



clean
energy
emerging
europe

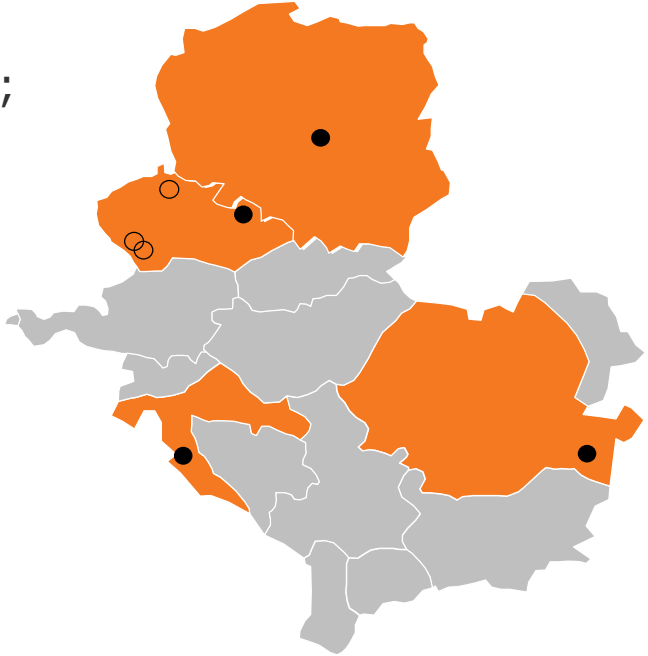
Romania's hydrocarbon resources: Black Sea focus

3rd SE Europe Hydrocarbons Upstream Workshop

Private equity
for clean energy projects
in central and south-eastern Europe

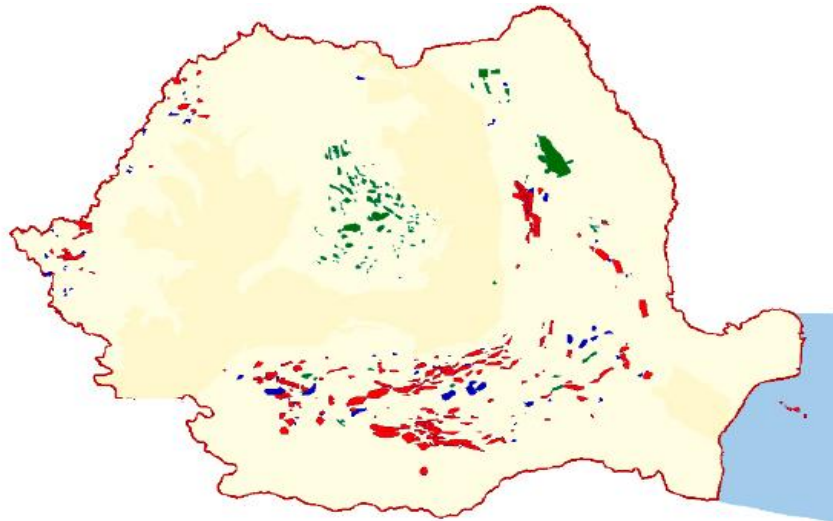
Introduction to EnerCap

- EnerCap manages over €450 mil of clean power generation assets, providing energy to over 200,000 homes and saving over 130,000 tonnes of carbon per year;
- The EnerCap Power Funds had over 300 MW in wind and solar projects in Czech Republic, Poland, Croatia and Romania;
- Initial focus of EnerCap was on Central and Eastern Europe as an “emerging market” in renewables, clean energy and energy efficiency and having to meet EU compliance standards;
- New focus: High efficiency cogeneration, G2P power plants;



Hydrocarbon resources in Romania

- Romania has traditionally been a hydrocarbons producer for more than a century;
- The country is the third most independent EU country in terms of energy resources (EC, 2014);
- Natural gas accounted for 27% of Romania's energy mix in 2017;
- Currently Romania explores & exploits about 400 oil & gas perimeters:
 - OMV Petrom - more than 200 (7 offshore fixed platforms) and delivered in 2017 about 50% from Romania's total gas consumption;
 - About 40 perimeters - by other companies (most of these perimeters are mature fields);
 - Romgaz (30% owned by Romanian Energy Ministry, explores the rest of the perimeters) and delivered in 2017 about 47% from Romania's total gas consumption;



*Map of conventional gas resources (offshore and onshore), in red resources exploited by OMV Petrom, in green by Romgaz and in blue by other companies
Source: Romanian Mineral Resources Agency*

Production

- In the second quarter of 2018, EU gas production was 28 bcm, 12% less than in the same period of 2017. Looking at the largest producers, gas output decreased in Denmark (-23%), Germany (-22%), Ireland (-12%), the Netherlands (-23%), **Romania (-4%)** and the UK (-6%);
- In 2017, domestic production accounted for 89.4% of Romania's gas consumption while the rest was imported; The Romanian Energy Strategy foresees a self sufficiency in terms of gas and estimates that the internal demand will be entirely covered by the production (104% in 2026);
- Its current production has decreased significantly. It has reached its peak in 1986 (39 bcm/year) and has been declining ever since to about 1/4 of that. The average annual production is 11bcm and the proven onshore reserves are constantly declining by about 5% per year, while the production is declining by 10% per year (PwC, 2013);
- The annual production capacity from the offshore perimeters is estimated at 4bcm per year;
- Investments are being made by the concessionaires of the production licenses to increase the recovery rate from the mature fields;

The Black Sea explorations: will it hold the label of 'The Next North Sea'?

- The Black Sea is crucial in the development of a cooperative energy security framework, with significant geopolitical importance and heavy leverage as a transit corridor for major infrastructure projects to supply EU member states;
- Significant challenges attached to exploring its potential and undertaking deep water oil and gas exploitations (capital intensive, adequate logistics is required to take necessary equipment to the exploration site, commercial risk, troublesome project management stages-spanning for decades, environmental and meteorological risk, geological risks, fiscal and regulatory risk);
- In 2009, the Romanian Mineral Resources Agency has put for concession 11 offshore blocks located in the Black Sea;
- **Success rate of 20-25%** for Romania in exploring potential:
 - OMV Petrom explores potential of hydrocarbons in several perimeters. It has partnered up with Exxon Mobil and made a significant deep water gas discovery (Domino-1- Neptun Deep) in 2012 located 170 km from the sea shore and estimated to hold between 42-84 bcm of natural gas resources, the equivalent to 3 to 6 times the annual consumption;
 - Lukoil, PanAtlantic and Romgaz have announced fall 2015 that they have discovered resources amounting to 30 bcm on Trident perimeter;
 - The Carlyle Group (Black Sea Oil & Gas) has confirmed 10bcm on Midia-Pelican perimeter;



Maps of Black Sea oil & gas perimeters (and companies exploring potential) on the Romanian side

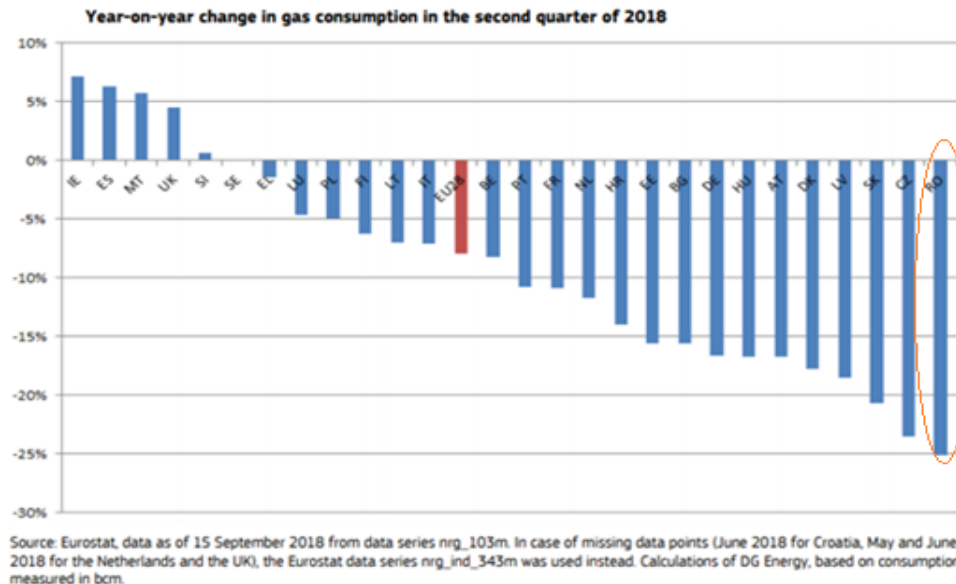
Source: Romanian Mineral Resources Agency

Regulatory framework

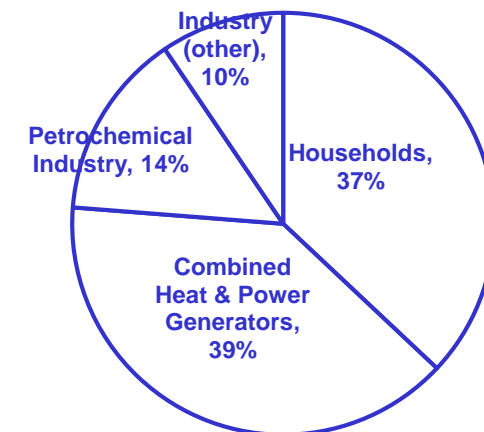
- Changes in the royalties system will enter into force fall 2018 following the expiry of a 10-year term (reached end of 2014) agreed upon in the privatization contract of the oil and gas company Petrom;
- Fiscal and regulatory risks are high due to the lack of stability and predictability (measures were applied without a minimum consultation with stakeholders, mainly debated in the media by key stakeholders, closed doors consultations);
- After the law was issued, several market participants (Black Sea Oil&Gas, OMV Petrom, Exxon Mobil) announced that they can't make an investment decision by end of 2018;
- *Key takeaways of the New Offshore Law:*
 - Producers are obliged to sell at least 50% of their output on the Romanian market; penalties for the producers will be 19% from their turnover;
 - Royalties are maintained for a period of 10 years at a level situated between 3.5-13.5% (levels that actually maintain the status quo); revenues to the central budget will be directed towards gas infrastructure projects;
 - Windfall tax on revenues above a cap which is the household price for year 2012 (imposed to set up a fund dedicated to carrying PPP-not necessarily in the energy sector);
 - Concessions are granted for 30 year with the possibility for extension for other 15 years;
 - It is estimated that the Romanian state will get about 44% of the total profits;
 - Eligible expenses are capped at 30% from the tax on revenues;

Consumption

- The Q2 DG Energy Report on European Gas Market shows that EU gas consumption decreased by 8% year-on-year, driven by mild weather and lower gas use in the power sector. The last time a year-on-year decrease of such a magnitude occurred was four years ago;
- The biggest year-on-year decrease was observed in **Romania (-25%)**, but 13 other countries also had a double-digit decline, including France (-11%) and Germany (-17%).
- This is due to warm weather, low industrial consumption, decreasing consumption of power plants, low storage levels – 40% below the capacity;



CONSUMPTION BY SECTOR, 2017, %



Infrastructure shock absorbers: Interconnections

- The CESEC ongoing priority gas projects are: the reinforcement of the Romanian transmission system (part of the "BRUA" corridor), *while other possible projects include: a connection of off-shore Romanian gas to the Romanian grid and enhancement of the national system;*
- Currently, there is no infrastructure in place to bring the gas on the Romanian (and implicitly on the European) market because there is no pipeline built from the sea shore of Black Sea trough Romania and most likely all the way to Hungary;
- The start of construction works on the Romanian section of the Bulgaria-Romania-Hungary-Austria (BRUA) project – June 2018;
 - Romanian TSO's share of investment in the project is estimated at EUR 560mn, which it hopes to cover through a bond-buying program and EU funding;
 - Project entails building a 550 km pipeline on Romanian territory, 3 compressor stations, and connect existing points of interconnection with the Bulgarian and Hungarian national gas transport grids;
 - The export capacity is estimated at 1.5 bcm/year towards Bulgaria and 4.4 bcm/year towards Hungary;
- The grid is connected with the neighbouring countries (Ukraine, Hungary, Moldova and Bulgaria) through 5 interconnection points; however, investments to make bidirectional flow possible are still needed; Strategic interconnection (supported by the EU) with Moldova and Bulgaria will help the countries reduce their import dependency;

Price convergence

- There are still significant differences in retail gas prices across the EU: in the second quarter of 2018, the estimated household price varied between 3.35 Eurocent/kWh in **Romania (lowest)** and 11.31 Eurocent/kWh in Sweden, resulting in a price differential ratio of 3.4 between the cheapest and the most expensive Member State. This ratio gradually decreased since March 2012 when it reached 4.8;
- The low gas price does not send the correct signals for the investors and erodes investors in general / electricity generators' capacity to invest in long term (strategic) projects;
- Market driven measures are still in the process of being set up (liquid markets for trading gas, the market for households is still in the process of being fully liberalised, the new Offshore Law references a cap/regulated prices; it is a concentrated market with only two producers holding more than 90% of the market);
- Reforming the energy sector in Romania was a slow process mainly for populist reasons. Maintaining regulated prices and keeping them in the hands of political parties has acted as the main bargaining chip during election times;
- A low oil price and a regional trend of cutting exploration budgets, as well as unpredictability of the fiscal and regulatory system in Romania are likely to lead to a reconsideration of companies' plans in relation to Black Sea projects;

Plusses: Why are we looking as investors at gas

- Relatively high availability of domestic resources, reduced environmental impact as compared to other conventional sources and the ability to balance the electricity generated from the intermittent RES - this positions gas among the preferred energy resources in country's fuel mix;
- New explorations are most likely to lead to new discoveries, however, these require paramount development costs;
- The existing infrastructure for extraction, transport, underground storage and distribution is in place, however investments are still needed to market the offshore resources;
- Romania has a favourable position towards the transport capacities in the region and the possibility of interconnecting its grid with the European Central Transport Systems and with the gas resources of the Caspian Basin, the Eastern Mediterranean and the Middle East; this will facilitate stronger regional market integration;

Key challenges for Romanian hydrocarbon resources

- The onshore reserves are mainly trapped in mature oil fields which are in need of cutting edge technology with the aim to increase their productivity and recovery rate;
- Resources should be mapped using today's technology so that we could paint a clear picture regarding the availability of resources;
- Companies are facing regulatory, financial and technical difficulties in carrying the investment and exploring potential of the Black Sea resources;
- Gas infrastructure is missing – barrier to bringing the offshore resources on the European market;
- Building a liquid gas trading platform;
- Dropping artificial, regulated prices - low kept gas prices do not justify a continuation of investments.

Prerequisites for an investor

- Gas market liberalization;
- Functional, liquid trading platforms (convergence with other major trading hubs);
- No regulated / artificial prices that distort the market and send wrong signals to investors;
- Interconnection and major infrastructure projects;
- Continue IPOs;
- Strong corporate governance principles implemented in the SOEs, with independent boards and professional management;
- Regulatory predictability (including the fiscal sector, taxation, tariffs, bonus schemes);
- Predictability & Accountability in terms of Energy Strategy (long term energy mix based on energy modelling regarding supply & demand, bonus schemes in place to promote certain technologies, Romania's role in the regional context-infrastructure, following the priorities set at EU level while adopting them to the local context);
- Transparency (clear rules, access to relevant documents, consultation, better monitoring from watchdogs, in particular Energy and Competition Agencies);

Thank you for listening

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