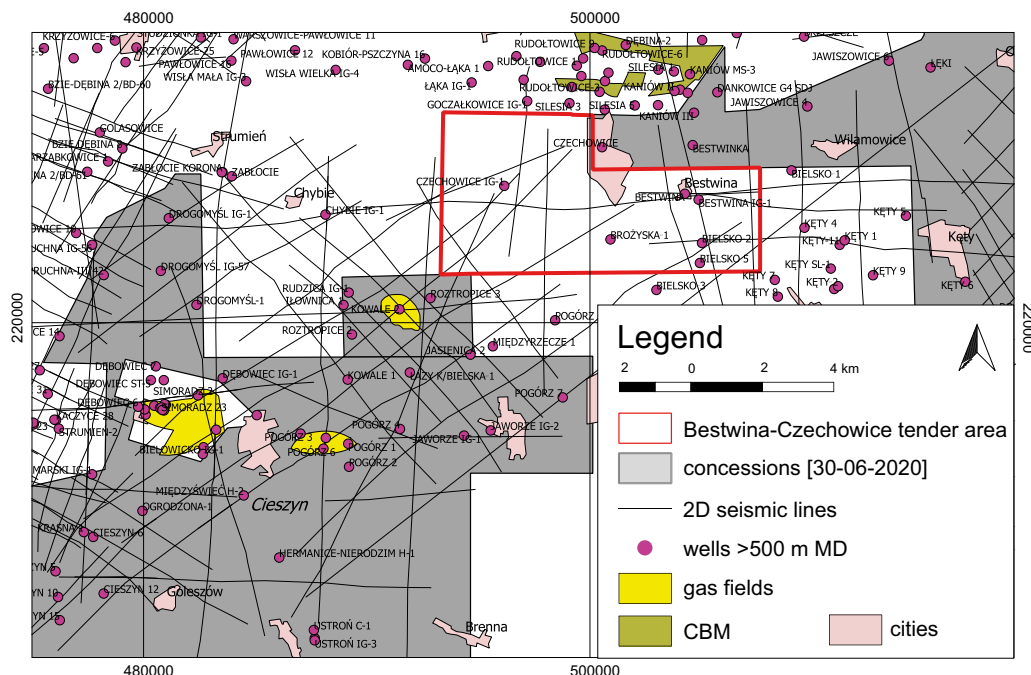
The biogenic gas system (called by the USGS the shallow biogenic gas system) developed in the Miocene of the Carpathian Foredeep is one of two active petroleum plays, which have been identified in the tender area. Multilayer conventional gas fields are related to this system. Also, the so-called hybrid gas fields (concurrence of conventional and tight types of accumulations) can occur as well. The second petroleum system is related to the Paleozoic basement of the Carpathians and Carpathian Foredeep. The main source

rocks are coal-rich layers in the Carboniferous, while traps occur within the Carboniferous clastic intervals and in the lower part of the overlying Miocene. The Silesia, Kaczyce and Marklowice gas fields in the vicinity are related to this system.

Seven deep wells reach the Carboniferous in the Bestwina-Czechowice tender area. Also, numerous wells penetrated the Miocene of the Carpathian Foredeep. The irregular 2D seismic survey has been performed with a 1–1.5 km gap between the sections in the western part of the tender area. The eastern part is documented by 7 seismic profiles done in 1976-1991. In total, 18 lines of 2D seismic of a total length of 388.36 km and no 3D seismic survey have been performed so far.

In the Bestwina-Czechowice tender area, there is still a lot of perspective objects identified on the 2D seismic survey, which were not drilled out. Commercial gas production in the vicinity and numerous oil and gas shows recorded in the wells indicate the prolific nature of the area.

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1. TENDER AREA

BESTWINA-CZECHOWICE

Concession type:

prospecting and exploration of hydrocarbon deposits and production of hydrocarbons from deposits

Type of deposits:

conventional for gas, unconventional/hybrid for gas

Structural stages:

Alpine/Saawian and Styrian stages
(Carpathians and Carpathian Foredeep)
Variscan
(Devonian and Carboniferous basement of the Carpathian units; Lower Paleozoic of the Upper Silesian Block)
Precambrian

Petroleum plays:

I – autochthonous Miocene of the Carpathian Foredeep
II – Paleozoic basement of the Carpathians

Source rocks:

I – claystones and mudstones of the Skawina Formation of the Carpathian Foredeep
II – fine-grained clastic rocks of the Upper Carboniferous (paralic and limnic series) of the Carpathian basement

Reservoir rocks:

I – conglomerates, sandstones, sands and mudstones of the Dębowiec and Skawina formations of the Carpathian Foredeep
II – Lower Devonian sandstones, Middle and Upper Devonian and Lower Carboniferous limestones and dolomites, sandstones and mudstones of paralic and limnic series of the Upper Carboniferous and coal beds of the Carpathian basement

Seal rocks:

I – numerous layers of claystones within the autochthonous Miocene of the Carpathian Foredeep, flysch deposits of the Subsilesian or Silesian units
II – fine-grained clastic rocks of the autochthonous Miocene of the Carpathian Foredeep, claystones and mudstones of the Subsilesia and Silesia flysch successions, fine-grained clastic rocks of the Upper Carboniferous paralic and limnic series

Trap types:

I – structural-lithological
II – structural, lithological, CBM

Thickness of overburden:

I – 200–600 m
II – 400–1,000 m

Key wells (MD):

Bestwina IG-1 (1,572.6 m), Bielsko 1 (1,203.0 m), Bielsko 2 (1,362.2 m), Bielsko 5 (1,700.7 m), Brożyska 1 (1,208.5 m), Czechowice R-1 (1,109.0 m), Czechowice IG-1 (1,511.0 m)

Complete seismic surveys (owner):

1978-1984: 6 lines GZW 2D (State Treasury)
1990-1991: 12 lines Cieszyn-Andrychów 2D (PGNiG S.A.)

Oil and gas deposits in the vicinity (G – gas; O – oil):

Kowale (G) – documented in 2009; balance resources in 2019 – 79.27 mln m³; production in 2019 – 1.91 mln m³

Pogórz (G) – documented in 1958; balance resources in 2019 – 11.70 mln m³; production in 2019 – 0.10 mln m³

Dębowiec Śląski (G) – documented in 1955; balance resources in 2019 – 25.84 mln m³; production in 2019 – 1.69 mln m³

Minimum work program of prospecting and exploration phase:

Stage I (12 months) – reprocessing and reinterpretation of archival geological data

Stage II (48 months) – execution of 30 km 2D seismic survey or 15 km² 3D seismic survey; drilling of one well to the depth of 2,500 m (TVD) with obligatory coring of prospective intervals

2. TENDER AREA KRÓLÓWKA

4TH TENDER
ROUND



ACREAGE: 188.75 km²
46,641 ACRES

Location: onshore; in the areas of the following counties and communes: Małopolskie province, Bochnia county, communes: Bochnia (25.78% of the area), urban Bochnia (6.96%), Drwinia (1.59%), Nowy Wiśnicz (8.57%), Łapanów (22.89%), Trzciana (0.12%); Myślenice county, commune: Raciechowice (6.47%); Wieliczka county, communes: Gdów (27.34%), Kłaj (0.29%).

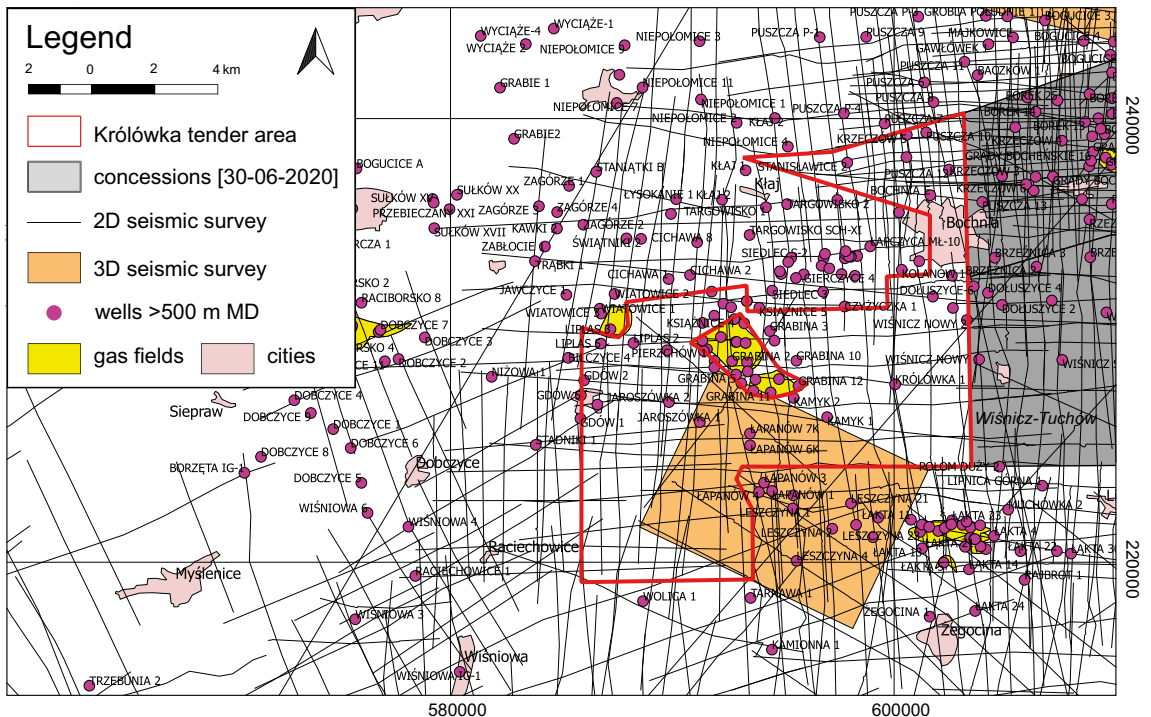
The hydrocarbon potential of the Królówka tender area is confirmed by numerous hydrocarbon deposits discovered in the Miocene of the Carpathian Foredeep and in the Carpathian basement in the close neighborhood. At least three conventional petroleum systems occur in the area.

The first and the shallowest system is developed in the Cretaceous-Paleogene flysch deposits of the Outer Carpathians. The second system is related to the biogenic gas generated during sedimentation and accumulated in fine- and coarse-grained clastic deposits in the Miocene of the Carpathian Foredeep, favoring the formation of multi-horizontal stratigraphic traps. The last petroleum system occurs in the Carpathian basement, at depths between 500 and 1,000 m. Apart from the Jurassic, high porosity was observed in the Cambrian sandstones and Middle to Upper Devonian and Carboniferous carbonates, while the fine-grained Silurian clastics, Middle and Upper Devonian Carbonates and Lower Carboniferous clastics are supposed to be the effective source rocks. The migration

of the gases from the neighboring areas should also be considered in this case.

Fifty-two deep wells reached the Carpathian basement in the Królówka tender area. The Miocene of the Carpathian Foredeep has been drilled out in additional 14 wells. The 2D seismic survey includes 101 lines of a total length of 1437.18 km. One 3D seismic survey has been performed.

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2. TENDER AREA KRÓLÓWKA

4TH TENDER
ROUND

Concession type:

prospecting and exploration of hydrocarbon deposits and production of hydrocarbons from deposits

Type of deposits:

conventional for oil and gas

Structural stages:

Alpine/Saawian and Styrian stages
(Carpathians and Carpathian Foredeep)
Laramian
(Permian and Mesozoic of the Carpathian basement)
Variscan
(Devonian and Carboniferous basement of the Carpathian units; Lower Paleozoic of the Upper Silesian Block)
Caledonian
(Lower Paleozoic of the Małopolska Block)
Precambrian

Petroleum plays:

I – Carpathians
II – autochthonous Miocene of the Carpathian Foredeep
III – Paleozoic-Mesozoic basement of the Carpathians

Source rocks:

I – Menilite, Cieszyn, Verovice, Grodziszczce and Lgota beds of the Carpathians
II – siltstones and claystones of the Badenian and Sarmatian of the Carpathian Foredeep
III – fine-grained Silurian clastics, Middle and Upper Devonian carbonates, Lower Carboniferous (Kulm) clastics of the Paleozoic-Mesozoic basement of the Carpathian units

Reservoir rocks:

I – Istebna and Ciężkowice sandstones of the Carpathians
II – sandstones and siltstones of the Badenian and Sarmatian of the Carpathian Foredeep
III – Precambrian sandstones (hypothetical), Middle and Upper Devonian and Lower Carboniferous carbonates, Upper Jurassic carbonates of the Carpathian basement

Seal rocks:

I – fine-grained flysch of the Carpathians
II – Miocene fine-grained clastics of the Carpathian Foredeep and fine-grained flysch of the Carpathians
III – Miocene fine-grained clastics of the Carpathian Foredeep

Trap types:

I, II, III – structural, lithological, mixed

Thickness of overburden:

I – 0–100 m
II – 0–880 m
III – 722–1,938 m

Key wells (MD):

Dotuszyce 1 (1,485.3 m), Grabina 12 (1,654.0 m), Królówka 1 (1,802.0 m), Liplas 2 (2,942.8 m), Krzczów 2 (961.0 m), Stanisławice 2 (1,002.0 m), Wiśnicz Nowy 2 (1,607.0 m)

Complete seismic surveys (owner):

1974: 1 line Myślenice-Sucha-Rabka 2D (State Treasury)
1975: 3 lines Sucha-Rabka-Nowy Targ 2D (State Treasury)
1976: 2 lines Brzesko-Pilzno-Olszyny 2D (State Treasury)
1978: 3 lines Bochnia-Czchów-Pilzno 2D (State Treasury)
1978: 3 lines Żywiec-Wadowice-Gdów 2D (State Treasury)
1984-1986: 7 lines Wiśniowa-Łąka 2D (State Treasury)
1987-1988: 10 lines Niepołomice-Gdów 2D (State Treasury)
1989: 4 lines Dobczyce-Gdów-Wolica 2D (PGNiG S.A.)
1989: 3 lines Niepołomice-Gdów-Myślenice 2D (PGNiG S.A.)
1991-1992: 10 lines Dobczyce-Gdów-Wolica 2D (PGNiG S.A.)
1992: 2 lines Myślenice-Limanowa-Czchów 2D (PGNiG S.A.)
1993: 6 lines Liplas-Grobla-Żukowice 2D (PGNiG S.A.)
1993: 5 lines Liplas-Puszcza 2D (PGNiG S.A.)
2001-2002: 6 lines Stadniki 2D (PGNiG S.A., State Treasury)
2003: 13 lines Puszcza-Krzczów-Borek 2D (State Treasury)
2004: 15 lines Kamyk-Niepołomice 2D (State Treasury)
2004: 1 line Krzczów-Rajsko-3C 2D (State Treasury)
2005: 2 lines Wiśnicz 2D (State Treasury)
2007: 5 lines Tarnawa-Czchów 2D (State Treasury)

Oil and gas deposits in the vicinity (G – gas; O – oil):

Dąbrówka (G) – documented in 1976; balance resources in 2019 – 26.37 mln m³; production in 2019 – 0.00 mln m³

Grabina-Nieznanowice (G) – documented in 1971; balance resources in 2019 – 320.41 mln m³; production in 2019 – 1.91 mln m³

Grabina-Nieznanowice S (G) – documented in 1987; balance resources in 2019 – 205.43 mln m³; production in 2019 – 0.03 mln m³

Łapanów (G) – documented in 2008; balance resources in 2019 – 274.23 mln m³; production in 2019 – 5.15 mln m³

Łąka (G+O) – documented in 1971; balance resources in 2019 – 199.60 mln m³ of natural gas and 4.58 kt of condensate; production in 2019 – 2.56 mln m³ of natural gas and 0.00 kt of condensate

Minimum work program of prospecting and exploration phase:

Stage I (12 months) – reprocessing and reinterpretation of archival geological data

Stage II (48 months) – drilling of two wells to the depth of 4,500 m (TVD) with obligatory coring of prospective intervals

3. TENDER AREA PYRZYCE



**ACREAGE: 1,171.72 km²
289,538 ACRES**

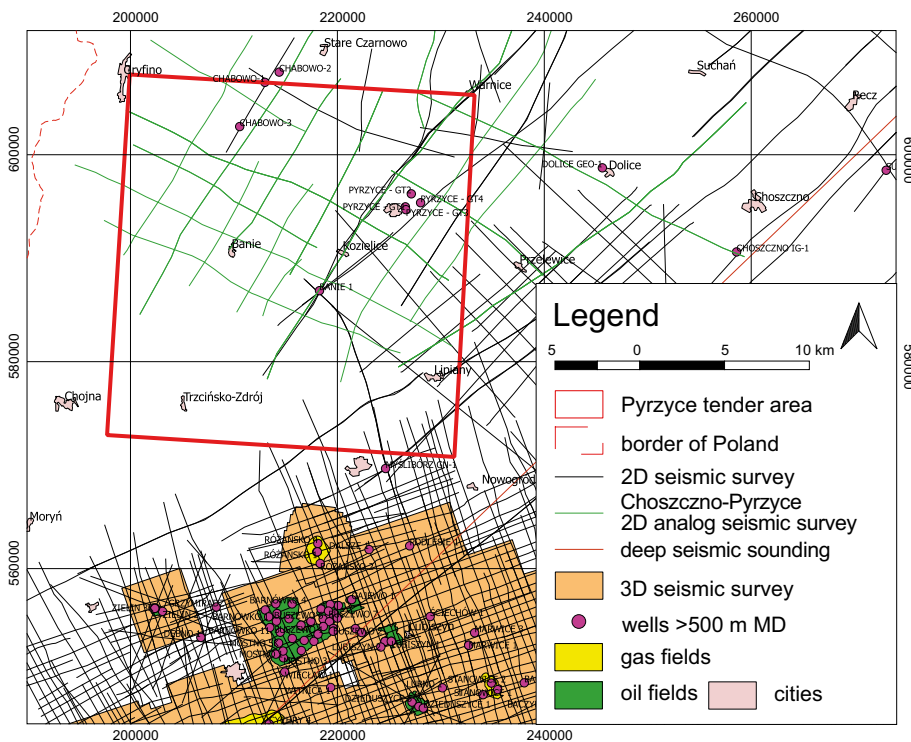
Location: onshore; in the areas of the following counties and communes: Zachodniopomorskie province, Gryfino county, communes: Stare Czarnowo (0.32% of the area), Widuchowa (4.65%), Chojna (4.80%), Trzcińsko-Zdrój (6.34%), Gryfino (10.24%), Banie (17.62%); Myślibórz county, communes: Nowogródek Pomorski (0.33%), Myślibórz (14.99%); Pyrzyce county, communes: Przelevice (<0.01%), Warnice (3.75%), Lipiany (6.06%), Bielice (6.58%), Kozielice (8.07%), Pyrzyce (16.19%); Stargard county, commune: Stargard (0.06%).

The hydrocarbon prospects in the Pyrzyce tender area are mainly associated with conventional petroleum system developed in the Main Dolomite (Ca₂) of the Zechstein (Upper Permian). Both – source and reservoir rocks occur within and accumulations of oil and gas are expected. The undiscovered potential for natural gas in the Rotliegend (Lower Permian) sandstones is also suggested, as the gas shows have been observed in the wells therein. However, there are still no commercial discoveries in this interval in the neighborhood, so far. Numerous discoveries in the Main Dolomite occur in the southern neighborhood of the Pyrzyce tender area. One of them is the largest oil and gas field in Poland – Barnówko-Mostno-Buszewo (BMB, PGNiG S.A.). This and the others are mostly related to a large carbonate platform and slope deposits. However, in the Pyrzyce, as an area located basinward and beyond the main carbonate shelf, the Main Dolomite traps are expected as developed in small, isolated carbonate platforms. The Zielin field in the vicinity is an example of this kind of oil accumulations. The secondary

exploration target is associated with the Rotliegend alluvial fans developed around the Wolsztyn High. Unfortunately, there is only one well reaching the Rotliegend in the Pyrzyce tender area (Banie 1). However, natural gas flows have been noted within.

Only one deep well reaches the Permian in the Pyrzyce tender area. However, another 14 wells are located in the close neighborhood. The seismic survey includes 28 lines (2D) of a total length of 287.8 km (mostly from the 1970s and 1980s in analogue format). The most recent seismic data was collected in 2011 by FX Energy. No 3D seismic survey has been performed, so far.

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3. TENDER AREA PYRZYCE

4TH TENDER
ROUND

Concession type:

prospecting and exploration of hydrocarbon deposits and production of hydrocarbons from deposits

Type of deposits:

conventional for oil and gas

Structural stages:

Laramian

(Permian and Mesozoic)

Variscan

(Devonian and Carboniferous of the Variscan Externides)

Petroleum plays:

I – Zechstein/Main Dolomite

II – Carboniferous–Lower Permian/Rotliegend

Source rocks:

I – organic-rich interbeds within the Zechstein/Main Dolomite

II – Lower Carboniferous claystones and mudstones, hypothetically Upper Carboniferous clastic rocks (Westphalian paralic series)

Reservoir rocks:

I – Zechstein/Main Dolomite carbonates

II – Rotliegend and possibly Weissliegend sandstones

Seal rocks:

I, II – Zechstein evaporites

Trap types:

I, II – structural, lithological, mixed

Thickness of overburden:

I – 3,628–4,603 m

II – 3,906–4,766 m

Key wells (MD):

Banie 1 (4,090.0 m), Chabowo 1 (2,708.0 m), Cychry 1 (3,076.0 m), Myślubórz GN 1 (3,893.0 m), Różańsko 1 (3,253.0 m), Różańsko 1A (3,198.0 m), Różańsko 2 (3,305.0 m), Różańsko 3K (3,201.0 m), Różańsko 4 (3,201.5 m), Stargard 1 (5,444.0 m), Zielin 1 (3,343.0 m), Zielin 2 (3,442.0 m), Zielin 3 (3,342.0 m), Zielin 3K (3,331.1 m), Zielin 3K BIS (3,256.9 m)

Complete seismic surveys (owner):

1978-1979: 6 lines Myślubórz-Krzyż 2D (State Treasury)

1986: 2 lines Chociwel-Czaplinek 2D (State Treasury)

1989-1990: 8 lines Marianowo 2D (State Treasury)

1995: 1 line Gorzów Wielkopolski-Lubniewice 2D (PGNiG S.A.)

1996: 2 lines Myślubórz-Karsko-Golin 2D (PGNiG S.A.)

2003: 2 lines Gorzów Wlkp.-Myślubórz 2D (State Treasury)

2011: 7 lines Płońsko 2D (State Treasury)

Oil and gas deposits in the vicinity (G – gas; O – oil):

Różańsko (G) – documented in 1995; balance resources in 2019 – 2,231.52 mln m³; production in 2019 – 0.00 mln m³

Barnówko-Mostno-Buszewo (G+O) – documented in 1996; balance resources in 2019 – 1,858.17 mln m³ of natural gas and 5,587.68 kt of oil; production in 2019 – 439.68 mln m³ of natural gas and 315.62 kt of oil

Gajewo (G+O) – documented in 2011; balance resources in 2019 – 8.84 mln m³ of natural gas and 22.38 kt of oil; production in 2019 – 2.08 mln m³ of natural gas and 6.66 kt of oil

Lubiszyn (G+O) – documented in 1999; balance resources in 2019 – 0.37 mln m³ of natural gas and 1.96 kt of oil; production in 2019 – 1.34 mln m³ of natural gas and 4.28 kt of oil

Zielin (G+O) – documented in 1995; balance resources in 2019 – 21.39 mln m³ of natural gas and 2.36 kt of oil; production in 2019 – 11.67 mln m³ of natural gas and 1.28 kt of oil

Minimum work program of prospecting and exploration phase:

Stage I (12 months) – reprocessing and reinterpretation of archival geological data

Stage II (48 months) – execution of 50 km 2D seismic survey or 25 km² 3D seismic survey; drilling of one well to the depth of 4,200 m (TVD) with obligatory coring of prospective intervals

4. TENDER AREA ZŁOCZEW

4TH TENDER
ROUND



**ACREAGE: 702.48 km²
173,586 ACRES**

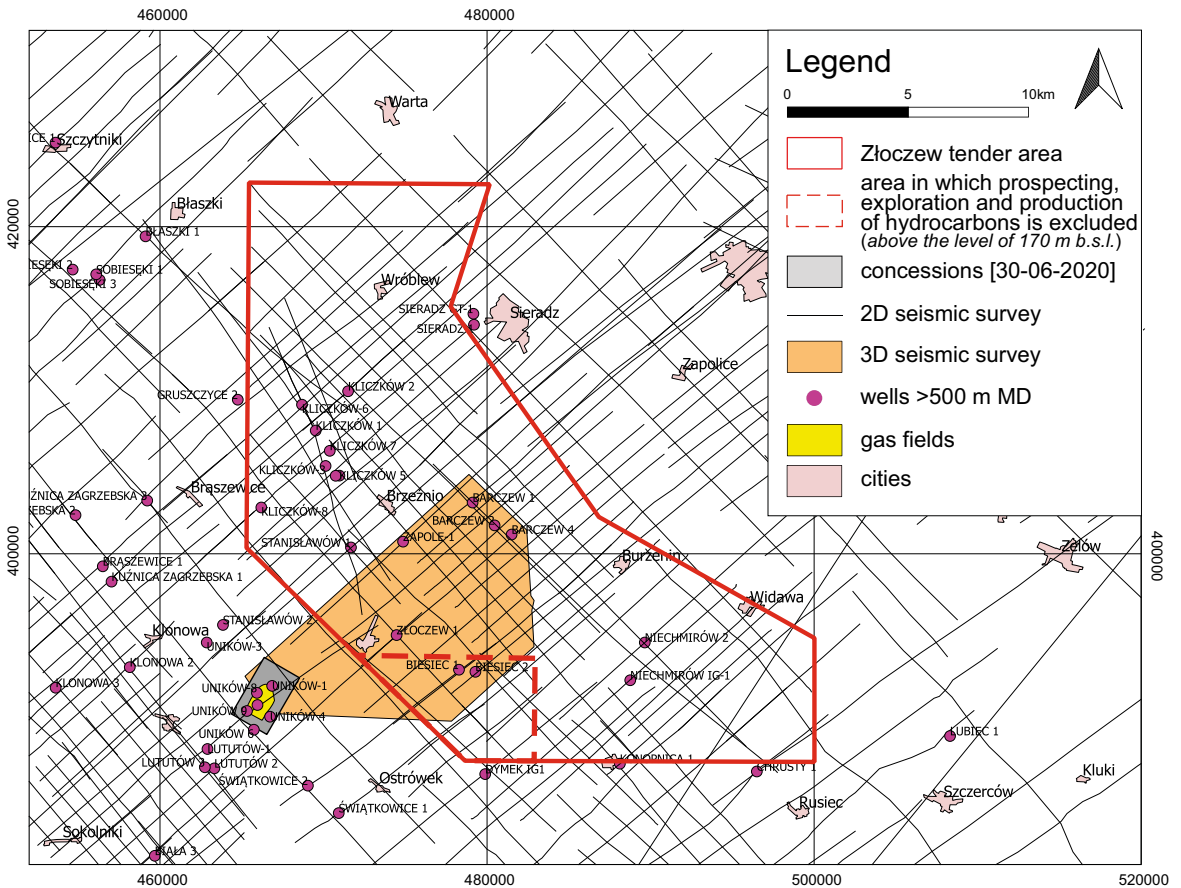
Location: onshore; in the areas of the following counties and communes: łódzkie province, Bełchatów county, commune: Rusiec (0.55% of the area); łask county, commune: Widawa (14.53%); Sieradz county, communes: Błaszki (2.63%), Brąszewice (2.88%), Brzeźnio (18.29%), Burzenin (14.71%), urban Sieradz (1.29%), Sieradz (9.63%), Warta (2.20%), Wróblew (16.05%), Złoczew (10.39%); Wieluń county, communes: Konopnica (6.75%), Ostrówek (0.10%).

The hydrocarbon prospects in the Złoczew tender area are related to two petroleum systems. The first includes the reservoir horizons developed in fractured carbonates of the top of the Carboniferous, Rotliegend aeolian sandstones and Zechstein Limestone carbonates. The second is developed in the Zechstein/Main Dolomite. The source rocks – Lower Carboniferous fine-clastics – have been recognized in numerous wells. They have low TOC, while maturity is irregular and quite low in some places (gas and oil shows or dead oil encountered), as an effect of complicated tectonic history. The role of the Lower Carboniferous clastic rocks as potential reservoirs is possible only when fractured (their primary porosity and permeability equal around zero). Reservoir properties of the Rotliegend sandstones vary

in terms of porosity and permeability. Gas accumulations can be encountered mainly in structural and stratigraphic or mixed traps. They are sealed by the Zechstein evaporites. In the Main Dolomite, two hydrocarbon accumulations have been discovered in the southern neighborhood of the Złoczew tender area. These are Uników and Gomunice fields.

Twenty-two deep wells reach the prospective horizons in the Złoczew tender area and in its close vicinity. The seismic survey includes 77 lines (2D) of a total length of 1038.8 km. Also 119.8 km² of the 3D seismic survey has been performed, so far.

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4. TENDER AREA ZŁOCZEW

Concession type:

prospecting and exploration of hydrocarbon deposits and production of hydrocarbons from deposits

Type of deposits:

conventional for gas

Structural stages:

Laramian
(Permian and Mesozoic)
Variscan
(Devonian and Carboniferous of the Variscan Externides)

Petroleum plays:

I – Zechstein/Main Dolomite
II – Carboniferous–Lower Permian/Rotliegend

Source rocks:

I – organic-rich interbeds within the Zechstein/Main Dolomite
II – Carboniferous claystones and mudstones

Reservoir rocks:

I – Zechstein/Main Dolomite carbonates
II – Carboniferous and Rotliegend sandstones, Zechstein Limestone

Seal rocks:

I, II – Zechstein evaporites

Trap types:

I, II – structural, lithological, mixed

Thickness of overburden:

I – 2,411–3,168 m
II – 2,657–3,247 m

Key wells (MD):

Barczew 1 (3,220.0 m), Barczew 2 (2,691.8 m), Barczew 4 (2,908.8 m), Biesiec 1 (3,023.0 m), Biesiec 2 (2,987.0 m), Chrusty 1 (3,571.4 m), Dymek IG-1 (2,797.0 m), Kliczków 1 (2,979.0 m), Kliczków 2 (3,368.7 m), Kliczków 3 (2,634.0 m), Kliczków 5a (3,204.0 m), Kliczków 6 (3,353.0 m), Kliczków 7 (3,201.0 m), Kliczków 8 (2,951.3 m), Konopnica 1 (2,960.0 m), Masanów 1 (2,631.0 m), Niechmirów IG-1 (2,892.0 m), Niechmirów 2 (3,587.0 m), Prosna 1 (2,300.0 m), Stanisławów 1 (3,162.0 m), Zapole 1 (2,878.8 m), Złoczew 1 (2,980.0 m)

Complete seismic surveys (owner):

1972: 1 line Kalisz-Iwanowice 2D (State Treasury)
1972: 1 line Zduńska Wola-Szczerców 2D (State Treasury)
1975: 2 lines Kalisz-Turek-Sieradz 2D (State Treasury)
1976-1977: 27 lines Ostrów K.-Bełchatów 2D (State Treasury)
1976: 4 lines Sieradz-Piotrków Trybunalski 2D (State Treasury)
1981: 1 line Kalisz-Ostrzeszów-Złoczew 2D (State Treasury)
1981-1983: 7 lines Szczerców-Piotrków T. 2D (State Treasury)
1982: 1 line Błaszki 2D (State Treasury)
1983: 6 lines Uników-Złoczew 2D (State Treasury)
1996: 1 line Zduńska Wola 2D (TEXACO)
2005: 120 km² Złoczew Zachód 3D (State Treasury)
2013: 17 lines Sieradz-Łódź 2D (State Treasury)
2015: 9 lines Barczew 2D (State Treasury)

Oil and gas deposits in the vicinity (G – gas; O – oil):

Gomunice (O) – documented in 1987; balance resources in 2019 – 39.73 kt; production in 2019 – 0.00 kt

Uników (G) – documented in 1973; balance resources in 2019 – 170.00 mln m³; production in 2019 – 0.00 mln m³

Minimum work program of prospecting and exploration phase:

Stage I (12 months) – reprocessing and reinterpretation of archival geological data

Stage II (48 months) – execution of 200 km 2D seismic survey or 100 km² 3D seismic survey; drilling of one well to the depth of 3,500 m (TVD) with obligatory coring of prospective intervals

5. TENDER AREA ŻABOWO

4TH TENDER
ROUND



**ACREAGE: 990.32 km²
244,713 ACRES**

Location: onshore; in the areas of the following counties and communes: Zachodniopomorskie province, Goleniów county, communes: Maszewo (0.11% of the area), Nowogard (28.47%), Osina (2.45%); Gryfice county, communes: Gryfice (8.06%), Płoty (19.19%); Kamieński county, commune: Golczewo (4.41%); Łobez county, communes: Dobra (1.52%), Łobez (0.06%), Radowo Małe (15.49%), Resko (19.41%), Węgorzyno (0.83%).

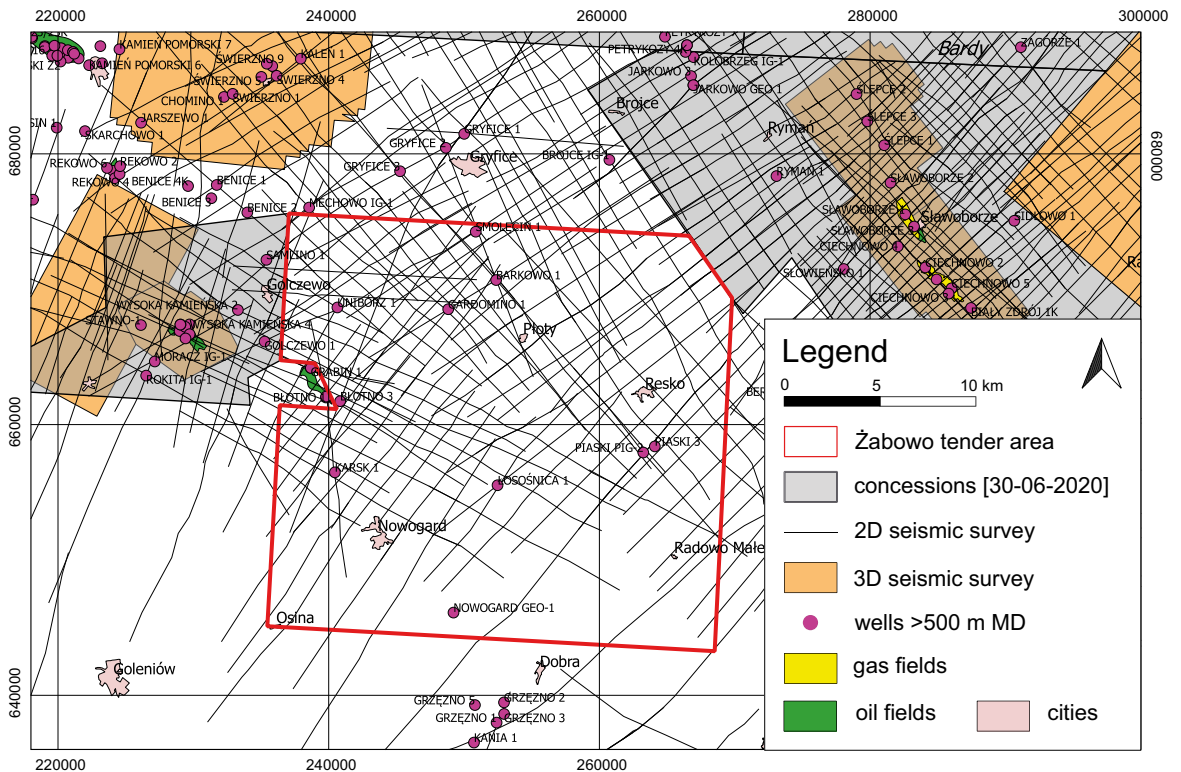
The Żabowo tender area is located in the Western Petroleum Province. The hydrocarbon prospects are related here to two petroleum systems. In the first one, the Carboniferous fine-clastics are regarded as source rocks, while Rotliegend sandstones form the main reservoir horizon. The second system is related to the Zechstein/Main Dolomite, in which carbonate layers are reservoirs, while organic-rich interbeds are considered as source rocks. The Zechstein evaporites with salts and clay deposits form regional seal. Structural and tectonic traps can be expected in both systems. Also, lithological and mixed traps could occur in the southern part of the area.

In the close vicinity of the Żabowo tender area, numerous oil deposits in the Zechstein/Main Dolomite have been discovered in Błotno, Sławoborze, Wysoka Kamieńska and Rekowo. Natural gas deposits in the Rotliegend sandstones

occur in Ciechnowo and Sławoborze. Also new gas field in Siemidarżno has been documented in 2016 in the close neighborhood.

Fourteen deep wells reach the prospective horizons in the Żabowo tender area and in its neighborhood. The seismic survey includes 99 lines (2D) of a total length of 1,370.0 km. No 3D seismic survey has been performed, so far.

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5. TENDER AREA ZABOWO

4TH TENDER
ROUND

Concession type:

prospecting and exploration of hydrocarbon deposits and production of hydrocarbons from deposits

Type of deposits:

conventional for gas

Structural stages:

Laramian
(Permian and Mesozoic)
Variscan
(Devonian and Carboniferous of the Variscan foreland)
Caledonian
(Lower Paleozoic basement)

Petroleum plays:

I – Zechstein/Main Dolomite
II – Carboniferous–Lower Permian/Rotliegend

Source rocks:

I – organic-rich interbeds within the Zechstein/Main Dolomite
II – Carboniferous clastones and mudstones

Reservoir rocks:

I – Zechstein/Main Dolomite carbonates
II – Carboniferous and Rotliegend sandstones

Seal rocks:

I, II – Zechstein evaporites, Triassic claystones

Trap types:

I, II – structural, lithological, mixed

Thickness of overburden:

I – 2,930–3,588 m
II – 3,324–3,927 m

Key wells (MD):

Piaski PIG-2 (3,922.0 m)

Complete seismic surveys (owner):

1976: 1 line Gorzysław-Petrykozy 2D (State Treasury)
1976: 2 lines Wysoka Kamieńska 2D (State Treasury)
1979-1981: 38 lines W. Kamieńska-Błotno 2D (State Treasury)
1979-1983: 7 lines Wolin-Gostyń-Błotno 2D (State Treasury)
1979-1983: 11 lines Gryfice-Trzebiatów 2D (State Treasury)
1980: 5 lines Nowogard-Resko 2D (State Treasury)
1983-1984: 9 lines Nowogard-Resko 2D (State Treasury)
2000: 2 lines Gryfice 2D (PGNiG S.A.)
2002: 15 lines Piaski-Resko 2D (State Treasury)
2006: 9 lines Rybokarty-Komorowo (State Treasury)

Oil and gas deposits in the vicinity (G – gas; O – oil):

Ciechnowo (G) – documented in 1995; balance resources in 2019 – 2.23 mln m³; production in 2019 – 6.47 mln m³

Sławoborze (G) – documented in 2009; balance resources in 2019 – 47.83 mln m³; production in 2019 – 4.74 mln m³

Sławoborze (O+G) – documented in 2005; balance resources in 2019 – 4.15 kt of oil and 1.37 mln m³ of natural gas; production in 2019 – 0.13 kt of oil and 0.04 mln m³ of natural gas

Błotno (O+G) – documented in 1985; balance resources in 2019 – 7.54 kt of oil and 1.88 mln m³ of natural gas; production in 2019 – 0.36 kt of oil and 0.04 mln m³ of natural gas

Rekowo (O+G) – documented in 1994; balance resources in 2019 – 1.37 kt of oil and 0.27 mln m³ of natural gas; production in 2019 – 0.00 kt of oil and 0.00 mln m³ of natural gas

Wysoka Kamieńska (O+G) – documented in 1980; balance resources in 2019 – 8.39 kt of oil and 2.19 mln m³ of natural gas; production in 2019 – 3.90 kt of oil and 0.28 mln m³ of natural gas

Minimum work program of prospecting and exploration phase:

Stage I (12 months) – reprocessing and reinterpretation of archival geological data

Stage II (48 months) – execution of 90 km 2D seismic survey or 45 km² 3D seismic survey; drilling of one well to the depth of 6,000 m (TVD) with obligatory coring of prospective intervals





5TH TENDER
ROUND
2021

4 AREAS

1. TENDER AREA GRYFICE

5TH TENDER
ROUND



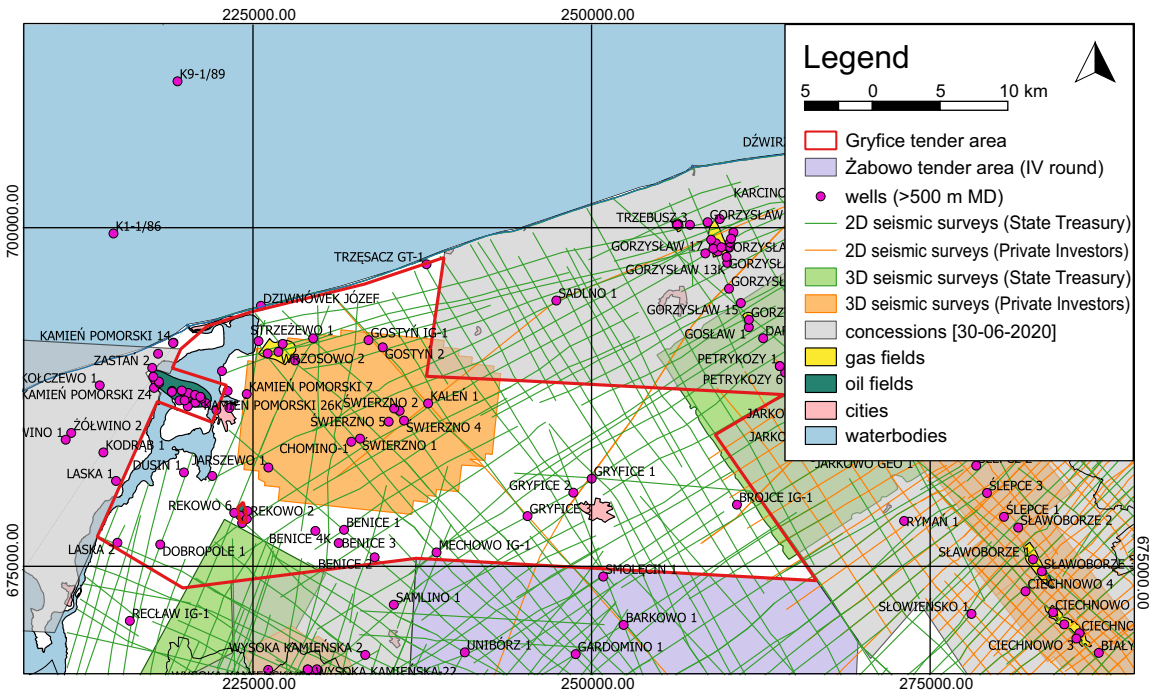
ACREAGE: 747.58 km²
184,731 ACRES

Location: onshore; in the areas of the following counties and communes: Zachodniopomorskie province, Gryfice county, communes: Brojce (6.60% of the area), Gryfice (24.17%), Karnice (5.60%), Płoty (4.78%), Rewal (1.67%), Trzebiatów (0.75%); Kamień Pomorski county, communes: Dziwnów (3.11%), Golczewo (3.09%), Kamień Pomorski (26.39%), Świerzno (18.72%), Wolin (5.12%).

The Gryfice tender area is located in the Western Petroleum Province. The main exploration target here is related to the Main Dolomite carbonate rocks, in which conventional accumulations of oil and gas are expected. The additional targets are Rotliegend and Carboniferous sandstones, in which conventional traps for gas are supposed to occur. Sixteen oil and gas fields are documented in the Gryfice area and in its close neighborhood, proving high potential for further discoveries.

Thirty-eight deep wells (>500 m MD) deep wells reach the prospective horizons in the Gryfice tender area. The seismic survey includes 116 lines (2D) of a total length of 1,035.7 km. Three 3D seismic survey have been performed, so far.

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1. TENDER AREA GRYFICE

5TH TENDER
ROUND

Concession type:

prospecting and exploration of hydrocarbon deposits and production of hydrocarbons from deposits

Type of deposits:

conventional for oil and gas

Structural stages:

Cenozoic

Laramian (Permian and Mesozoic)

Variscan (Devonian and Carboniferous)

Caledonian (Lower Paleozoic)

Petroleum plays:

I – Zechstein/Main Dolomite

II – Carboniferous/Westphalian-Permian/Rotliegend

Source rocks:

I – organic-rich interbeds within the Zechstein/Main Dolomite

II – Carboniferous clstones and mudstones

Reservoir rocks:

I – Zechstein/Main Dolomite carbonates

II – Carboniferous (Westphalian) sandstones and sandy-conglomerates; Permian/Upper Rotliegend alluvial sandstones and marginal playa-lake fine-grained sandstones

Seal rocks:

I – Zechstein evaporites PZ2

II – Zechstein evaporites PZ1

Trap types:

I – stratigraphic, structural, mixed

II – stratigraphic, structural, mixed

Thickness of overburden:

I – 2,326.5–3,235.0 m

II – 2,658.5–3,609.5 m

Key wells (MD):

Benice 1 (3,247.0 m), Benice 2 (2,916.0 m), Benice 3 (2,842.0 m), Benice 4K (2,732.5 m), Brojce IG-1 (4,252.0 m), Chomino-1 (2,750.0 m), Dobropole 1 (2,883.0 m), Dusin 1 (2,662.5 m), Gostyń 2 (3,447.0 m), Gostyń IG-1 (2,133.4 m), Gryfice 1 (3,367.0 m), Gryfice 2 (3,415.0 m), Gryfice 3 (3,190.0 m), Jarszewo 1 (2,998.7 m), Kaleń 1 (3,232.0 m), Kamień Pomorski 3 (2,405.0 m), Kam. Pomorski 7 (3,410.0 m), Kam. Pomorski 13 (2,672.0 m), Laska 2 (3,583.0 m), Mechowo IG-1 (1,347.0 m), Rekowo 2 (3,141.5 m), Rekowo 3 (2,697.0 m), Rekowo 4 (2,736.0 m), Rekowo 6 (2,746.0 m), Skarchowo 1 (2,667.0 m), Strzeżewo 1 (4,521.0 m), Świerzno 1 (3,103.0 m), Świerzno 2 (2,772.2 m), Świerzno 4 (3,238.5 m), Świerzno 5 (2,883.6 m), Świerzno 9 (2,774.7 m), Trzęsacz GT-1 (1,224.5 m), Wrzosowo 1 (3,305.0 m), Wrzosowo 2 (3,127.3 m), Wrzosowo 3 (3,255.0 m), Wrzosowo 8 (3,310.0 m), Wrzosowo 9 (3,198.0 m)

Complete seismic surveys (owner):

1976: 8 lines Gorzysław-Petrykozy 2D (State Treasury)

1976: 2 lines Wysoka Kamieńska 2D (State Treasury)

1979-1983: 75 lines W. Kam.-Białogard 2D (State Treasury)

1979-1983: 7 lines Wolin-Gostyń-Błotno 2D (State Treasury)

1979-1983: 11 lines Gryfice-Trzebiatów 2D (State Treasury)

1996-1997: 11 lines Jarkowo-Piaski 2D (St. Treas., PGNIG S.A.)

1999-2000: 5 lines Kamień Pomorski-Gryfice 2D (PGNIG S.A.)

2002: 2 lines Piaski-Resko 2D (State Treasury)

2006: 13 lines Rybokarty-Komorowo 2D (State Treasury)

1997: Świerzno 3D (PGNIG S.A.)

2018: Jarkowo 3D (State Treasury)

2018: Moracz 3D (State Treasury)

Oil and gas deposits in the vicinity (G – gas; O – oil):

Białogard (G) – documented in 1983; balance resources in 2019 – 23.43 mln m³; production in 2019 – 10.07 mln m³.

Błotno (O+G) – documented in 1985; balance resources in 2019 – 1.88 mln m³ of natural gas and 7.54 kt of oil; production in 2019 – 0.04 mln m³ of natural gas and 0.36 kt of oil.

Ciechnowo (G) – documented in 1995; balance resources in 2019 – 2.23 mln m³; production in 2019 – 6.47 mln m³.

Daszewo (O+G) – documented in 1982; balance resources in 2019 – 27.72 mln m³ of natural gas and 3.86 kt of oil; production in 2019 – 0.00 mln m³ of natural gas and 0.10 kt of oil.

Daszewo N (G) – documented in 1985; balance resources in 2019 – 910.26 mln m³; production in 2019 – 17.94 mln m³.

Gorzysław N+S (G) – documented in 1976; balance resources in 2019 – 687.87 mln m³; production in 2019 – 19.62 mln m³.

Kamień Pomorski (O+G) – documented in 1972; balance resources in 2019 – 8.93 mln m³ of natural gas and 4.24 kt of oil; production in 2019 – 0.21 mln m³ of natural gas and 1.25 kt of oil.

Międzyzdroje E+W (G) – documented in 1972; balance resources in 2019 – 600.00 mln m³; production in 2019 – 0.00 mln m³.

Przytór (G) – documented in 1990; balance resources in 2019 – 360.00 mln m³; production in 2019 – 0.00 mln m³.

Rekowo (O+G) – documented in 1994; balance resources in 2019 – 0.27 mln m³ of natural gas and 1.37 kt of oil; production in 2019 – 0.00 mln m³ of natural gas and 0.00 kt of oil.

Sławoborze (O+G) – documented in 2005; balance resources in 2019 – 47.83 mln m³ of natural gas and 4.15 kt of oil; production in 2019 – 4.74 mln m³ of natural gas and 0.13 kt of oil.

Trzebusz (G) – documented in 1978; balance resources in 2019 – 0.00 mln m³; production in 2019 – 5.75 mln m³.

Wrzosowo (G) – documented in 1975; balance resources in 2019 – 6000.00 mln m³; production in 2019 – 0.00 mln m³.

2. TENDER AREA GORZÓW WIELKOPOLSKI S

5TH TENDER
ROUND



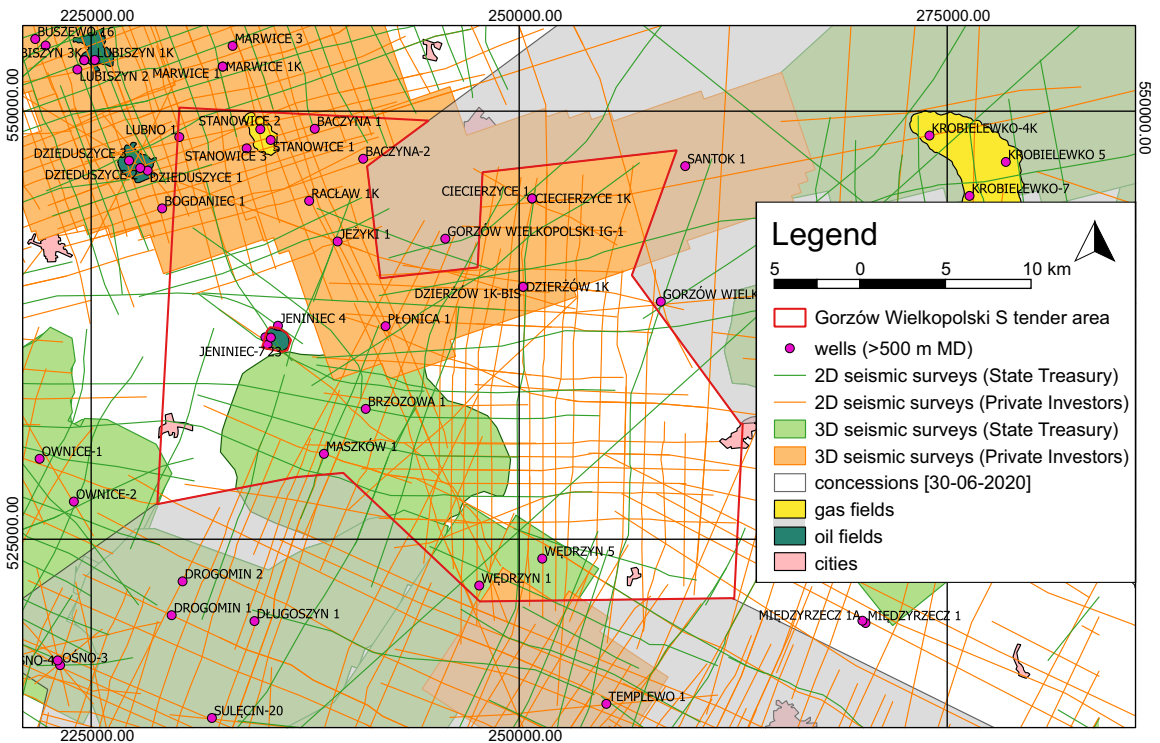
ACREAGE: 692.13 km²
171,029 ACRES

Location: onshore; in the areas of the following counties and communes: Lubuskie province, Gorzów Wlkp. county, communes: Bogdaniec (15.46% of the area), Deszczno (22.28%), Lubiszyn (1.61%), Santok (1.73%), Witnica (2.81%); Gorzów Wlkp. city county, commune: Gorzów Wlkp. (3.71%); Międzyrzec county, communes: Bledzew (20.59%), Skwierzyna (6.68%); Sulęcín county, communes: Krzeszyce (16.70%), Lubniewice (8.45%).

The Gorzów Wielkopolski S tender area is located in the Western Petroleum Province. The main exploration target here is related to the Main Dolomite carbonate rocks, in which conventional accumulations of oil and gas are expected. Nine oil and gas fields are documented in the Gorzów Wlkp. S area and in its close neighborhood, proving high potential for further discoveries in the Main Dolomite carbonate rocks.

Eighteen deep wells (>500 m MD) reach the prospective horizons in the Gorzów Wielkopolski S tender area. The seismic survey includes 153 lines (2D) of a total length of 1,573.7 km. Six 3D seismic survey have been performed, so far.

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2. TENDER AREA

GORZÓW WIELKOPOLSKI S

5TH TENDER
ROUND

Concession type:

prospecting and exploration of hydrocarbon deposits and production of hydrocarbons from deposits

Type of deposits:

conventional for oil and gas

Structural stages:

Cenozoic

Laramian (Permian and Mesozoic)

Petroleum plays:

I – Zechstein/Main Dolomite

Source rocks:

I – organic-rich interbeds within the Zechstein/Main Dolomite

Reservoir rocks:

I – Zechstein/Main Dolomite carbonates

Seal rocks:

I – Zechstein evaporites P22

Trap types:

I – structural, lithological, mixed

Thickness of overburden:

I – 2,600–3,200 m

Key wells (MD):

Baczyna 1 (3,204.0 m), Baczyna-2 (3,167.0 m), Brzozowa 1 (3,218.0 m), Ciecierzycze 1 (3,092.0 m), Ciecierzycze 1K (3,006.8 m), Dzierżów 1K (3,031.9 m), Dzierżów 1K-bis (3,034.1 m), Jeniniec 4 (3,290.0 m), Jeżyki 1 (3,401.0 m), Lubno 1 (3,217.0 m), Maszków 1 (3,168.0 m), Płonica 1 (3,353.0 m), Raclaw 1K (3,256.0 m), Stanowice 1 (3,200.0 m), Stanowice 2 (3,200.0 m), Stanowice 3 (3,261.0 m), Wędrzyn 1 (3,170.0 m), Wędrzyn 5 (3,210.0 m)

Complete seismic surveys (owner):

1975: 3 lines Międzyrzec-Nowy Tomyśl 2D (State Treasury)
1976: 2 lines Kostrzyn-Skwierzyna 2D (State Treasury)
1976: 2 lines Skwierzyna-Nowa Sól 2D (State Treasury)
1977: 6 lines Sulęcín-Swiebodzin 2D (State Treasury)
1978: 11 lines Kostrzyn-Gorzów Wlkp. 2D (State Treasury)
1978: 10 lines Myślubórz-Krzyż 2D (State Treasury)
1984: 2 lines Chociwel-Czaplinek 2D (State Treasury)
1987-1993: 24 lines Chojna-Gorzów Wielkopolski-Strzelce Krajeńskie 2D (State Treasury, PGNIG S.A.)

1987: 1 line Kostrzyn 2D (State Treasury)

1992-1993: 2 lines Chojna-Myślubórz-G. Wlkp. 2D (PGNiG S.A.)

1993-1998: 67 lines Dzieduszyce-G. Wlkp. 2D (PGNiG S.A.)

1994-1997: 17 lines Sulęcín-Międzyrzecz 2D (PGNiG S.A.)

1999-2000: 6 lines Międzyrzecz-Międzychód 2D (PGNiG S.A.)

1997: Dzieduszyce-Stanowice 3D (PGNiG S.A.)

2000: Gorzów Wlkp.-Santok 3D (PGNiG S.A.)

2001: Nowa Wieś-Templewo 3D (PGNiG S.A.)

2005: Wędrzyn 3D (State Treasury)

2013: Sulęcín-3D (State Treasury)

2019: Maszków-Bolemin 3D (State Treasury)

Oil and gas deposits in the vicinity (G – gas; O – oil):

BMB (O+G) – documented in 1996; balance resources in 2019 – 1,858.17 mln m³ of natural gas and 5,587.68 kt of oil; production in 2019 – 439.68 mln m³ of natural gas and 315.62 kt of oil.

Dzieduszyce (O+G) – documented in 2006; balance resources in 2019 – 63.71 mln m³ of natural gas and 445.45 kt of oil; production in 2019 – 2.26 mln m³ of natural gas and 15.64 kt of oil.

Gajewo (O+G) – documented in 2011; balance resources in 2019 – 8.84 mln m³ of natural gas and 22.38 kt of oil; production in 2019 – 2.08 mln m³ of natural gas and 6.66 kt of oil.

Grotów (O+G) – documented in 2005; balance resources in 2019 – 838.45 mln m³ of natural gas and 1,697.87 kt of oil; production in 2019 – 7.03 mln m³ of natural gas and 10.81 kt of oil.

Jeniniec (O+G) – documented in 1989; balance resources in 2019 – 0.62 mln m³ of natural gas and 3.83 kt of oil; production in 2019 – 0.16 mln m³ of natural gas and 1.84 kt of oil.

Lubiatów (O+G) – documented in 2003; balance resources in 2019 – 609.34 mln m³ of natural gas and 3,219.67 kt of oil; production in 2019 – 273.44 mln m³ of natural gas and 317.17 kt of oil.

Lubiszyn (O+G) – documented in 1999; balance resources in 2019 – 0.37 mln m³ of natural gas and 1.96 kt of oil; production in 2019 – 1.34 mln m³ of natural gas and 4.28 kt of oil.

Międzychód (G) – documented in 2003; balance resources in 2019 – 4,127.05 mln m³; production in 2019 – 33.39 mln m³.

Stanowice (G) – documented in 2003; balance resources in 2019 – 602.30 mln m³; production in 2019 – 0.00 mln m³.

3. TENDER AREA KARTUZY

5TH TENDER
ROUND



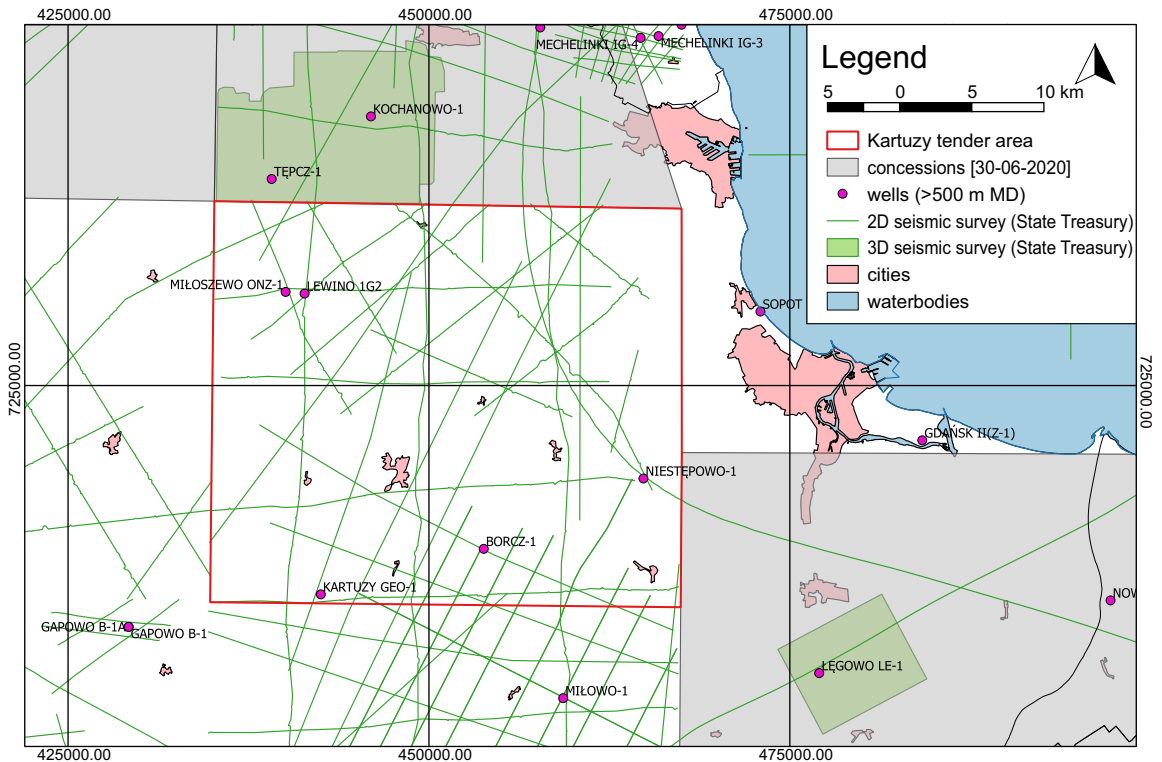
**ACREAGE: 898.42 km²
222,004 ACRES**

Location: onshore; in the areas of the following counties and communes: Pomorskie province, Gdańsk city county, commune: Gdańsk (4.26% of the area); Gdańsk county, communes: Kolbudy (3.63%), Przywidz (1.33%); Gdynia city county, commune: Gdynia (3.89%); Kartuzi county, communes: Chmielno (8.13%), Kartuzi (20.22%), Przdokowo (9.46%), Sierakowice (0.12%), Somonino (6.90%), Stężycza (0.84%), Żukowo (18.19%); Wejcherowo county, communes: Linia (5.44%), Luzino (0.88%), Łęczycze (<0.01%), Szemud (16.61%), Wejherowo (0.12%).

The Kartuzi tender area is located in the Northern Petroleum Province. Here, the Precambrian basement of the East European Platform occurs at depth about 4,500 m b.s.l., building the Teba High. The High is covered by the Ediacaran-Quaternary succession of sedimentary rocks. The main exploration target is related to the Cambrian sandstones, in which conventional accumulations of gas and oil and unconventional tight-gas and tight-oil are expected. Also the Ordovician and Silurian fine-grained clastics are additional target for unconventional shale-oil and shale-gas occurrences.

Four deep wells (>500 m MD) reach the prospective horizons in the Kartuzi tender area. The seismic survey includes 48 lines (2D) of a total length of 667.2 km. No 3D seismic survey has been performed, so far.

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3. TENDER AREA KARTUZY

Concession type:

prospecting and exploration of hydrocarbon deposits and production of hydrocarbons from deposits

Type of deposits:

conventional and unconventional for oil and gas

Structural stages:

Cenozoic

Laramian (Permian and Mesozoic)

Caledonian (Ediacaran-Lower Paleozoic)

Precambrian

Petroleum plays:

I – Lower Paleozoic

(unconventional for shale-gas and shale-oil)

II – Cambrian

(conventional and unconventional for tight-gas and tight-oil)

Source rocks:

I – Upper Cambrian, Ordovician and Silurian fine-grained clastic rocks

II – Upper Cambrian, Ordovician and Silurian fine-grained clastic rocks; interbeds of fine-grained clastic rocks in the Lower and Middle Cambrian

Reservoir rocks:

I – Ordovician and Silurian shales

(Sasino and Jantar formations)

II – Lower and Middle Cambrian sandstones

Seal rocks:

I – Ordovician and Silurian fine-grained clastic rocks

II – Upper Cambrian, Ordovician and Silurian fine-grained clastic rocks

Trap types:

I – unconventional/continuous

II – stratigraphic, structural, mixed; unconventional/continuous

Thickness of overburden:

I – 1,520.0–1,834.0 m

II – 3,490.0–3,726.9 m

Key wells (MD):

Borc 1 (3,759.0 m), Lewino 1G2 (3,600.4 m),

Miłozewo ONZ-1 (1,558.0 m), Niestępowo 1 (3,632.9 m)

Complete seismic surveys (owner):

1997: 1 line Polonaise'97 (State Treasury)

2003-2007: 17 lines Gdańsk 2D (PGNiG S.A.)

2010: 13 lines Baltic Basin Gdańsk-W 2D (State Treasury)

2011-2012: 16 lines Somonino-Przywidz 2D (State Treasury)

2012: 1 line PolandSPAN 2D (ION, State Treasury)

Oil and gas deposits in the vicinity (G – gas; O – oil):

none

4. TENDER AREA SIEDLCE W

5TH TENDER ROUND



**ACREAGE: 1200.00 km²
296,526 ACRES**

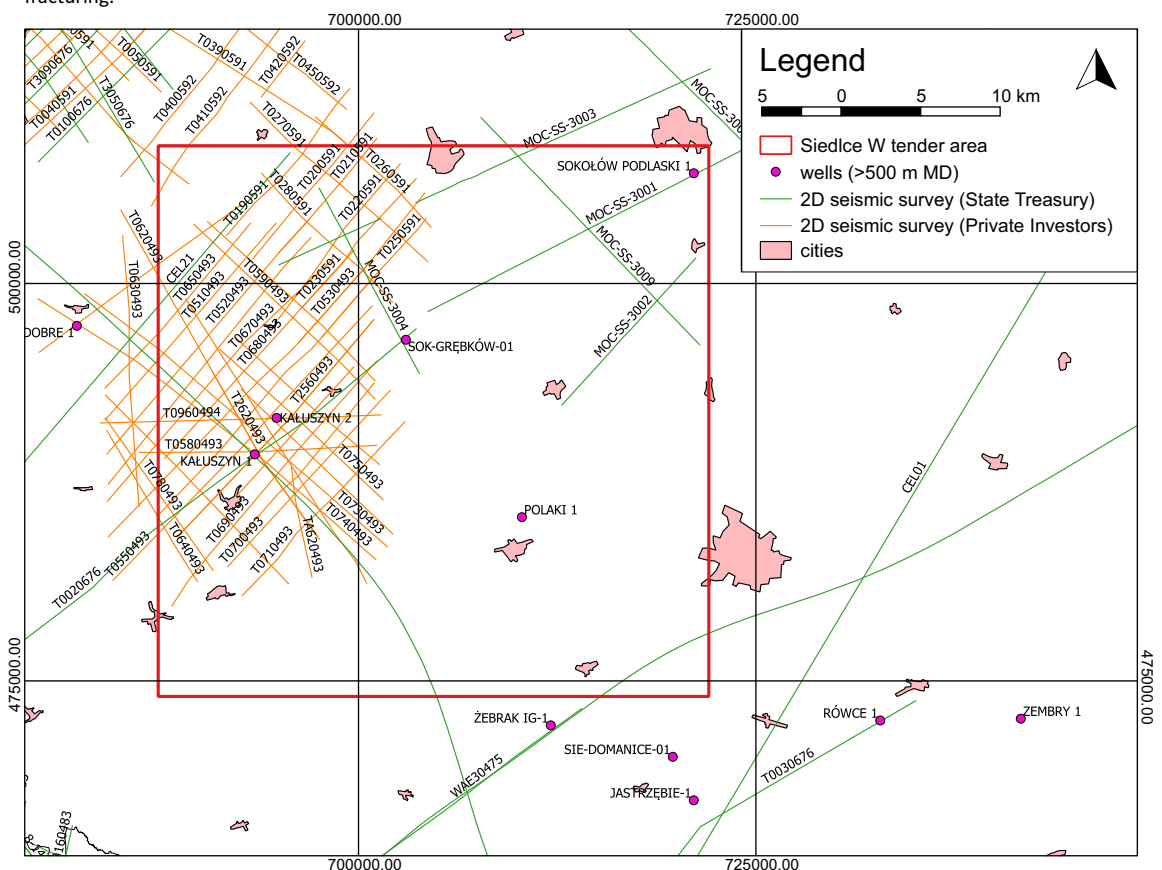
Location: onshore; in the areas of the following counties and communes: Mazowieckie province, Mińsk county, communes: Cegłów (2.33% of the area), Dobre (0.96%), Jakubów (0.34%), Kałuszyn (7.82%), Mrozy (8.14%); Siedlce city county, commune: Siedlce city (0.55%); Siedlce county, communes: Kotuń (12.52%), Mokobody (9.94%), Siedlce (3.84%), Skórzec (6.74%), Suchożebry (2.32%), Wiśniew (0.76%), Wodnie (<0.00%); Sokołów county, communes: Bielany (5.52%), Sokołów Podlaski city (0.29%), Sokołów Podlaski (3.45%); Węgrów county, communes: Grębków (10.89%), Korytnica (4.80%), Liw (9.03%), Węgrów (1.41%), Wierzbo (8.35%).

The Siedlce W tender area is located in the Eastern Petroleum Province. Here, the main exploration target is related to the unconventional accumulations of shale-gas and shale-oil in the mudstones of the Silurian Pelplin Formation. The formation have TOC exceeding 2%, S1 parameter oscillating around 0.5 mg HC/g of rock, while the values of S2 are estimated between 5 and 6 mg HC/g of rock, which suggest good generation potential. The Pelplin Formation is also homogeneous in terms of geochemical parameters. The Brittle Index value oscillate between 0.55 and 0.6. The Young modulus value, measured parallel to the layers, oscillate around 65 GPa, and the Poisson's ratio equals 0.235. The rocks of the Pelplin Formation are susceptible to hydraulic fracturing.

On the other side, the conventional accumulations of oil, condensate and gas are expected in the Middle Cambrian sandstones, which can be considered as an additional exploration target. The median porosity oscillates between 5 and 15%.

Five deep wells (>500 m MD) reach the prospective horizons in the Siedlce W tender area. The seismic survey includes 52 lines (2D) of a total length of 196.3 km. No 3D seismic survey has been performed, so far.

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4. TENDER AREA SIEDLCE W

Concession type:

prospecting and exploration of hydrocarbon deposits and production of hydrocarbons from deposits

Type of deposits:

conventional and unconventional for oil and gas

Structural stages:

Cenozoic

Laramian (Permian and Mesozoic)

Caledonian (Ediacaran-Lower Paleozoic)

Precambrian

Petroleum plays:

I – Lower Paleozoic (unconventional shale-type)

II – Cambrian (conventional)

Source rocks:

I – Silurian fine-grained clastic rocks (Pelplin Formation)

II – Upper Cambrian, Ordovician and Silurian fine-grained clastic rocks; fine-grained clastic interbeds in the Cambrian

Reservoir rocks:

I – Silurian fine-grained clastic rocks (Pelplin Formation)

II – Middle Cambrian sandstones

Seal rocks:

I – Silurian fine-grained clastic rocks

II – Upper Cambrian, Ordovician and Silurian fine-grained clastic rocks

Trap types:

I – unconventional/continuous

II – stratigraphic, structural, mixed

Thickness of overburden:

I – 1,227.0–1,360.9 m

II – 1,739.0–2,399.3 m

Key wells (MD):

Kałużyn 1 (3,190.0 m), Kałużyn 2 (2,480.0 m), Polaki 1 (2,780.7 m), SOK-Grębków-01 (2,243.0 m), Sokołów Podlaski 1 (1,771.0 m)

Complete seismic surveys (owner):

1976: 1 line Kałużyn-Dobre-Wierzbnio 2D (State Treasury)

1991-1991: 12 lines Tłuszcz-Dęblin-Lublin 2D (PGNiG S.A.)

1993-1994: 33 lines Kałużyn-Dobre-Wierzbnio 2D (PGNiG S.A.)

2000: 1 line CEL21 (State Treasury)

2011: 6 lines Sokołów Podlaski 2D (State Treasury)

Oil and gas deposits in the vicinity (G – gas; O – oil):

none





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OTHER

PROSPECTIVE AREAS
IN POLAND 2020-2021

1. CONVENTIONAL

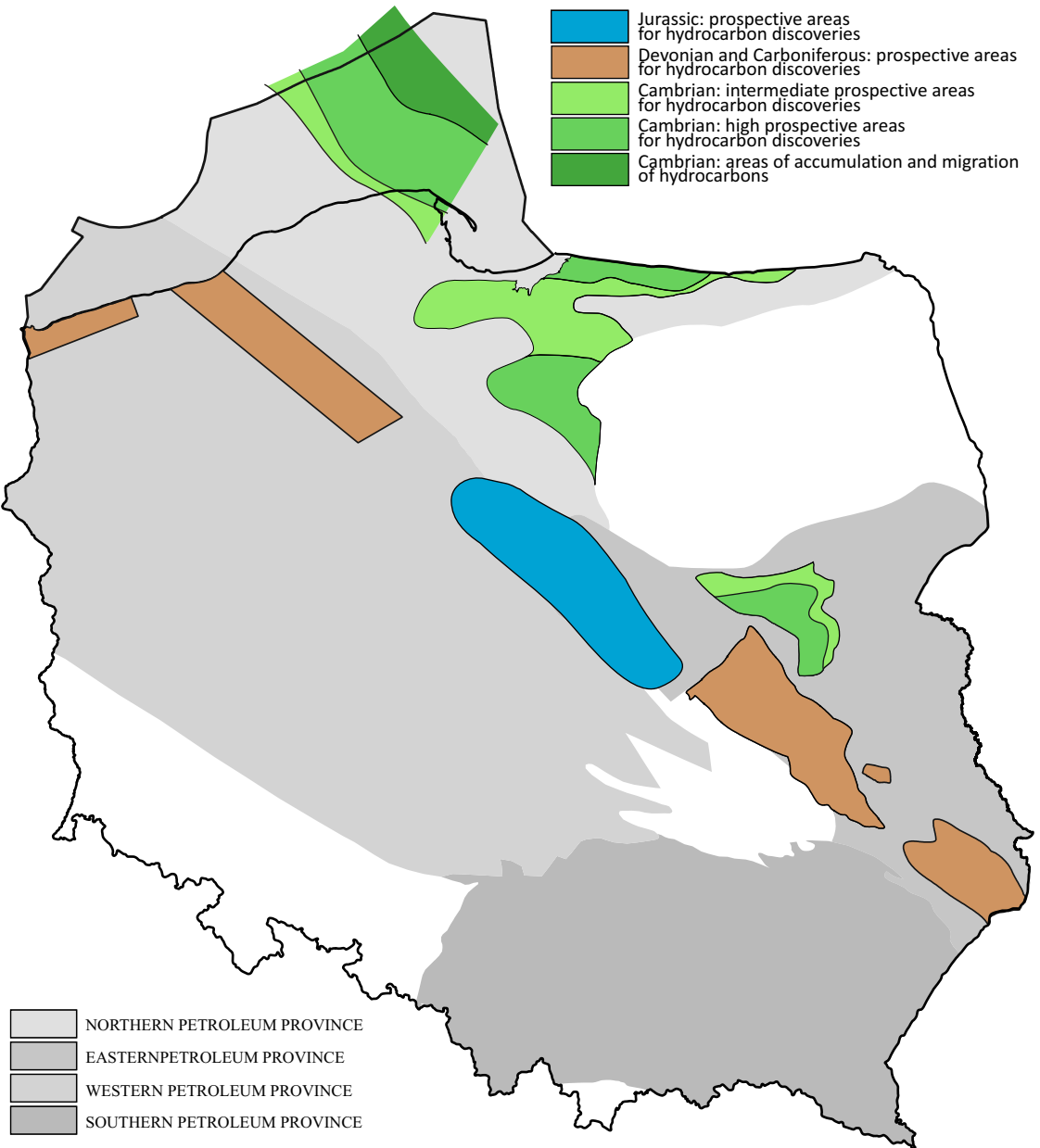
Jurassic

Carboniferous and Devonian

Cambrian

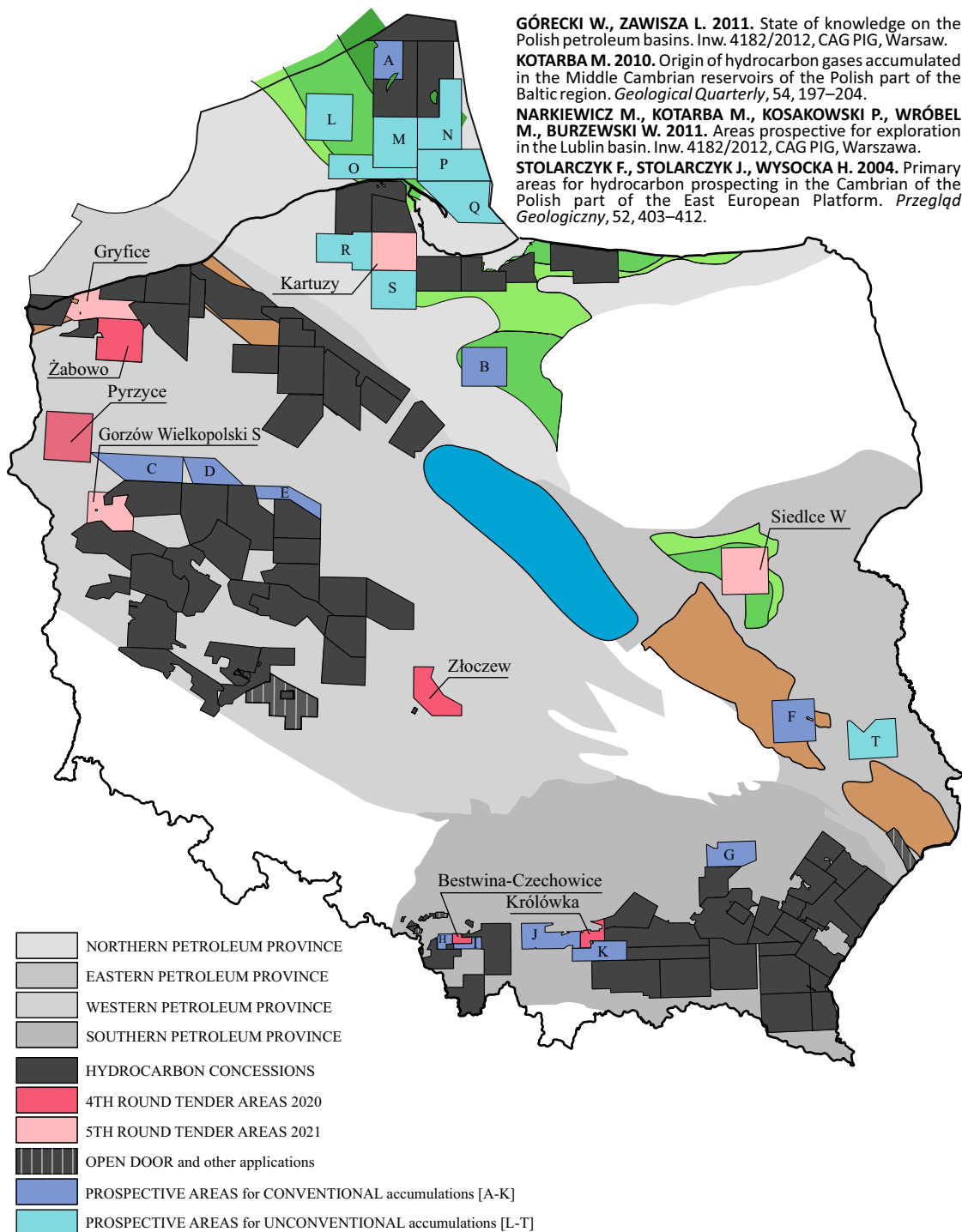
2020-2021 INFORMATION
AND OPPORTUNITIES

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1. CONVENTIONAL Jurassic Carboniferous and Devonian Cambrian

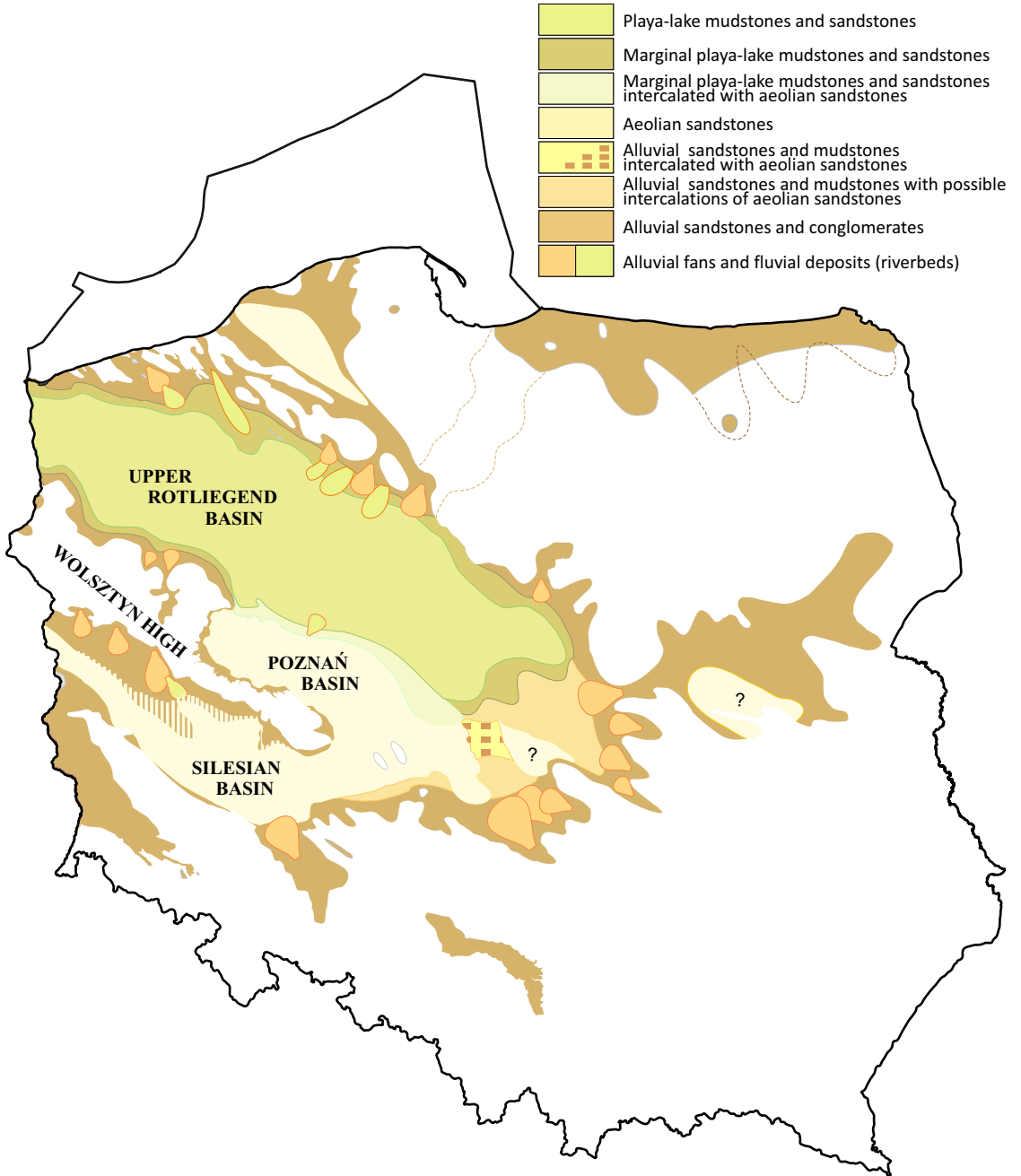
2020-2021 INFORMATION
AND OPPORTUNITIES



2.CONVENTIONAL Permian/Rotliegend

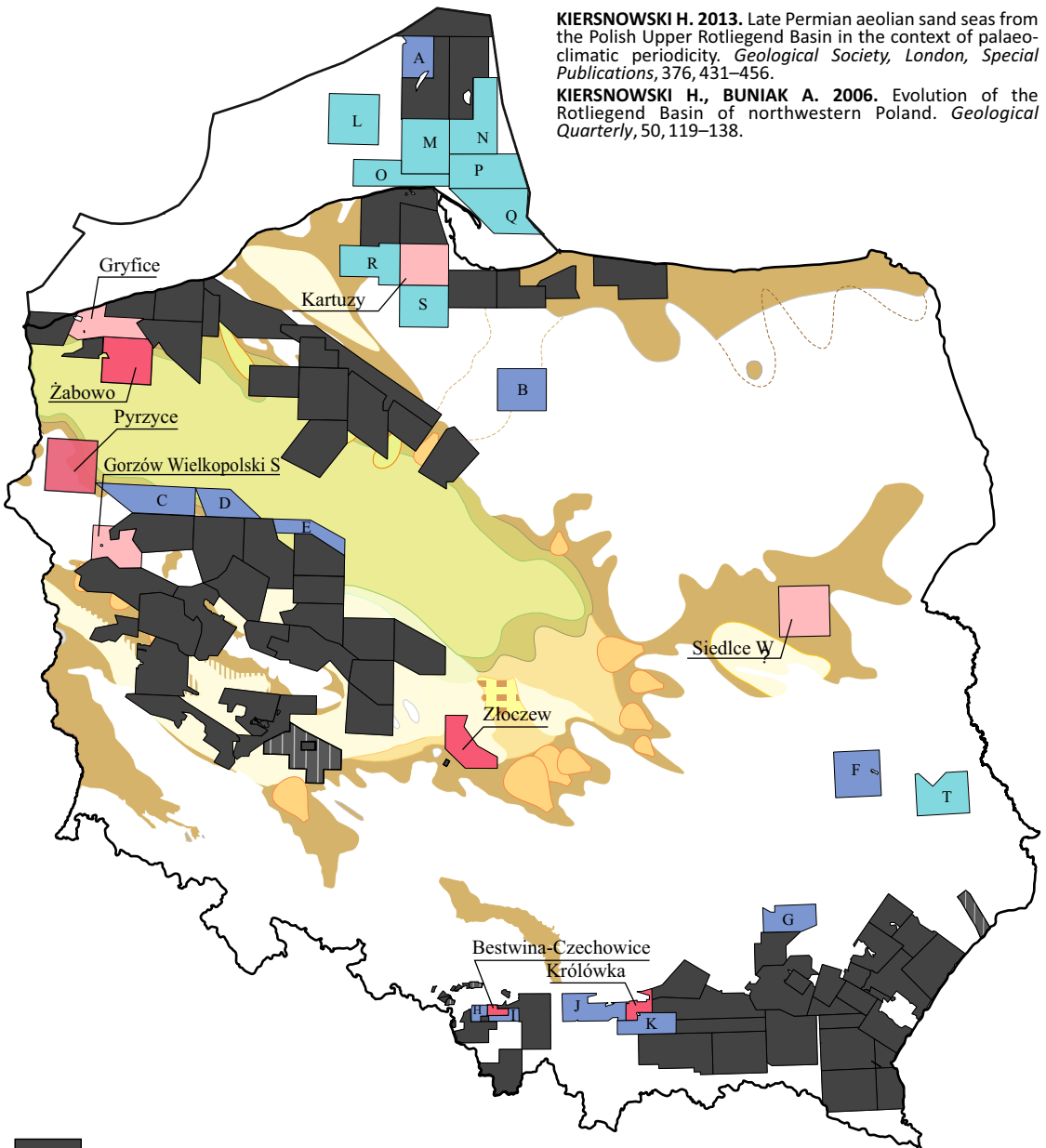
2020-2021 INFORMATION
AND OPPORTUNITIES

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2. CONVENTIONAL Permian/Rotliegend

2020-2021 INFORMATION AND OPPORTUNITIES



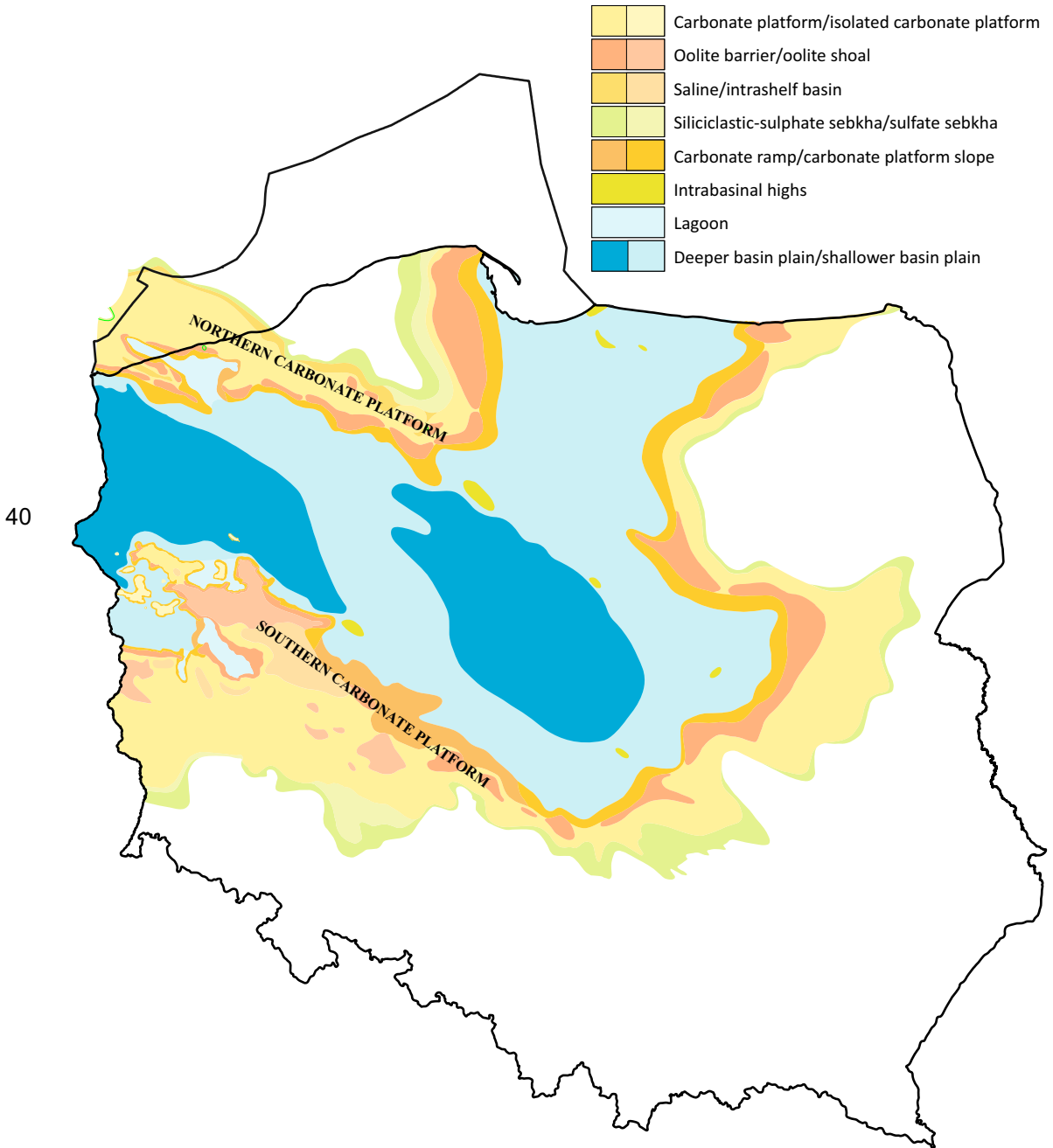
KIERSNOWSKI H. 2013. Late Permian aeolian sand seas from the Polish Upper Rotliegend Basin in the context of palaeoclimatic periodicity. *Geological Society, London, Special Publications*, 376, 431–456.

KIERSNOWSKI H., BUNIAK A. 2006. Evolution of the Rotliegend Basin of northwestern Poland. *Geological Quarterly*, 50, 119–138.

- HYDROCARBON CONCESSIONS
- 4TH ROUND TENDER AREAS 2020
- 5TH ROUND TENDER AREAS 2021
- OPEN DOOR and other applications
- PROSPECTIVE AREAS for CONVENTIONAL accumulations [A-K]
- PROSPECTIVE AREAS for UNCONVENTIONAL accumulations [L-T]

3. CONVENTIONAL Permian/Zechstein Main Dolomite

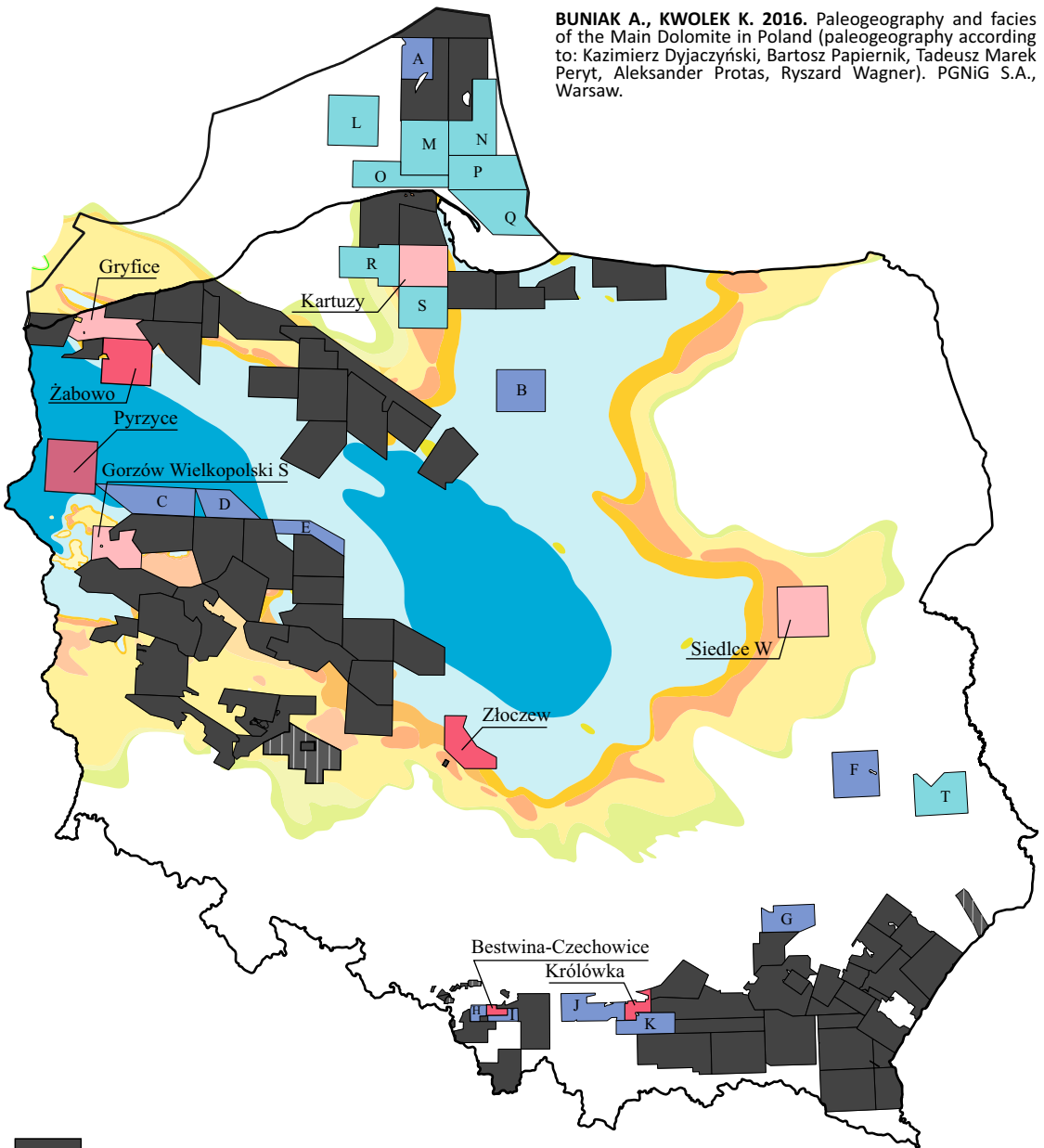
2020-2021 INFORMATION
AND OPPORTUNITIES



3. CONVENTIONAL Permian/Zechstein Main Dolomite

2020-2021 INFORMATION
AND OPPORTUNITIES

BUNIAK A., KWOLEK K. 2016. Paleogeography and facies of the Main Dolomite in Poland (paleogeography according to: Kazimierz Dyjaczynski, Bartosz Papiernik, Tadeusz Marek Peryt, Aleksander Protas, Ryszard Wagner). PGNiG S.A., Warsaw.



- HYDROCARBON CONCESSIONS
- 4TH ROUND TENDER AREAS 2020
- 5TH ROUND TENDER AREAS 2021
- OPEN DOOR and other applications
- PROSPECTIVE AREAS for CONVENTIONAL accumulations [A-K]
- PROSPECTIVE AREAS for UNCONVENTIONAL accumulations [L-T]

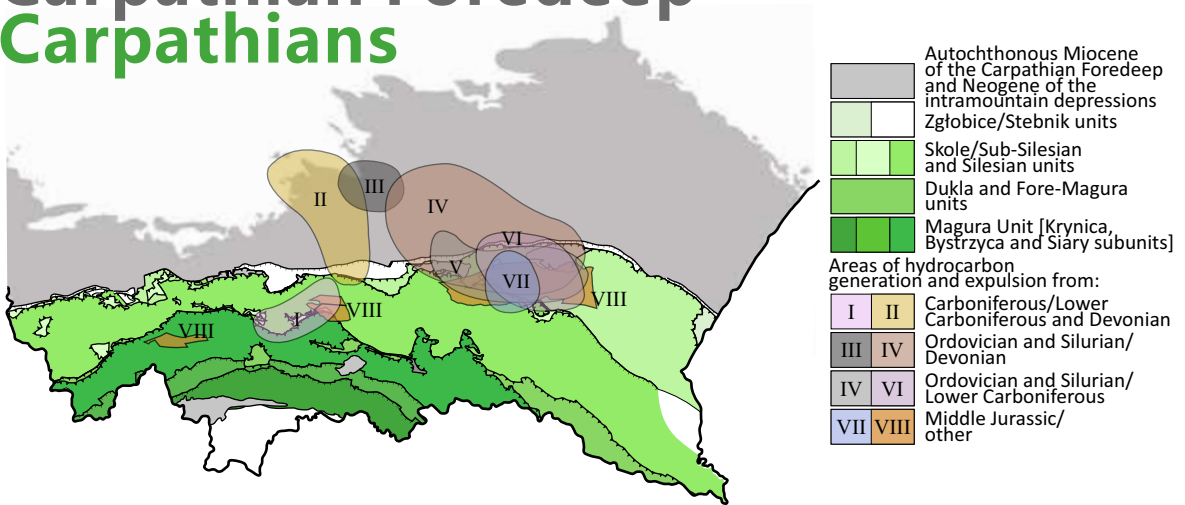
4. CONVENTIONAL

Carpathian basement

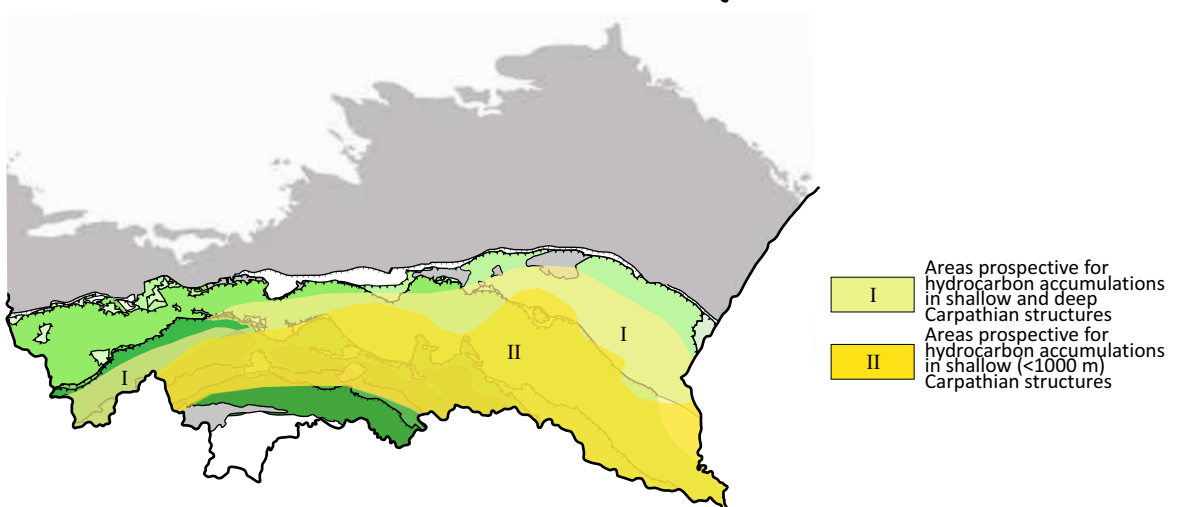
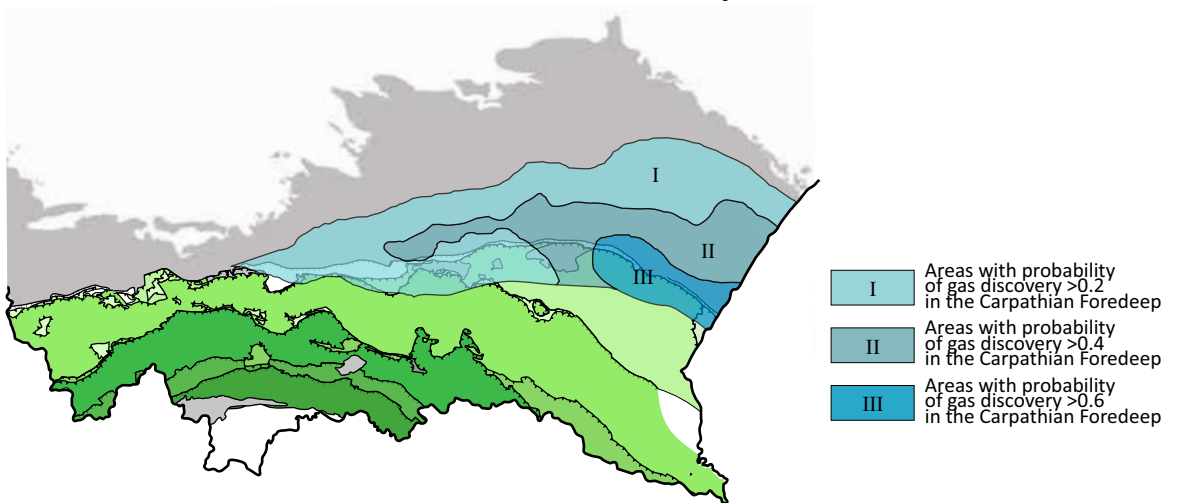
Carpathian Foredeep

Carpathians

2020-2021 INFORMATION AND OPPORTUNITIES



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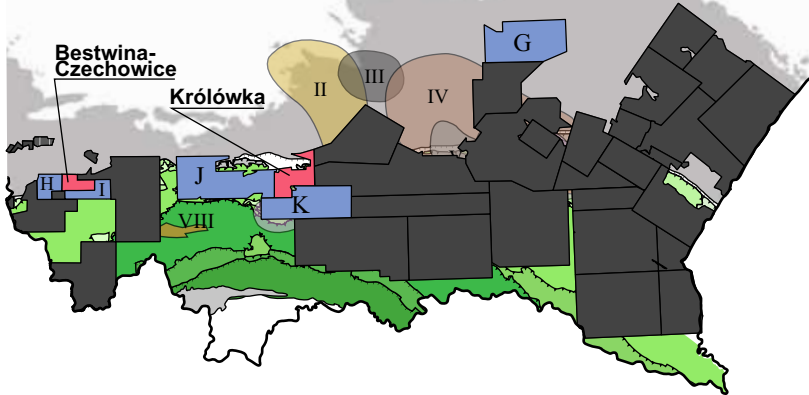
4. CONVENTIONAL

Carpathian basement

Carpathian Foredeep

Carpathians

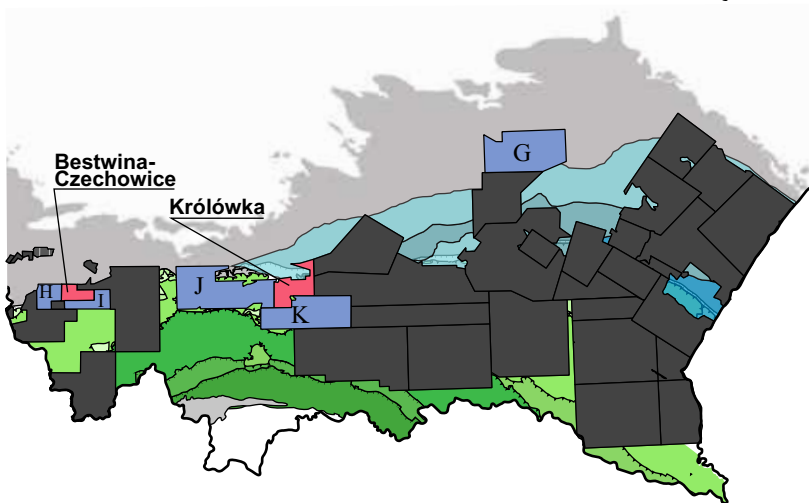
2020-2021 INFORMATION
AND OPPORTUNITIES







GÓRECKI W., ZAWISZA L. 2011. State of knowledge on the Polish petroleum basins. Inw. 4182/2012, CAG PIG, Warsaw.

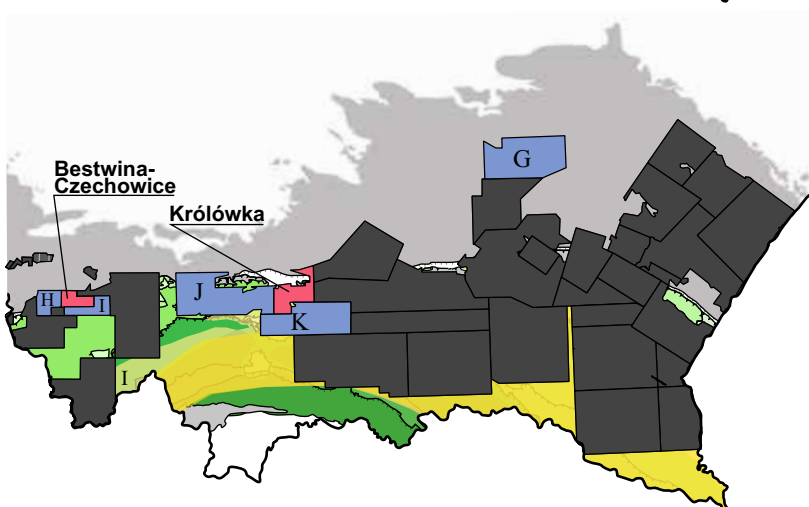
KOTARBA M., WIĘCŁAW D., KOSAKOWSKI P., WRÓBEL M., MATYSZKIEWICZ J., BUŁA Z., KRAJEWSKI M., KOLTUN Y., TARKOWSKI J. 2011. Petroleum systems in the Palaeozoic –Mesozoic basement of the Polish and Ukrainian parts of the Carpathian Foredeep. *Annales Societatis Geologorum Poloniae*, 81, 487–522.

POPRAWA P., MALATA T., OLSZEWSKA B., SZYDŁO A., GARECKA M. 2010. Reconstruction of the petroleum systems in the Polish Outer Carpathians. Inw. 107/2011, CAG PIG, Warsaw.



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-  HYDROCARBON CONCESSIONS
-  OPEN DOOR and other applications
-  4TH ROUND TENDER AREAS 2020
-  PROSPECTIVE AREAS for CONVENTIONAL accumulations [A-K]







5. TIGHT GAS

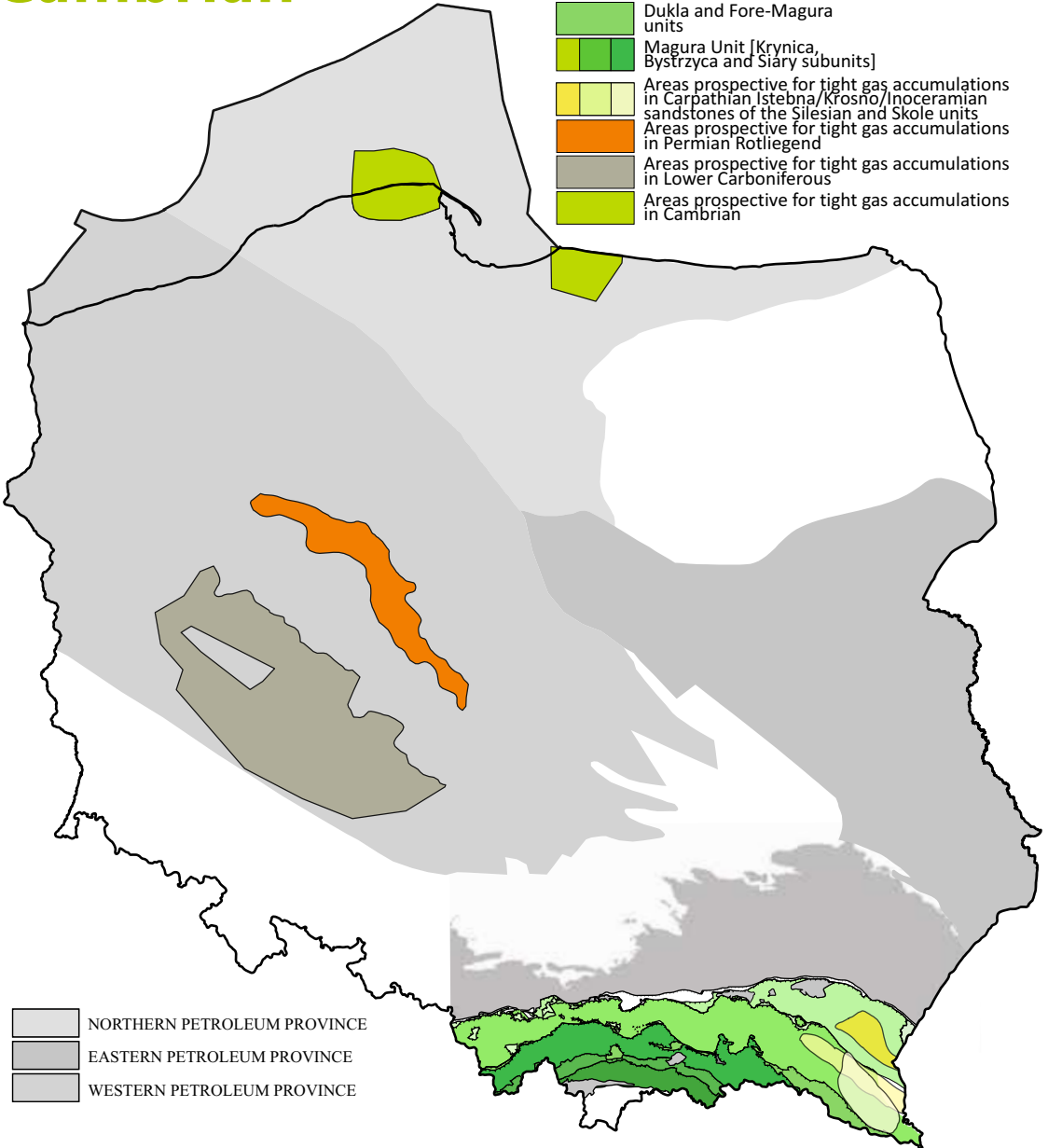
Carpathians




Permian

Carboniferous

Cambrian

-  Autochthonous Miocene of the Carpathian Foredeep and Neogene of the intramountain depressions
-  Zgłobice/Stebnik units
-  Skole/Sub-Silesian and Silesian units
-  Dukla and Fore-Magura units
-  Magura Unit [Krynica, Bystrzyca and Siary subunits]
-  Areas prospective for tight gas accumulations in Carpathian Istebna/Krosno/Inoceranian sandstones of the Silesian and Skole units
-  Areas prospective for tight gas accumulations in Permian Rotliegend
-  Areas prospective for tight gas accumulations in Lower Carboniferous
-  Areas prospective for tight gas accumulations in Cambrian



-  NORTHERN PETROLEUM PROVINCE
-  EASTERN PETROLEUM PROVINCE
-  WESTERN PETROLEUM PROVINCE

5. TIGHT GAS

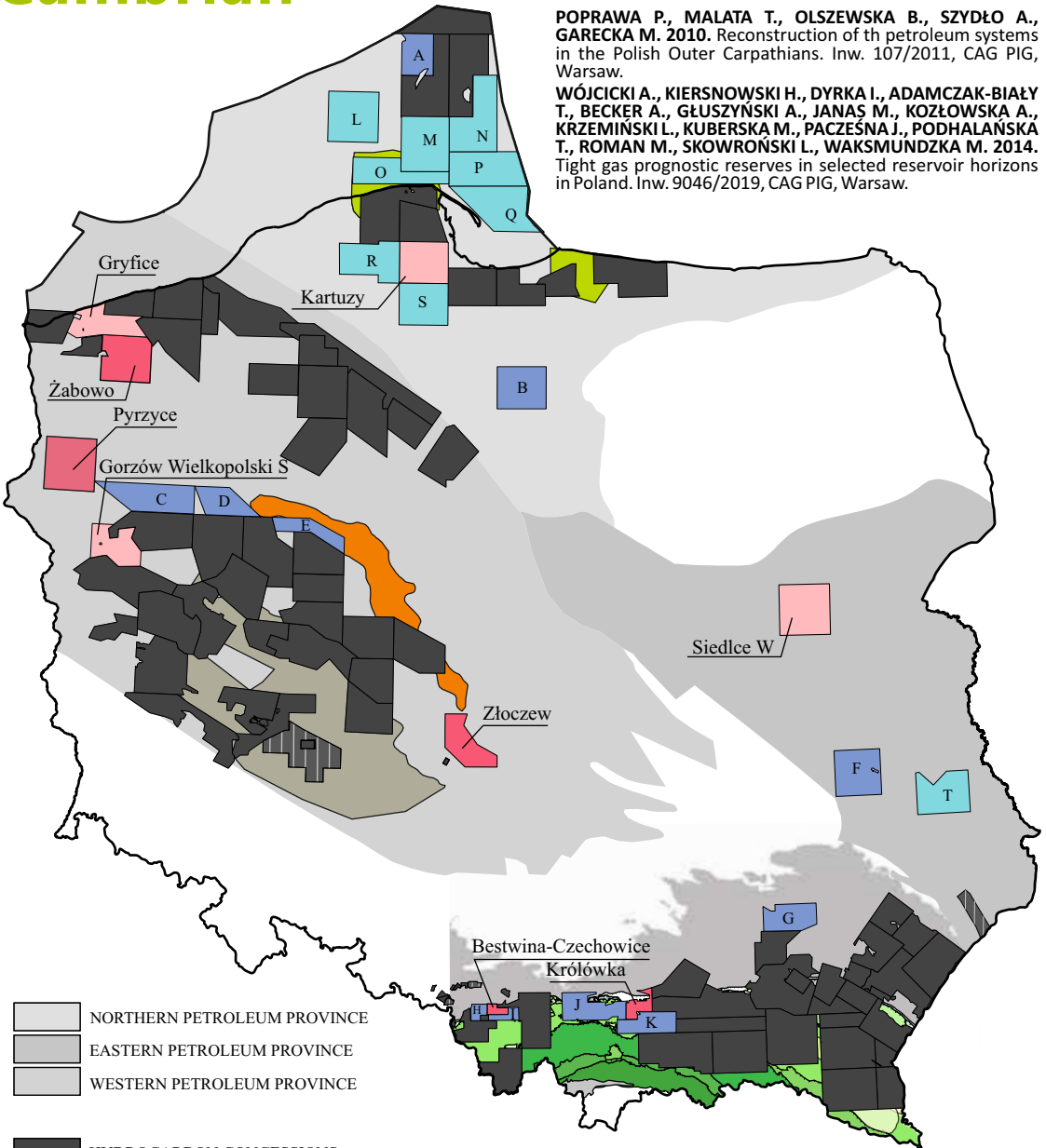
Carpathians

Permian

Carboniferous

Cambrian

2020-2021 INFORMATION AND OPPORTUNITIES



POPRAWA P., MALATA T., OLSZEWSKA B., SZYDŁO A., GARECKA M. 2010. Reconstruction of the petroleum systems in the Polish Outer Carpathians. Inw. 107/2011, CAG PIG, Warsaw.

WÓJCICKI A., KIERSNOWSKI H., DYRKA I., ADAMCZAK-BIAŁY T., BECKER A., GŁUSZYŃSKI A., JANAS M., KOZŁOWSKA A., KRZEMIŃSKI L., KUBERSKA M., PACZEŚNA J., PODHALAŃSKA T., ROMAN M., SKOWROŃSKI L., WAKSMUNDZKA M. 2014. Tight gas prognostic reserves in selected reservoir horizons in Poland. Inw. 9046/2019, CAG PIG, Warsaw.

- NORTHERN PETROLEUM PROVINCE
- EASTERN PETROLEUM PROVINCE
- WESTERN PETROLEUM PROVINCE

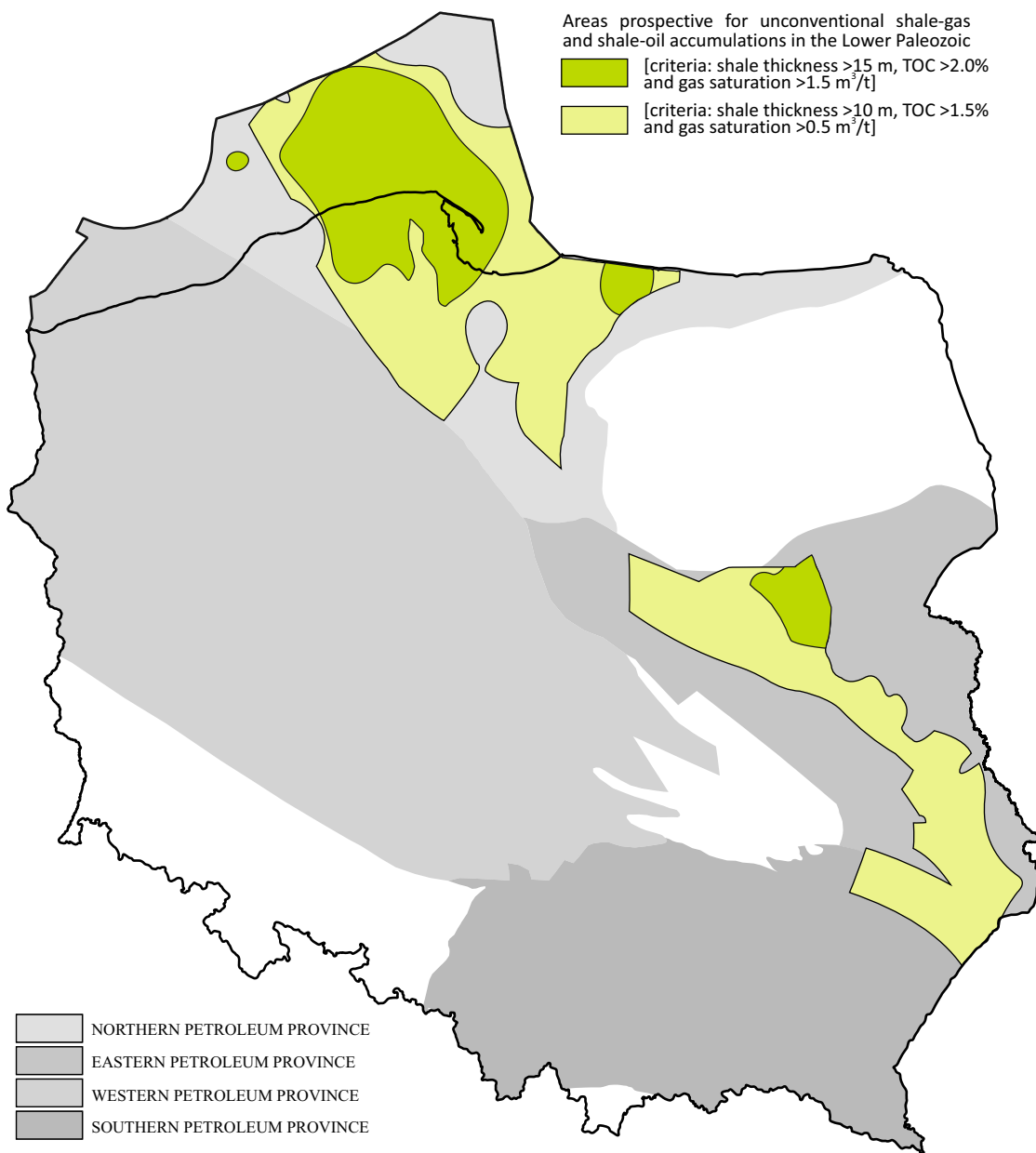
- HYDROCARBON CONCESSIONS
- 4TH ROUND TENDER AREAS 2020
- 5TH ROUND TENDER AREAS 2021
- OPEN DOOR and other applications
- PROSPECTIVE AREAS for CONVENTIONAL accumulations [A-K]
- PROSPECTIVE AREAS for UNCONVENTIONAL accumulations [L-T]

6. SHALE GAS AND OIL

Lower Paleozoic

2020-2021 INFORMATION AND OPPORTUNITIES

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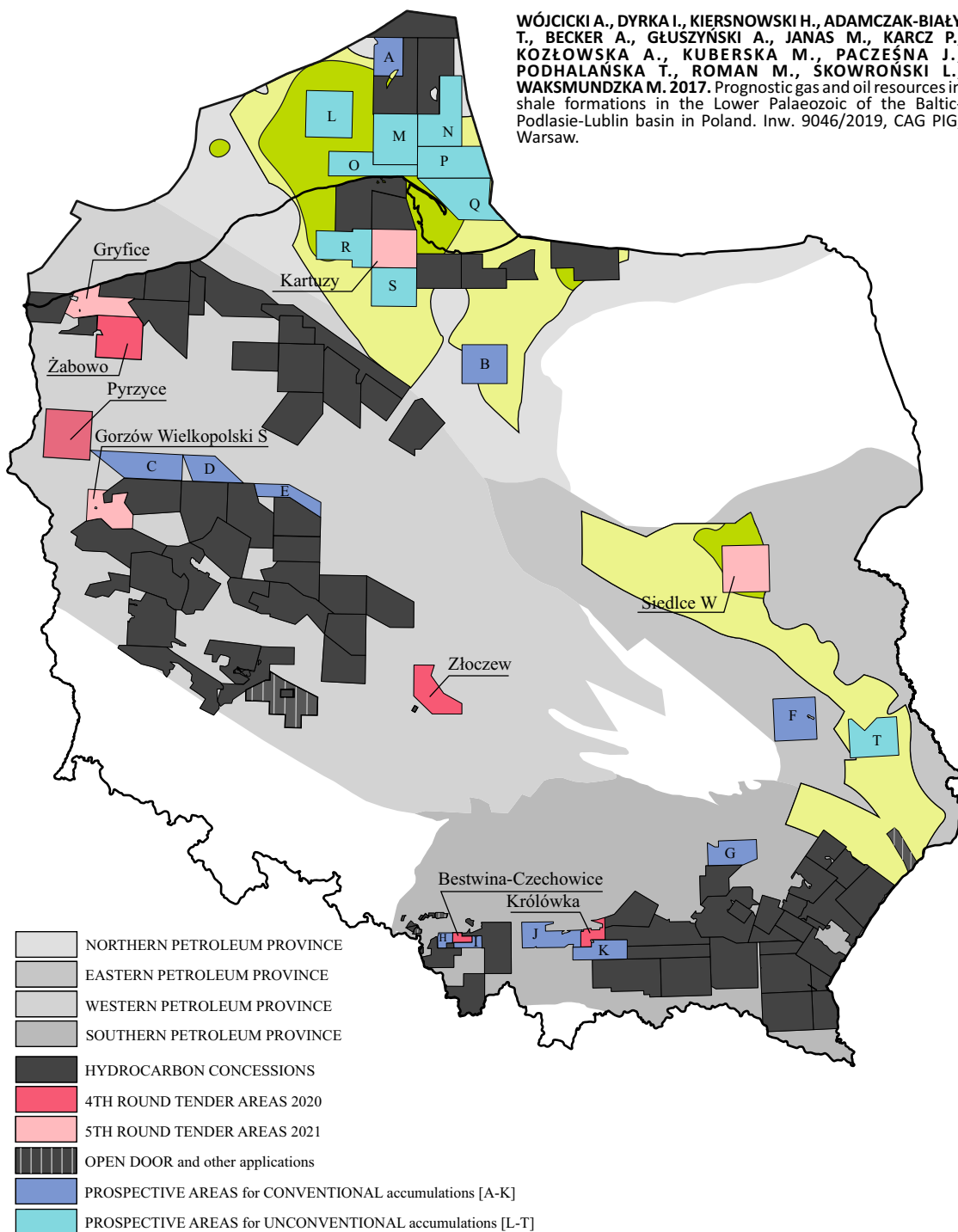


6. SHALE GAS AND OIL

Lower Paleozoic

2020-2021 INFORMATION AND OPPORTUNITIES

WÓJCICKI A., DYRKA I., KIERSNOWSKI H., ADAMCZAK-BIAŁY T., BECKER A., GŁUSZYŃSKI A., JANAS M., KARCZ P., KOZŁOWSKA A., KUBERSKA M., PACZEŚNA J., PODHALAŃSKA T., ROMAN M., SKOWROŃSKI L., WAKSMUNDZKA M. 2017. Prognostic gas and oil resources in shale formations in the Lower Palaeozoic of the Baltic-Podlasie-Lublin basin in Poland. Inw. 9046/2019, CAG PIG, Warsaw.







6. SHALE GAS AND OIL

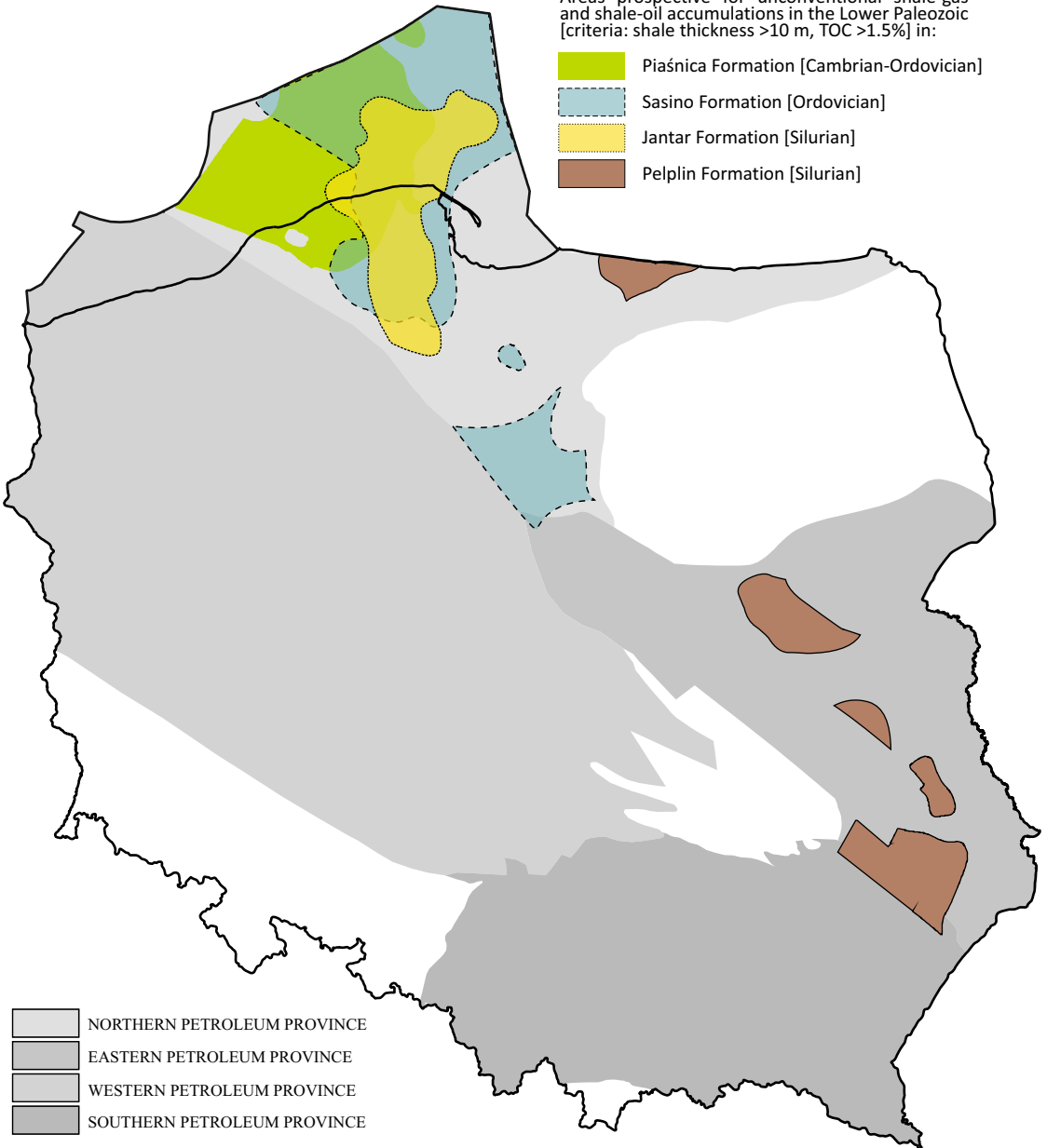
2020-2021 INFORMATION AND OPPORTUNITIES





Ordovician and Silurian Piaśnica, Sasino, Jantar, Pelplin Formations

Areas prospective for unconventional shale-gas and shale-oil accumulations in the Lower Paleozoic [criteria: shale thickness >10 m, TOC >1.5%] in:

-  Piaśnica Formation [Cambrian-Ordovician]
-  Sasino Formation [Ordovician]
-  Jantar Formation [Silurian]
-  Pelplin Formation [Silurian]

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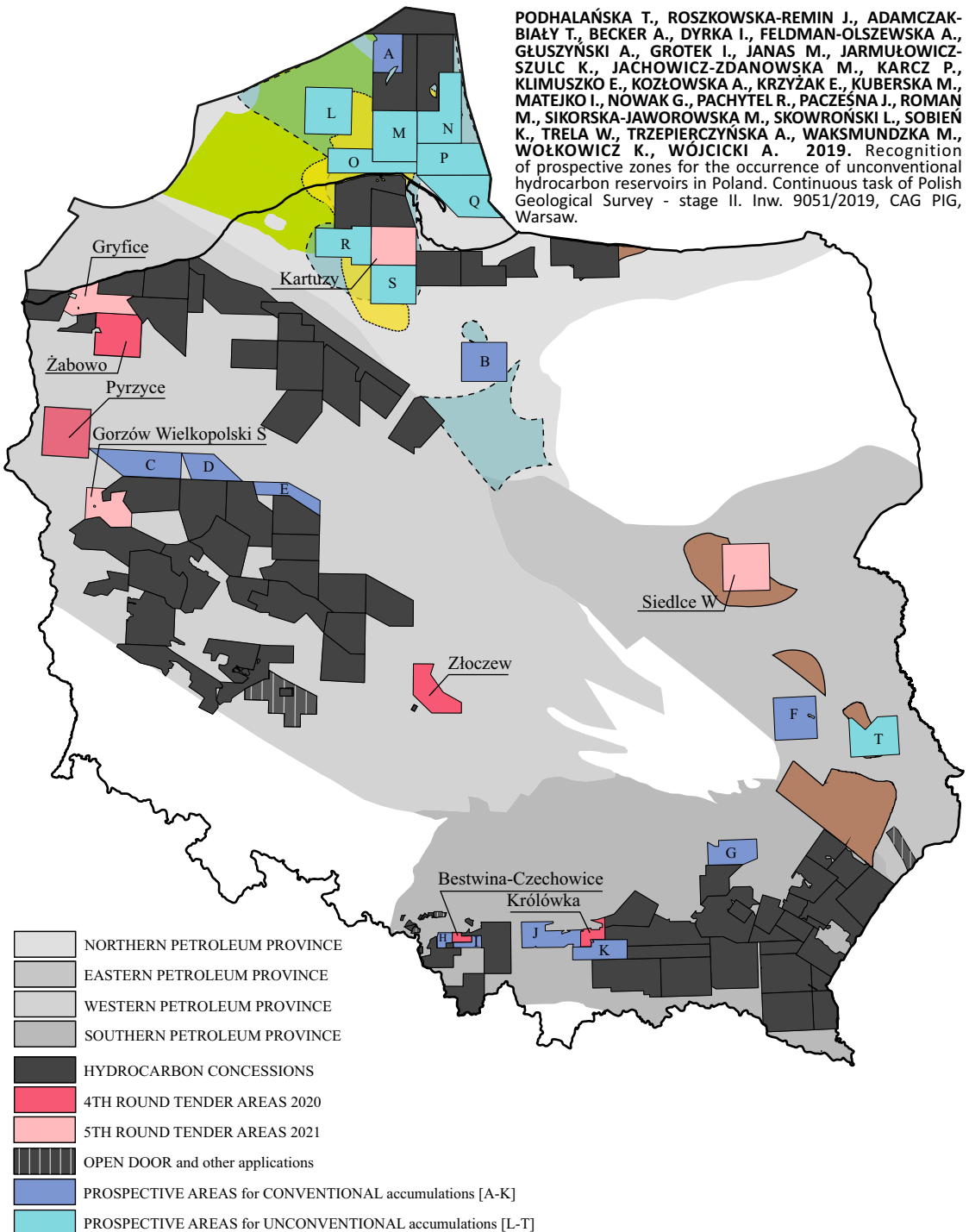


-  NORTHERN PETROLEUM PROVINCE
-  EASTERN PETROLEUM PROVINCE
-  WESTERN PETROLEUM PROVINCE
-  SOUTHERN PETROLEUM PROVINCE

6. SHALE GAS AND OIL

2020-2021 INFORMATION AND OPPORTUNITIES

Ordovician and Silurian Piaśnica, Sasino, Jantar, Pelplin Formations







OIL AND GAS IN POLAND

A REVIEW

HISTORY OF HYDROCARBON DISCOVERIES IN POLAND

Petroleum traditions in Poland date back to the Middle Ages when crude oil seepages from the Carpathian flysch have been exploited. The discovery of kerosene distillation from petroleum and the invention of kerosene lamp in 1853 by Ignacy Łukasiewicz, a Polish pharmacist and entrepreneur, prompted exploration for more productive sources of petroleum. Łukasiewicz, the pioneer of petroleum industry in Europe, was the co-founder of the first oil mine worldwide (at Bóbrka near Jasło, SE Poland) and designed the first petroleum refinery in the world. The beginning of petroleum extraction at Bóbrka (5 years before the first oil well drilling in Pennsylvania) and the discovery of a large oil plays in Eastern Carpathians at the turn of the 19th century (including the largest oilfield in the Carpathian flysch near Borysław) marked the beginning petroleum industry development in that region. The Sub-Carpathian reservoirs are still being produced today, although a majority of crude oil comes from reservoirs that have been discovered in Central Poland after The Second World War.

16th Century Petroleum from the Carpathian flysch is used commercially

1853 The method of petroleum distillation developed for the purposes of production and application of kerosene lamps

1854 The first oil company in the world established by Ignacy Łukasiewicz and Tytus Trzeciecki starts to produce crude oil at Bóbrka near Krosno. The Bóbrka Mine is still active and produces oil

1856 The first oil refinery, designed by Ignacy Łukasiewicz is opened at Ulaszowice

1896 Discovery of the largest Tertiary oil reservoirs at Borysław

1909 With an output of over 2 million tonnes of oil per year Poland is the third producer of petroleum in the world, behind USA and Russia

1954 The first underground gas storage facility in Europe is commissioned at Roztoki near Jasło

1958 Przemyśl – the largest gas field in Poland – discovered

1981 The first offshore oil reservoir discovered by Petrobaltic Company in the Polish economic zone of the Baltic Sea

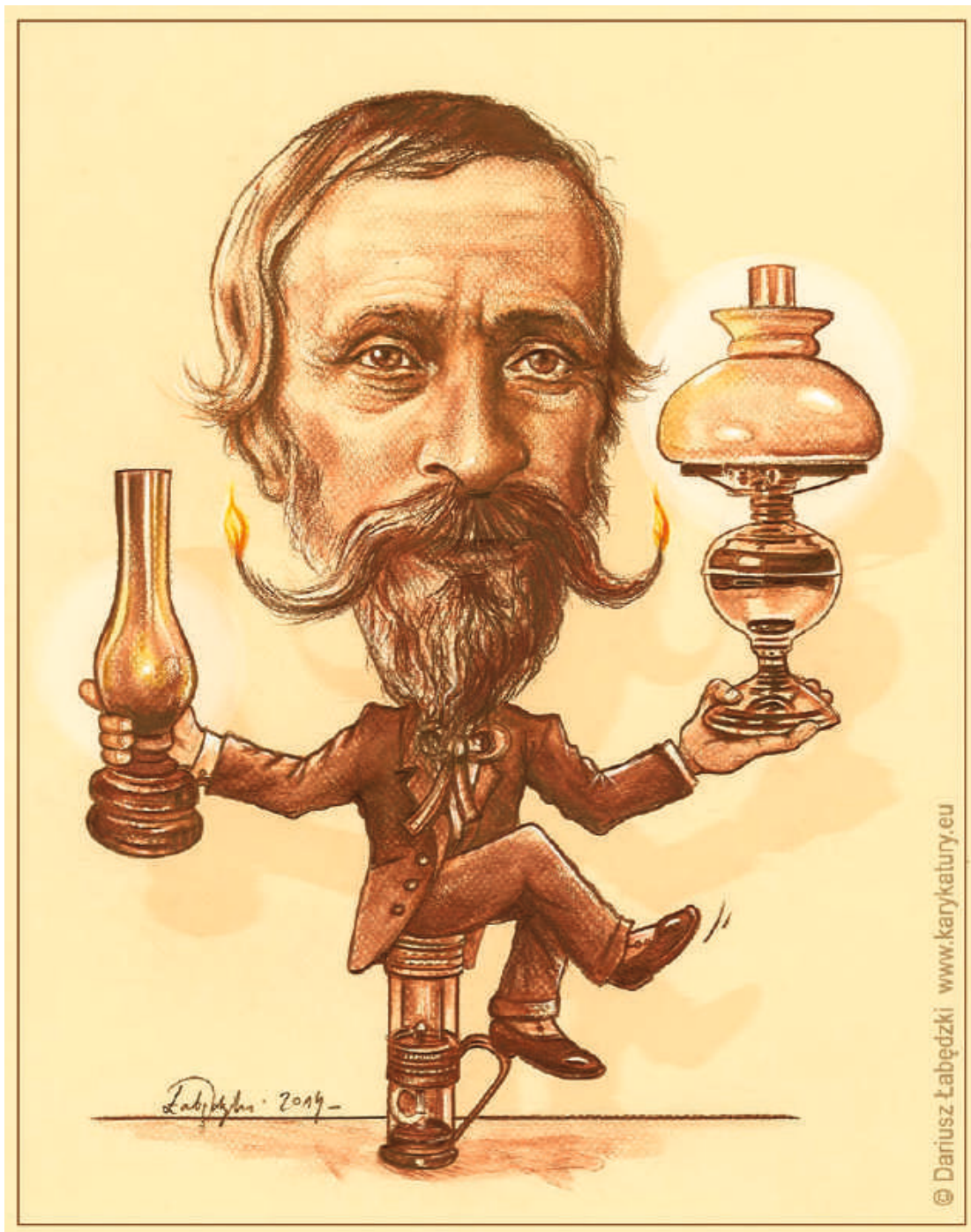
1990 Coal bed methane (CBM) produced in the Upper Silesian Coal Basin where an exploratory drilling programme is underway

1993 Barnówko-Mostno-Buszewo – the largest oilfield in Poland – discovered

2007 The first tight gas reservoir – Trzek – discovered

2016 First licensing round for hydrocarbon concessions

2018 Open door procedure for hydrocarbon concessions



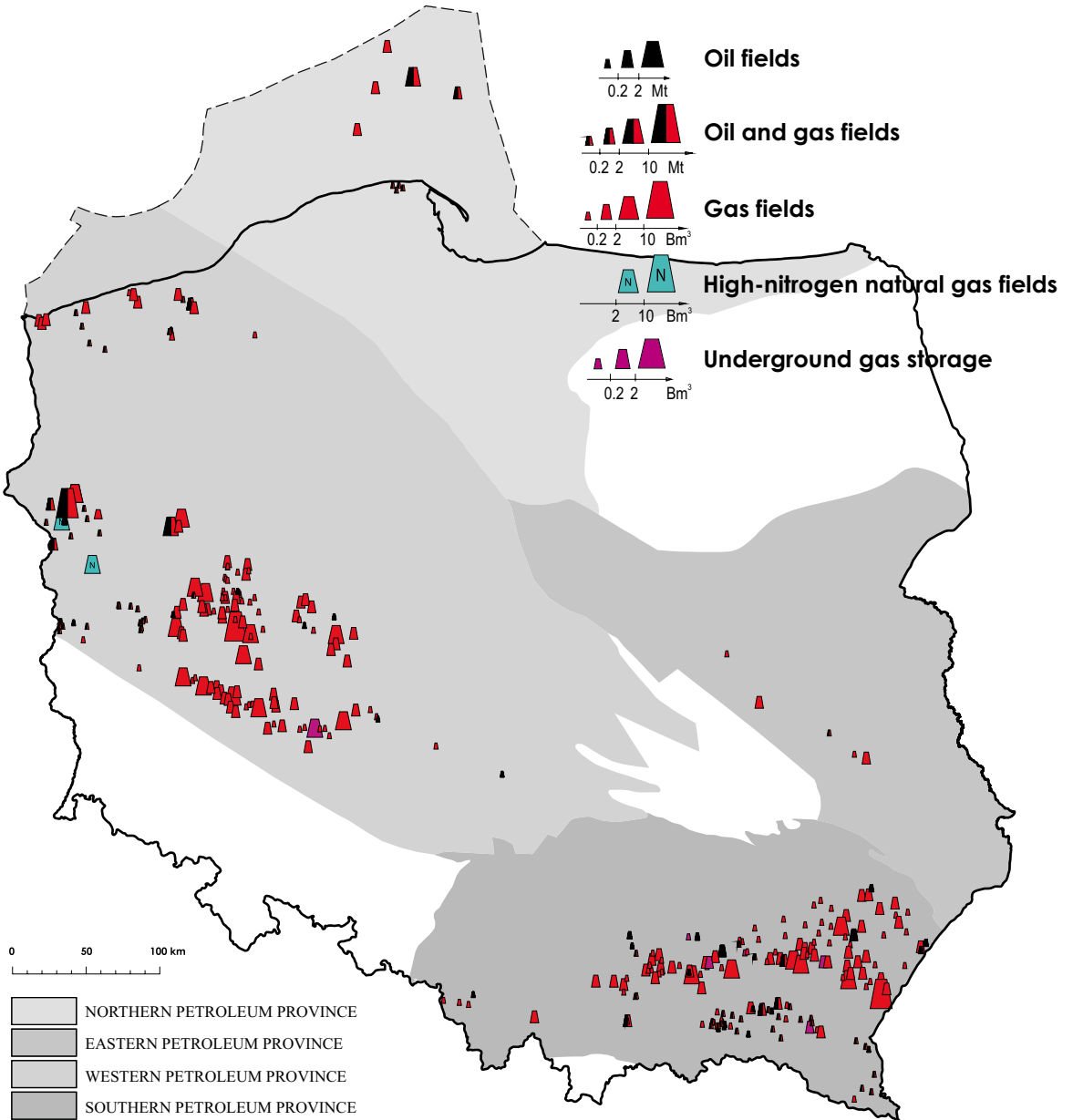
Ignacy Łukasiewicz

OIL AND GAS IN POLAND

Fields

2020-2021 INFORMATION
AND OPPORTUNITIES

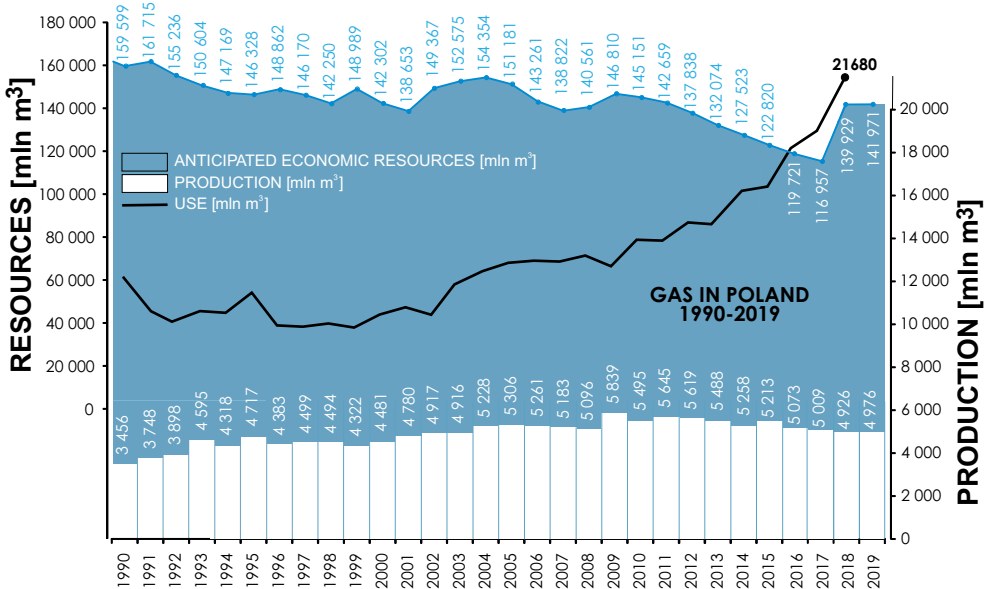
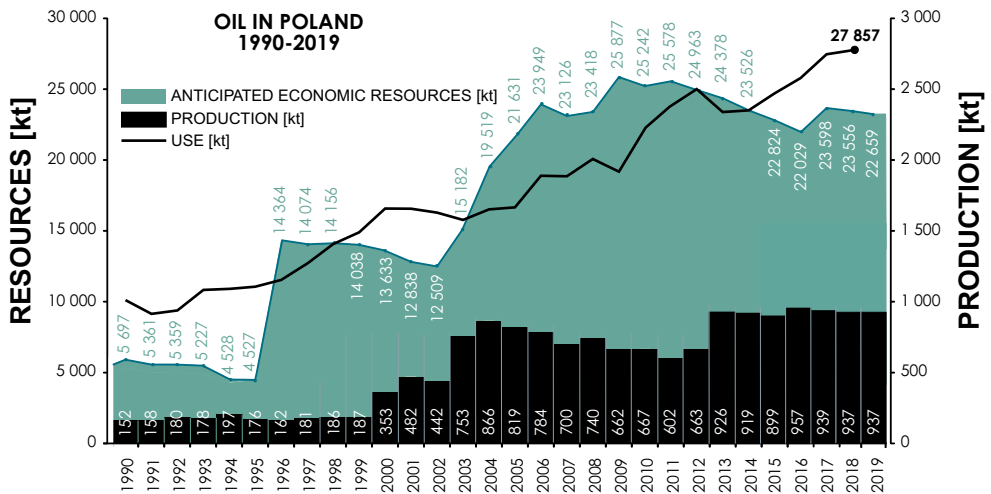
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OIL AND GAS IN POLAND

2020-2021 INFORMATION
AND OPPORTUNITIES

Resources



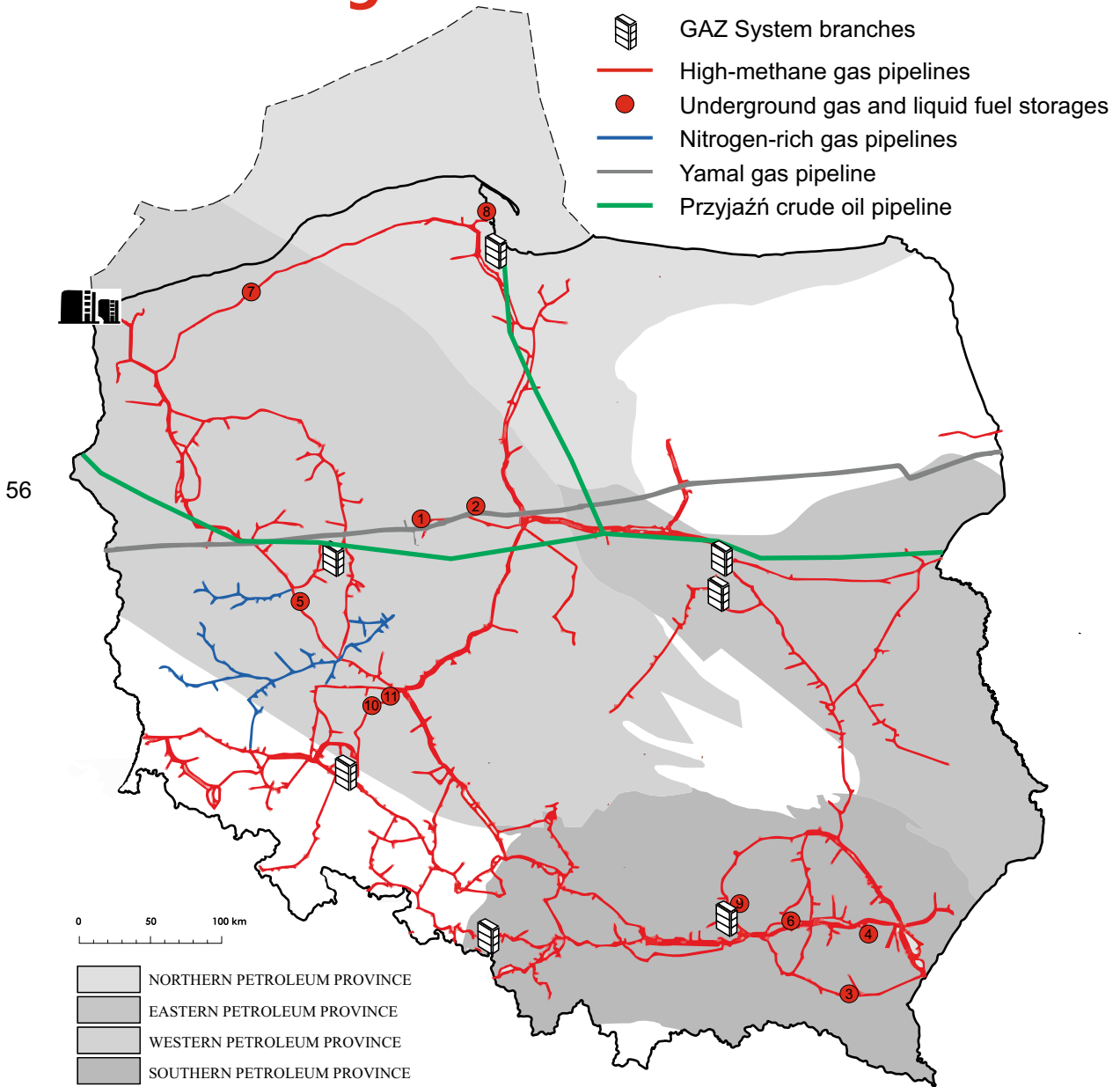
	FIELDS	FIELDS UNDER EXPLOITATION	EXPLOITABLE RESOURCES	PRODUCTION IN 2019	IMPORTS IN 2018	USE IN 2018
CRUDE OIL	87	57	22 649 kt	937 kt	26 847 kt	27 857 kt
NATURAL GAS	305	201	141 971 mln m ³	4 976 mln m ³	14 947 mln m ³	21 680 mln m ³

source: The balance of mineral resources deposits in Poland, Statistical Yearbook of the Republic of Poland

OIL AND GAS IN POLAND

2020-2021 INFORMATION
AND OPPORTUNITIES

Transmission and storage



source: en.gaz-system.pl,
PGI-NRI

Transmission and storage

Natural gas is transported through a grid of transmission and distribution pipelines that in total is 190,000 km long, including almost 11,000 km of gas transmission pipelines. Moreover, a 684 km-long transit section of the Yamal gas pipeline, connecting gas fields in the north of Russia with Western Europe, crosses the Polish territory.

A LNG (Liquid Natural Gas) terminal, commissioned in 2016, is in operation at Świnoujście. The capacity is 5 billion m³ of gas per year, and may be increased to 7.5 billion m³ - about 35% of the total gas requirements of Poland.

Crude oil is transmitted by two pipelines. The "Przyjaźń" ("friendship") pipeline is running from the Adamowo border crossing with Belarus to Schwedt in Germany. The Adamowo-Płock section is 234 km long (transmission capacity: approx. 43 million tonnes per year). The Płock-Schwedt section is 416 km long with a transmission capacity of 27 million tonnes per year). The reversible 237 km-long Pomeranian pipeline with transmission capacities of up to 1 million tonnes in the direction of Gdańsk and 28 million tonnes in the direction of Płock. The pipeline connects the "Przyjaźń" pipeline with Naftoport Terminal in Gdańsk.

Gas storage is primarily intended to enhance gas availability in the periods of a higher demand for gas, insofar as gas supply must remain stable throughout the year due to technology requirements.

There are 10 Underground Natural Gas Storage (UNGS) facilities in Poland, of which eight for high-methane gas and two for nitrogen-rich gas, with a total capacity of 3.5 billion m³ (as of 2019), which represents approx. 15.9% of the annual consumption. UNGS facilities act as strategic reserve by absorbing any surplus of supply in the summer and offsetting a higher demand in the winter. Crude oil is stored in surface tanks and in one underground storage.

Underground gas and liquid fuel storages

Location	Working capacity (million m ³)	Max. withdrawal rate (million m ³ /day)	Max. injection rate (million m ³ /day)
1. Mogilno II ^G	585.4	18.00	9.60
2. Góra ^{OF}	6	-	-
3. Strachocina ^G	360	3.36	2.64
4. Husów E ^G	500	5.76	4.15
5. Bonikowo ^G	200	2.4	1.68
6. Brzeźnica II ^G	100	1.44	1.44
7. Daszewo ^G	60	0.38	no data
8. Kosakowo ^G	239.4	9.6	2.4
9. Swarzów ^G	90	1.0	0.9
10. Wierzchowice ^G	1300	14.4	9.6
11. Henrykowice E ^G	100	no data	no data

^G - gas; ^{OF} - oil and fuels

source: en.gaz-system.pl,
PGNIG S.A.
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