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Romania's Post-Nabucco Energy Security Options

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Romania's Energy Strategy for 2007-2020

For **natural gas**, midterm measures (till 2013) to enhance energy security:

- Support for **Nabucco** project;
- **Interconnections** with the neighboring countries: Hungary (Arad-Szeged), Bulgaria (Giurgiu-Ruse), Ukraine (Siret-Cernauti);
- Increased underground **storage** capacity.

Longer term (till 2020):

- Interconnection Romania Moldova + underground storage at Margineni.
- Multiple interconnections with Ukraine.

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Southern Gas Corridor:
Nabucco West lost to TAP (June 2013)

- **TAP (Trans-Adriatic Pipeline)**:
  - From Komotini (Greece) across Albania and the Adriatic Sea to San Foca (Italy); 879 km, of which 105 km offshore
  - Shareholders: Axpo (Switzerland), 42.5%; Statoil 42.5%; E.ON, 15%.
  - 10-20 bcma, scalable; 48 inches
- **TANAP (Trans-Anatolian Pipeline)**
  - 10-30 bcma, scalable; about $10 bln
  - planned to cross Anatolia to the Bulgarian border
  - SOCAR 51%; Botas & TPAO 20%; BP 12%; Statoil 12%; Total 5%
- **Shah Deniz 2**

  25 bcma as of 2019

  10 bcma available to EU markets

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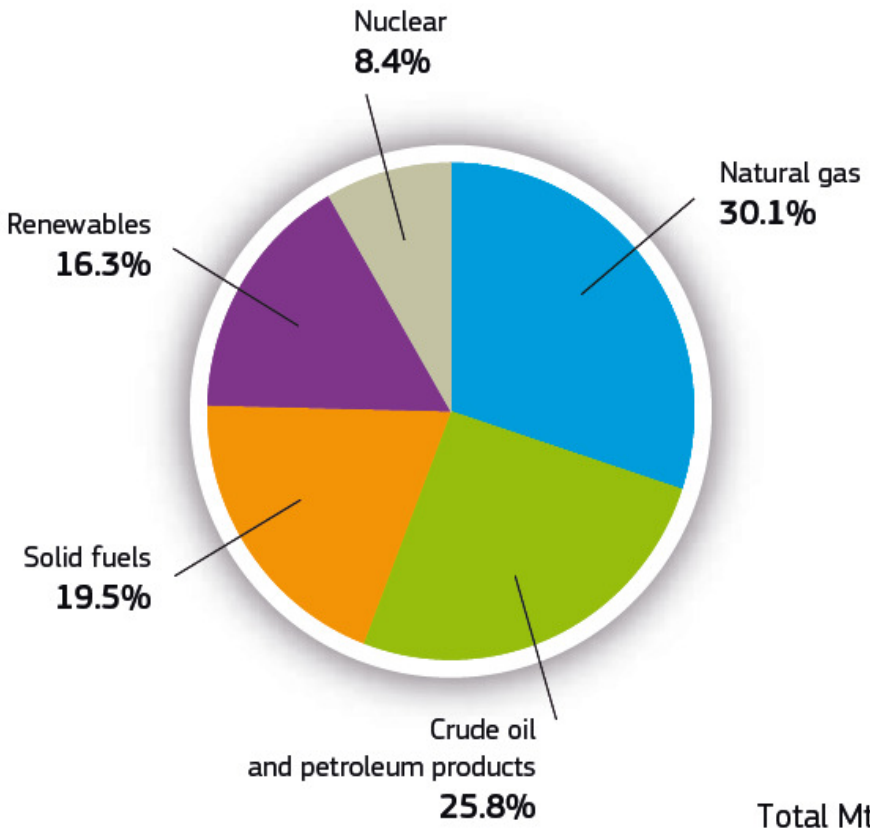
Current status

- Nabucco was Romania's main foreign energy policy project
- After Nabucco, Bucharest has been left without any major international energy project
- Gas production (2012): 10.9 bcm; consumption: 13.5 bcm
- Oil production (2012): 4.1 mil tons; consumption: 8.8 mil tons
- Proved conventional gas reserves (2012): 100 bcm
- 10% aggregate yearly depletion rate for hydrocarbons
- Oligopolistic regional natural gas market

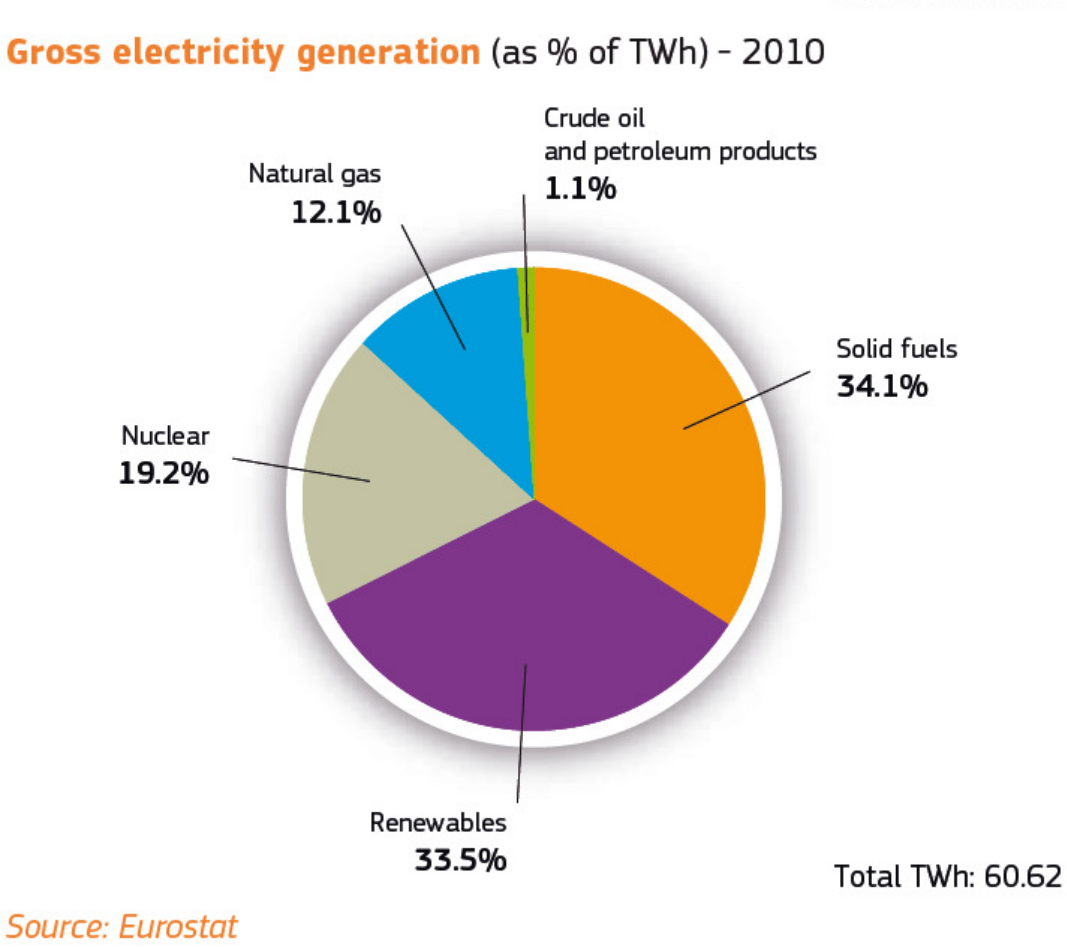
Romania's energy mix

Gross inland consumption (as % of total Mtoe) - 2010



Total Mtoe: 35.71

Electricity mix



Average Price of Gas Sold by Gazprom in Europe in the First Half of 2012 (USD/tcm) (source: *Izvestia*, Feb. 1, 2013)

Western Europe and Turkey	
• UK	313.4
• Netherlands	371.4
• Germany	379.3
• Finland	384.4
• France	393.8
• Austria	394.7
• Turkey	406.7
• Italy	440.0
• Switzerland	442.2
• Greece	476.7
• Denmark	495.0
Eastern Europe	
• Hungary	390.8
• Slovakia	429.0
• Romania	431.8
• Serbia	457.3
• Slovenia	485.6
• Bulgaria	501.0
• Czech Republic	503.1
• Bosnia & Herzegovina	515.2
• Poland	525.5
• Macedonia	564.3

Natural gas options

- **Prospective domestic sources:**
  - Enhanced recovery rate in conventional wells (Petrom & Repsol)
  - Shale gas resources (Chevron et al)
  - Black Sea offshore (Exxon, OMV, Sterling, Romgaz)
- **Potential new external suppliers:**
  - Shah Deniz 2 gas, through a Greek-Bulgarian connection
  - Levantine Basin – LNG supplies, via Greece
    - Israel, Cyprus, Lebanon – estimated 1.5 Tcm recoverable resources
  - Omisalj LNG terminal on Krk Island, Croatia
  - Swinoujscie LNG terminal, Poland
    - North-South corridor; Objective: connect gas supply sources of the Baltic, Black, and Adriatic Sea.
  - Baumgarten (CEGH) – Russian gas!

Keyword: **uncertainty**!

Domestic:

- Increased well productivity: relatively safe bet, but high investments needed; the promise of new technologies for mature fields
- Shale gas…
- Offshore: Domino 1 significant, but more finds are expected in order to catalyze investments; importance of distinct royalty frameworks for different O&G production technologies

External:

- Mutual competition between the potential suppliers + uncertainty about development deadlines (e.g., conflicting territorial claims in the Eastern Mediterranean); on the other hand, evolving technologies may speed up the process (e.g., LNG regasification onboard of tankers).
- The EU market dynamics until 2020 may be decisive to the development of various supply chains; EU regulations will be important: ETS for CO2, RES support schemes, increase of energy efficiency

Difficult, at this point, to see beyond 2020. South Stream a complicating factor for Eastern Europe energy planning!

EU supported interconnectivity needed under any circumstances!

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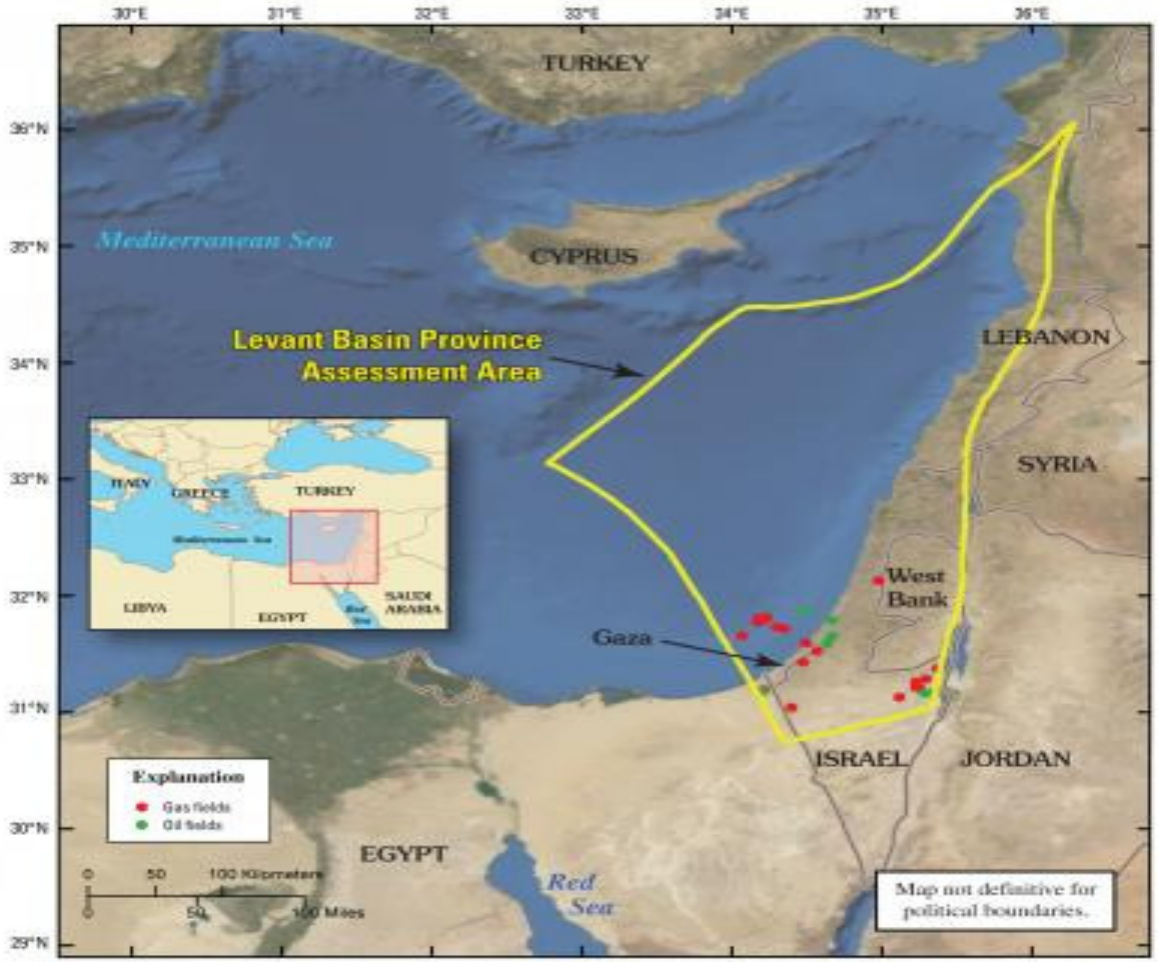
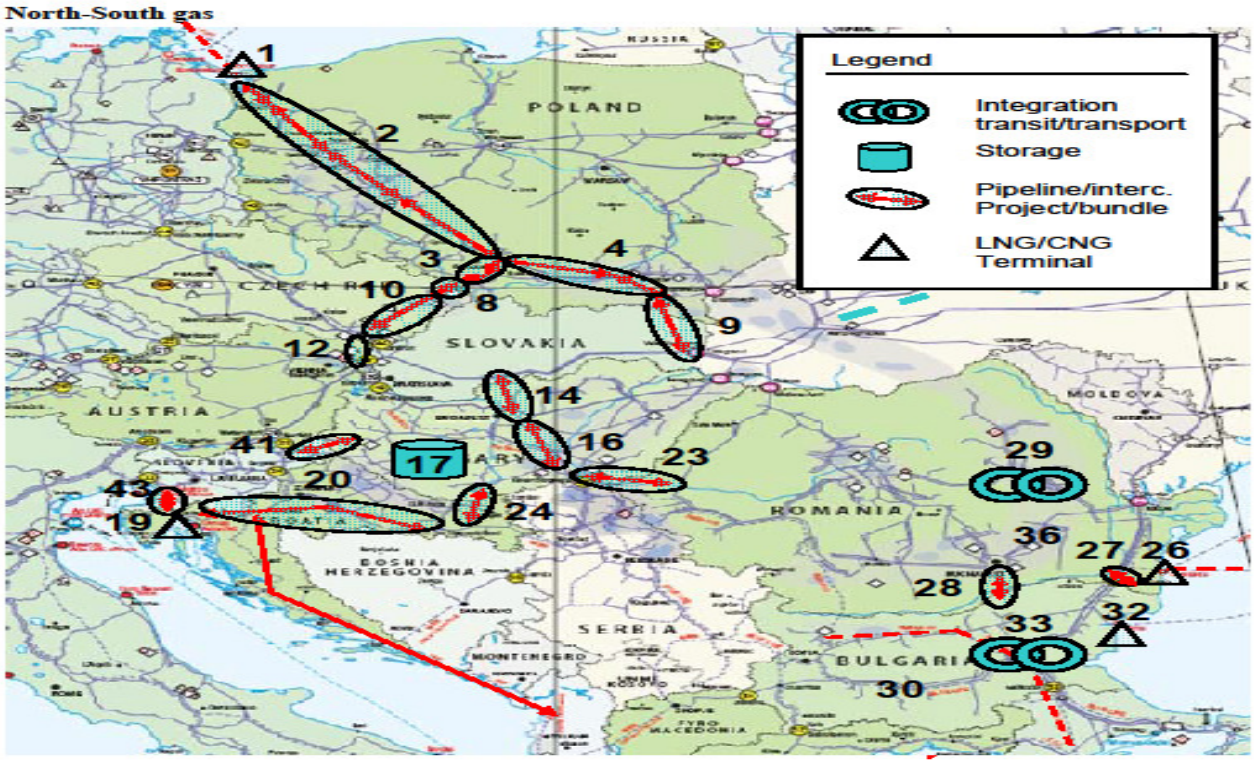
Levant Basin




North-South gas
Legend
Integration transit/transport
Storage
Pipeline/interc. Project/bundle
LNG/CNG Terminal
POLAND
CZECH R.
SLOVAKIA
AUSTRIA
HUNGARY
ROMANIA
MOLDOVA
BULGARIA
SERBIA
MONTENEGRO
BOSNIA HERZEGOVINA
CROATIA
SLOVENIA
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6.15. Cluster Integration of the transit and transmission system and implementation of reverse flow in Romania, including the following PCIs: 6.15.1 Integration of the Romanian transit and transmission system 6.15.2 Reverse flow at Isaccea	Works within GMS Isaccea and the upgrade (amplification) of Compressor Station Silistea. The project also implies the construction of a connection pipeline between the DN 1000 Pipeline (Transit 1 Bulgaria) and the NTS with a daily capacity of 14 MCM/day and with the possibility to meter the natural gas volumes transmitted in both directions.	**Gas EAST**
6.20. Cluster increase storage capacity in South-East Europe, including one or more of the following PCIs: 6.20.1. Construction of new storage facility on the territory of Bulgaria 6.20.2. Chiren UGS expansion 6.20.3. South Kavala storage in Greece **6.20.4. Depomures storage in Romania**	6.20.4.: Extension of storage facility in depleted field in Depomures, with the following technical characteristics: Working Gas Volume 600 (300 existing + 300 new) MCM; Withdraw capacity 6 (2 existing + 4 new) MCM/day; Injection capacity 6 (2 existing + 4 new) MCM/day; Cycling rate 1 times/year.	**Gas EAST**
6.22. Cluster Azerbaijan–Georgia–Romania Interconnector project, including the following PCIs: 6.22.1. Gas pipeline Constanta (RO) – Arad – Csanádpalota (HU) [currently known as AGRI] 6.22.2. LNG terminal in Constanta (RO)	Upgrade and extension of the AGRI pipeline between Constanta, Arad (RO) and Csanádpalota (HU), with sections both onshore and offshore. LNG terminal in Constanta (RO).	**Gas EAST**
7.1. Cluster of integrated, dedicated and scalable transport infrastructure and associated equipment for the transportation of a minimum of 10 bcm/a of new sources of gas from the Caspian Region, crossing Georgia and Turkey and ultimately reaching final EU markets through two possible routes: one crossing South-East Europe and reaching Austria, the other one reaching Italy through the Adriatic Sea, and including one or more of the following PCIs: 7.1.1 Gas pipeline from the EU to Turkmenistan via Turkey, Georgia, Azerbaijan and the Caspian [currently known as the combination of the "Trans Anatolia Natural Gas Pipeline"	7.1.5.: New onshore pipeline with a length of 1318 km and with the following daily delivery capacity of 6.1 MCM/day in Bulgaria, 6.1 in Romania, 6.1 in Hungary and 52 in Austria. Initial throughput capacity of 23 BCM/year. The power of the compressor station(s) amount to a total of 345 MW.	**Southern Gas Corridor (SGC)**

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AGRI

- LNG link from SD over Georgia and the Black Sea to Constanta.
- Planned LNG terminal at Kulevi and regazification at Constanta.
- Up to 7 bmca at a cost of $2-6 bln.
- Shareholders: SOCAR, Romgaz, Georgian Oil and Gas Corporation, MVM (Hungary).
- Feasibility study done by Penspen

However, project unlikely to be done in the next ten years, if at all

- Restriction of LNG tankers through the Bosphorus
- Consortium unlikely to have the financial means for terminals and carriers.
- No available gas source as yet

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South Stream

- South Stream launched officially on December 7 at Anapa, on the Russian Black Sea coast.
- Gazprom owns a 50% stake in the consortium that will build the subsea section, along with Eni (20%), EDF (15%), and Wintershall (15%).
- South Stream has secured transit across Bulgaria, Serbia, Hungary, Slovenia, and into Austria and Northern Italy, through the Trans Austrian Gas Pipeline.
- Additional storage in Serbia will ensure delivery to Bosnia and Herzegovina.

PLANNED SOUTH STREAM ROUTE

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- Planned 63 bcma by 2019, at €16 billion (revised down from initial €25 billion).
  - 15.75 bcm in 2015 – enough by itself to preempt the Southern Corridor!
  - 31.5 bcm in 2017
  - 47.25 bcm in 2018
- **Source**: natural gas diverted away from Ukraine's pipeline system.
- Key factor: **timing!**

South Stream's implementation will depend on its ability to preempt SEE markets from closing long term contracts (LTCs) with new suppliers.

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Gazprom "excess capacity" strategy

Russia's export capacity to Europe is already 244 bcma, while Gazprom exported to Europe + Turkey only 138.8 bcm in 2012, down from 150 bcm in 2011 (*Platts*).

With South Stream, two more Nord Stream lines, and the recently announced Yamal 2 (from Belarus to Slovakia via Poland), Russian pipeline export capacity to Europe would reach 377 bcma.

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Structural challenges to Gazprom's business model

1. **Slumping European gas demand**
2. **Shale gas upsurge and global LNG trade.**

   In the scenario of a US shale gas export boom by 2020 + other LNG supplies, Gazprom's EU market share will be seriously affected; but so will be the SGC, with its modest volumes

3. **Liberalization and gradual integration of EU gas markets (Third Energy Package)**
4. **Dispute with EC competition authorities**
5. **Domestic competition**

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