Joint Research Centre

the European Commission's in-house science service

Serving society
Stimulating innovation
Supporting legislation

DG – JRC supporting and training activities for MS and CP

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Unit C3 “Energy Security, Distribution and Markets”
JRC Directorate – Energy, Transport and Climate

Ljubljana, 19 September 2017

European Commission

Content

1. Why support and training on Reg. (EU) No 994/2010?
2. Past experience
3. Training structure and tools
4. Data needs
5. Conclusions

European Commission

The JRC inside the European Commission

President
Jean-Claude Juncker

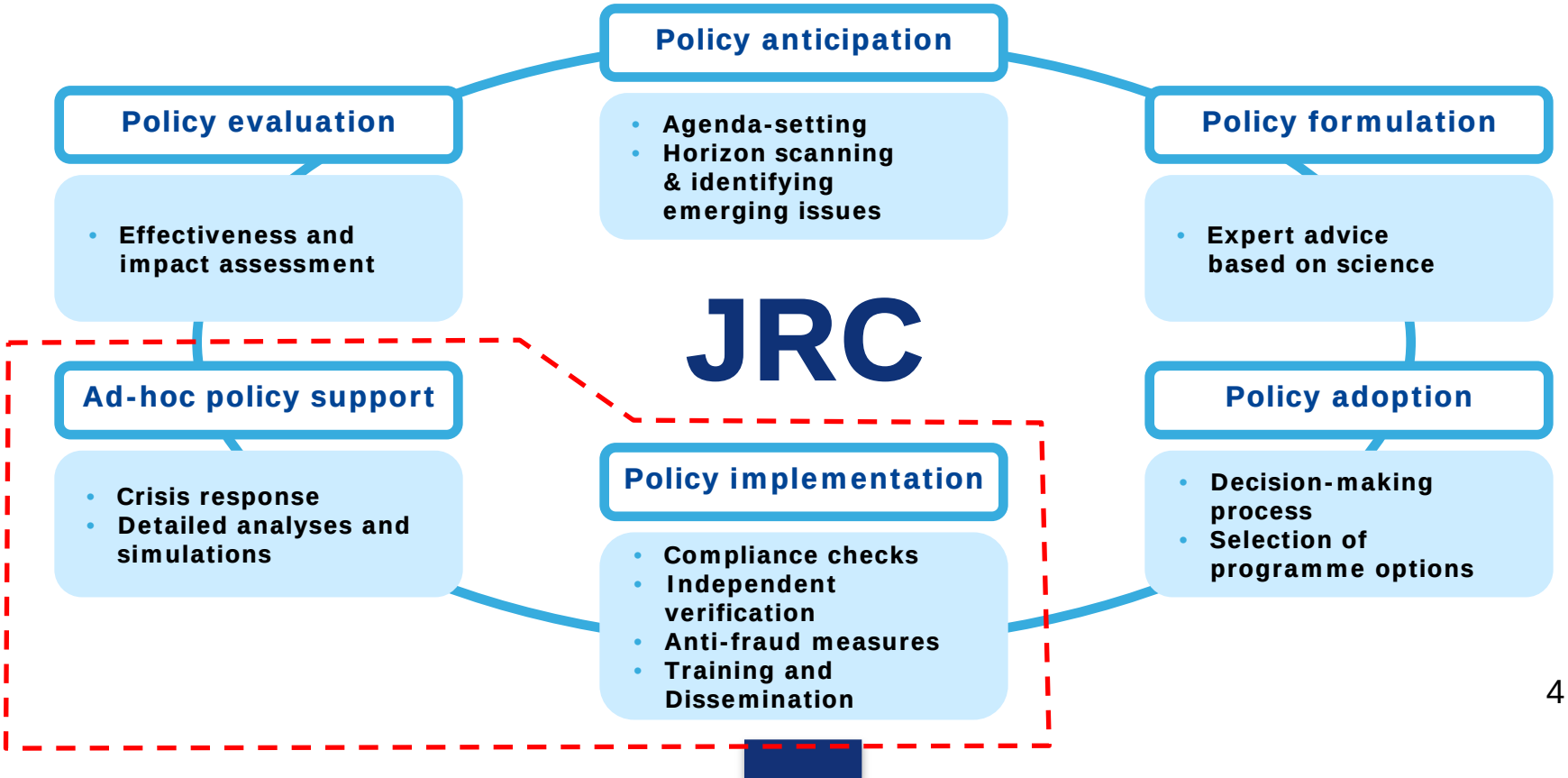
27 Commission Members

Commissioner
Tibor Navracsics
Education, Culture, Youth and Sport

Director-General
Vladimír Šucha
Joint Research Centre

DG Research & Innovation (RTD)

Implementing the JRC Mission in the EU Policy Cycle



C3: our pipeline

Customers

- DG-ENER
- DG-HOME
- MS (FI, LV, LT, EE, EL, BG, RO)
- Other Countries (UA, RS, FYROM, BH)
- Energy Community

Activities

- Modelling
- Assessment
- Review
- Training
- (Research)

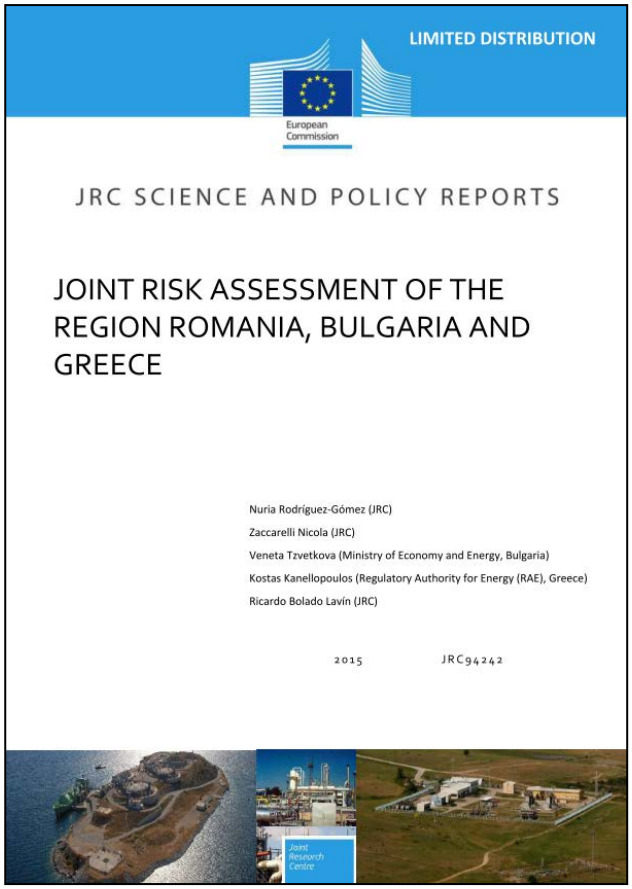
Tools

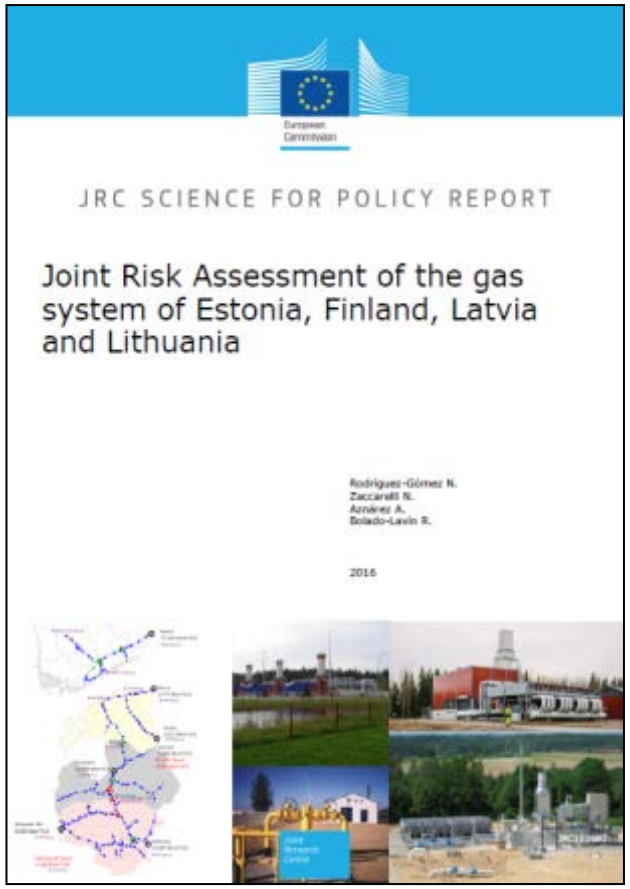
- EUGas
- SAInt (module)
- GEMFLOW
- ProGasNet
- "Experience"
- Techno-Economic

Policy

- Reg. 994/2010
- Reg. 347/2013
- Directive 2008/114/EC
- LNG & UGS strategy
- Energy Union

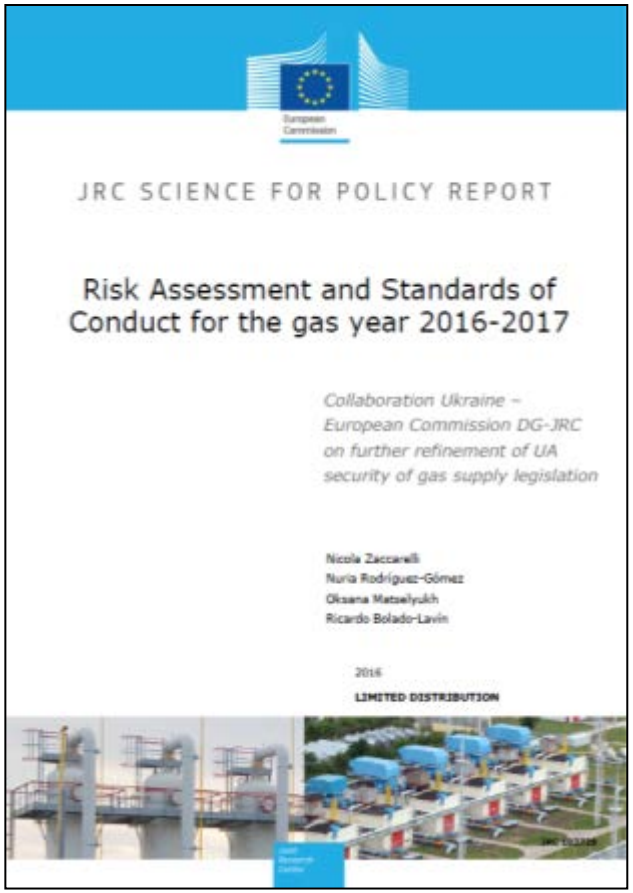
Experience in supporting Member States in the Risk Assessment exercise





N.B. CONFIDENTIAL DOCUMENTS

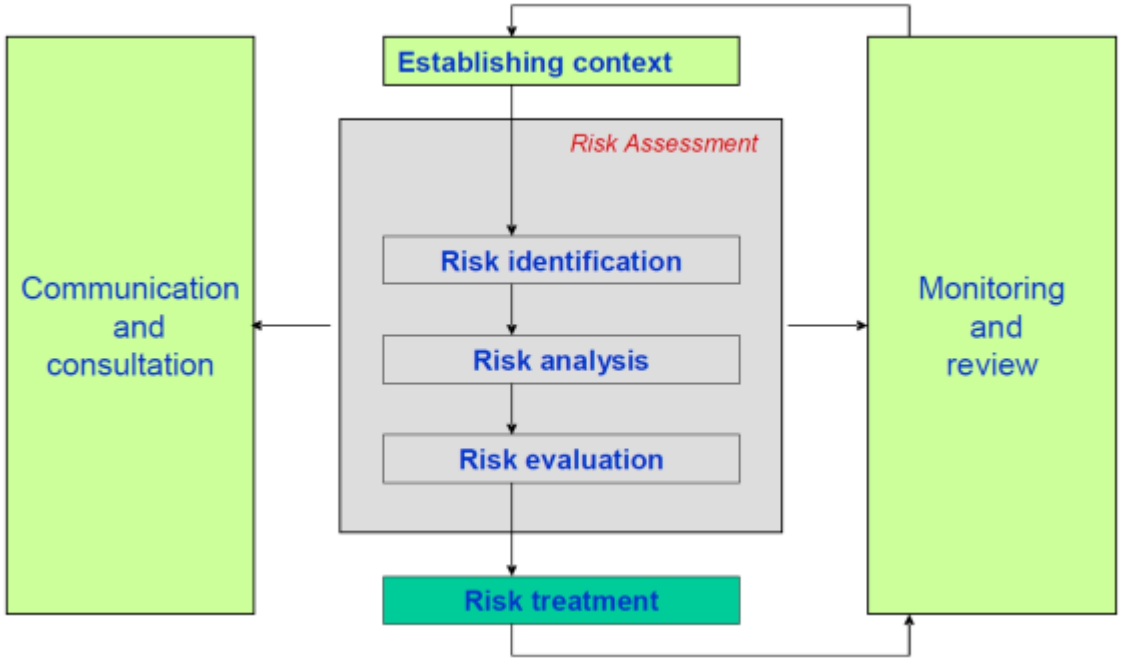
Experience in supporting Contracting Parties in the Risk Assessment exercise



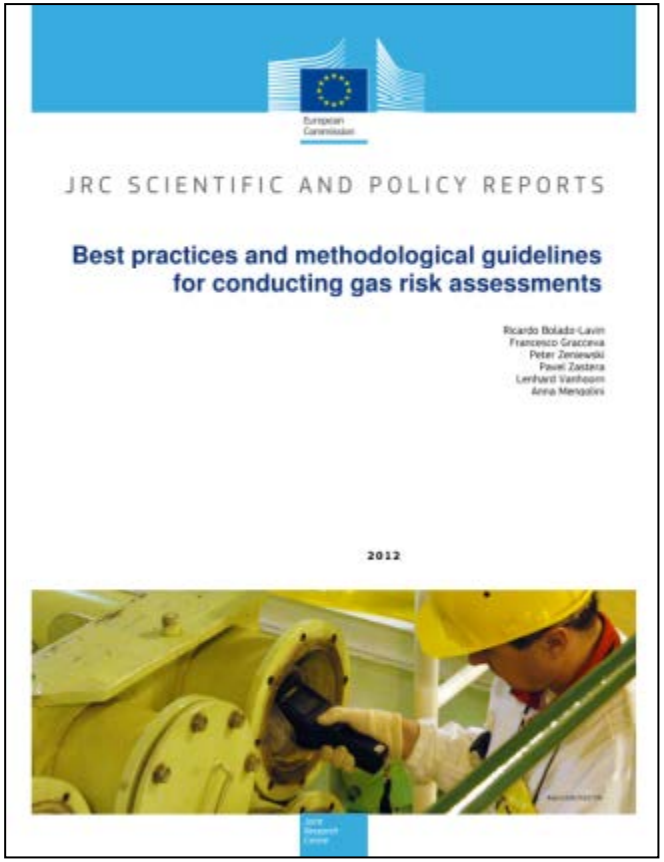
N.B. CONFIDENTIAL DOCUMENTS

Methodology of a Risk Assessment

- Based on the approach of the ISO 31000 and DG-JRC Guidelines;



ISO 31000:2009 Risk Management



Available at
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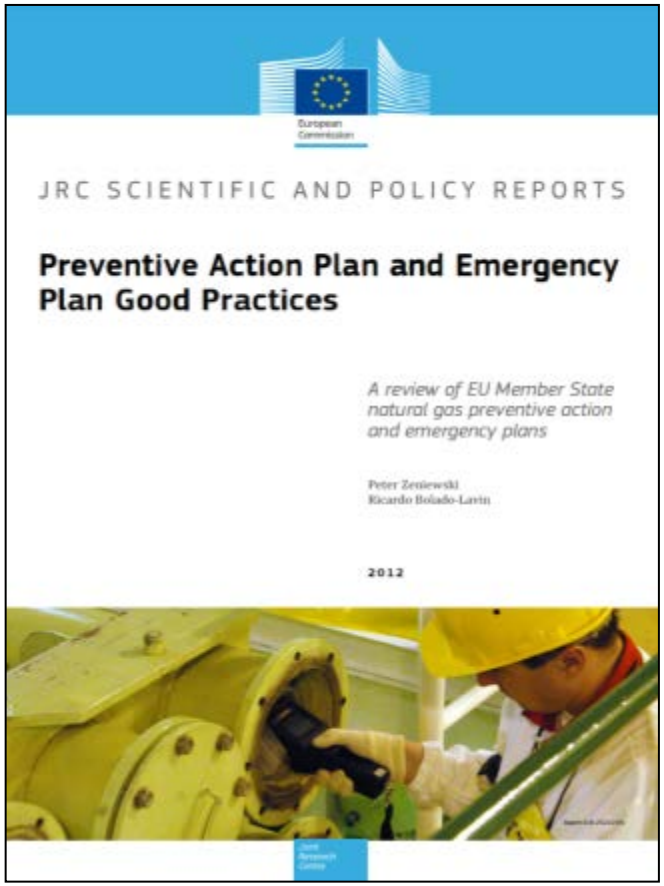
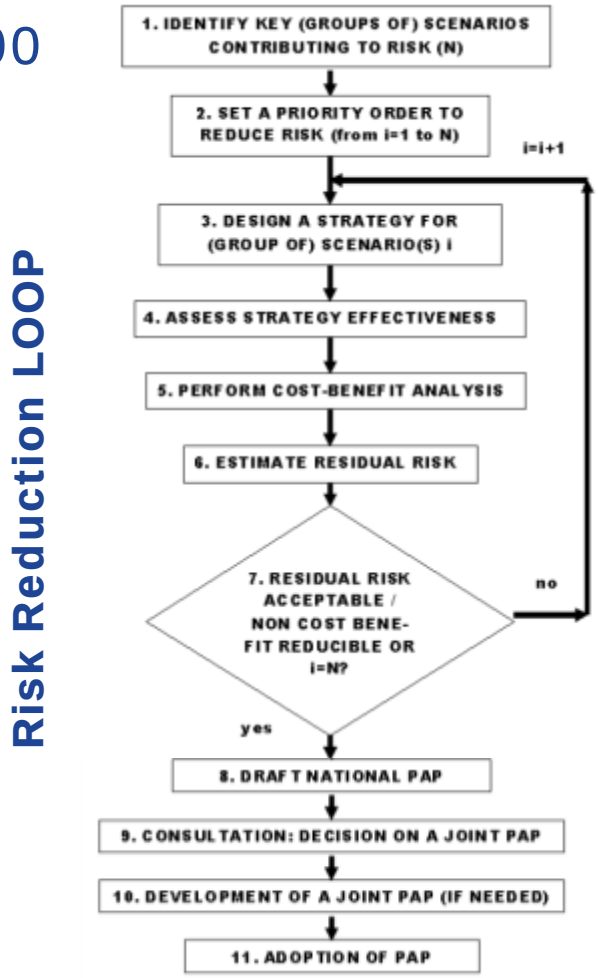
Methodology of a PAP and EP

- Based on the approach of the ISO 31000 and DG-JRC Guidelines;





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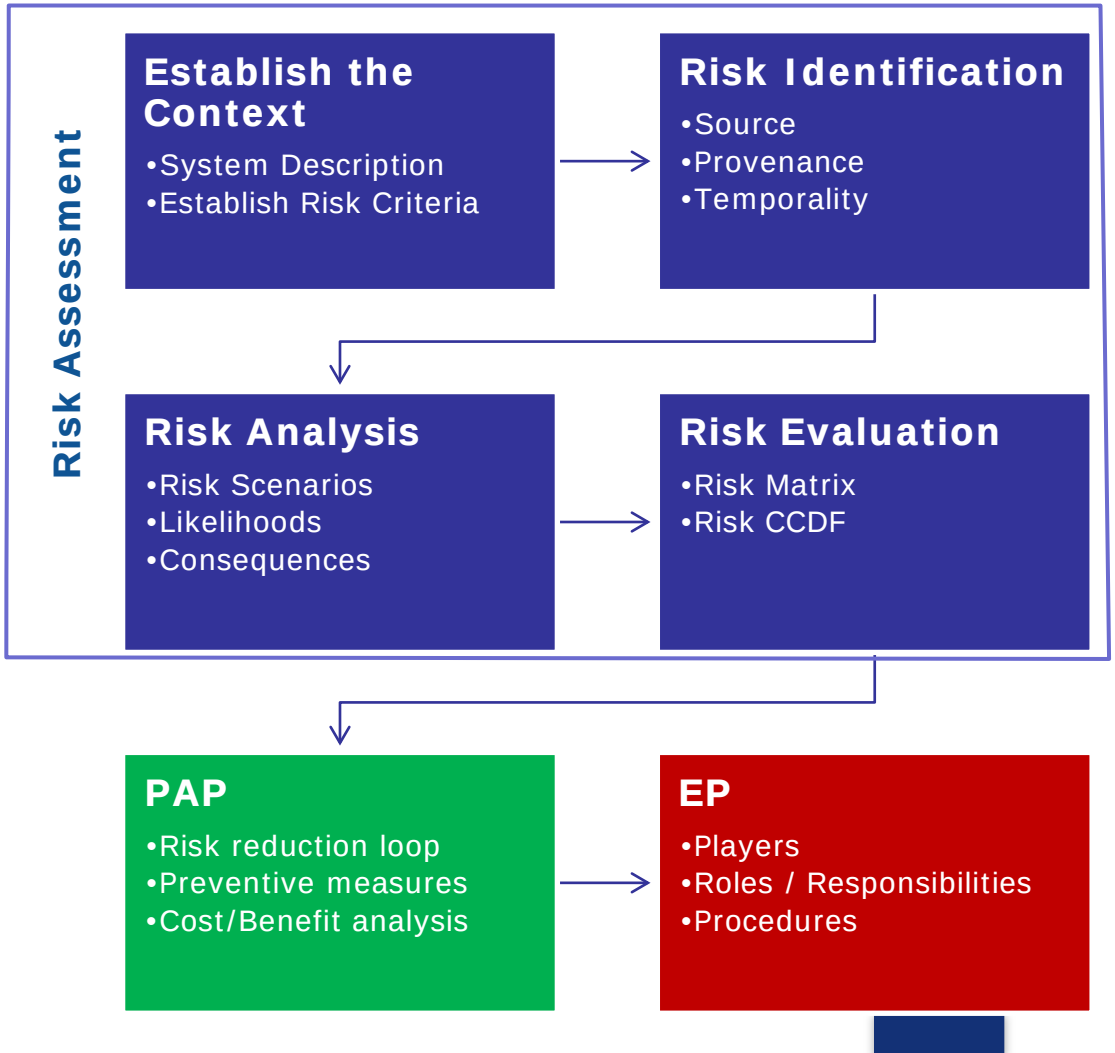
Past training experiences

- 2011 October, Dubrovnik, Croatia
- 2012 October, Dubrovnik, Croatia
- 2013 November, Athens, Greece
- 2014 November, Athens, Greece
- 2015 October, Istanbul, Turkey
- 2016 June, dedicated training for Ukraine

Training structure



- Content / Requirements Reg. (EU) No 994/2010
- Experience from MS (invited speakers)
- Exercises
- Case studies / Examples

TOOLS: What is EUGas?

EUGas is an ongoing effort to develop a country scale steady state hydraulic model of national gas transmission systems.

EUGas is a unique tool and no comparable projects exist in Europe (i.e., only few countries use hydraulic models like in the NDP of Germany or the RA of Ireland).

Each Transmission System Operator has at least (i) a steady state hydraulic model for network development and capacity planning and (ii) a transient hydraulic model for network management (coupled with SCADA).

Competent Authorities (Reg. (EU) No 994/2010) may not have such tools for they activities.

EUGas History

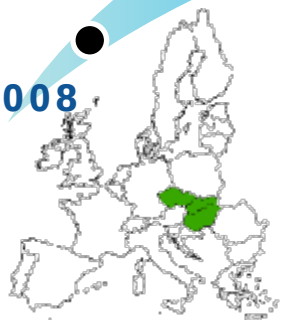
Phase 1
- Hydraulic Module
- Pilot Study

Phase 2
- GIS Module
- Hydraulic Module
- Estimated values for demand
- Simplified Network Topology

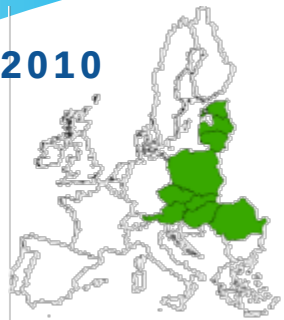
Phase 3
- GIS Module
- Hydraulic Module
- Real/Estimated demand
- Complex Network Topology
- Scenarios

Phase 4
- Scenario module
- Templates
- Allocation procedure
- Networking with TSOs and MSs for data exchange

2008

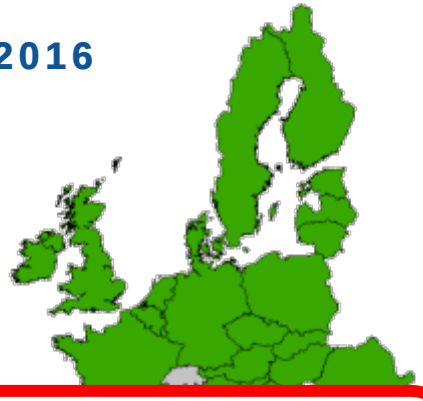


2010



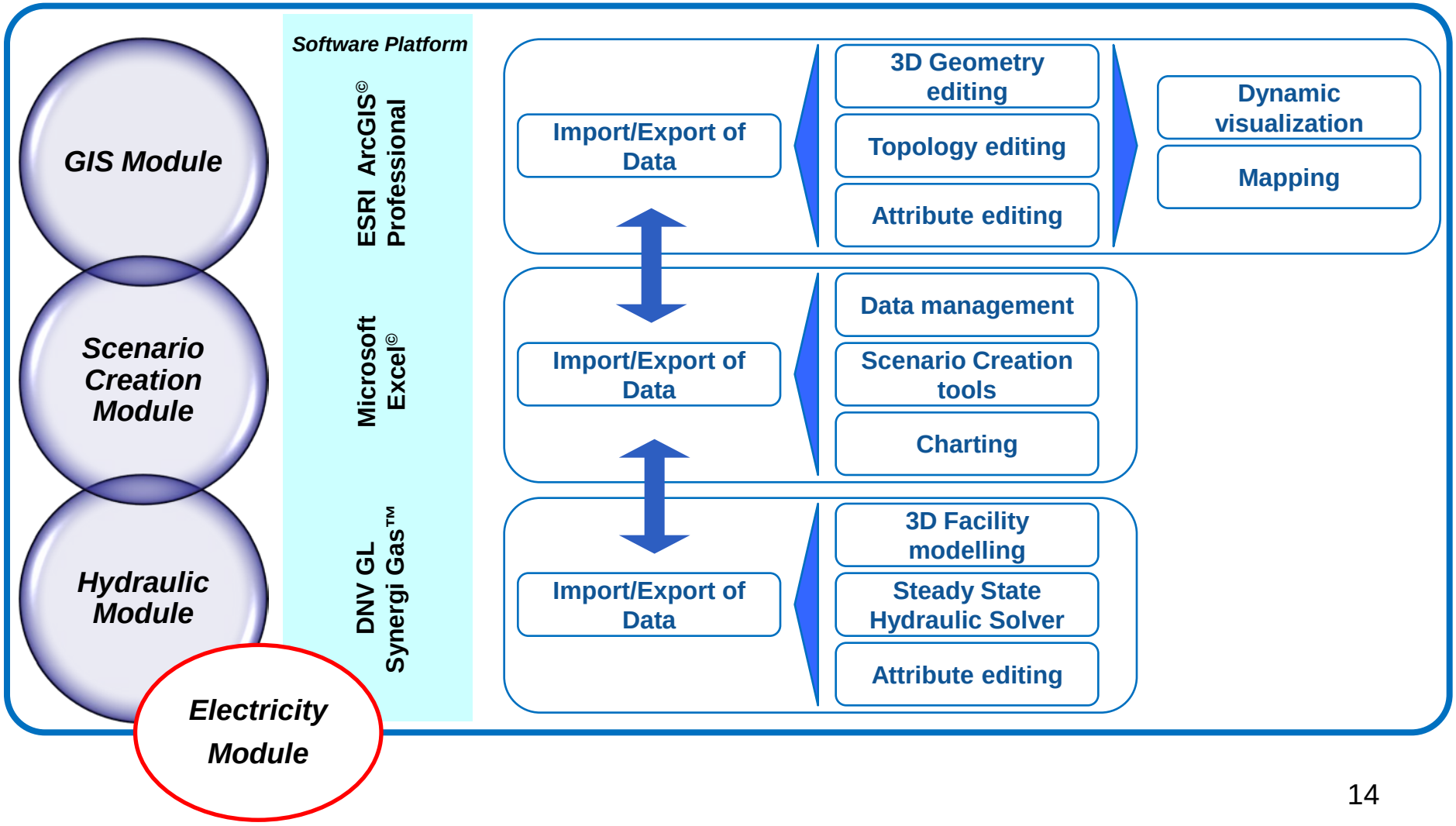
2013

2016



Phase 5 (on-going)
- Gas / Electricity interaction
- Dynamic models

EUGas Structure



What EUGas models:

European Commission

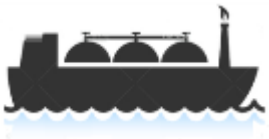
Infrastructure

Pipelines

Comp
Stati

Transmission

round
rages



LNG
Terminals

Prod
Sites

Production

Nodes

Consumption

Cross-border
points

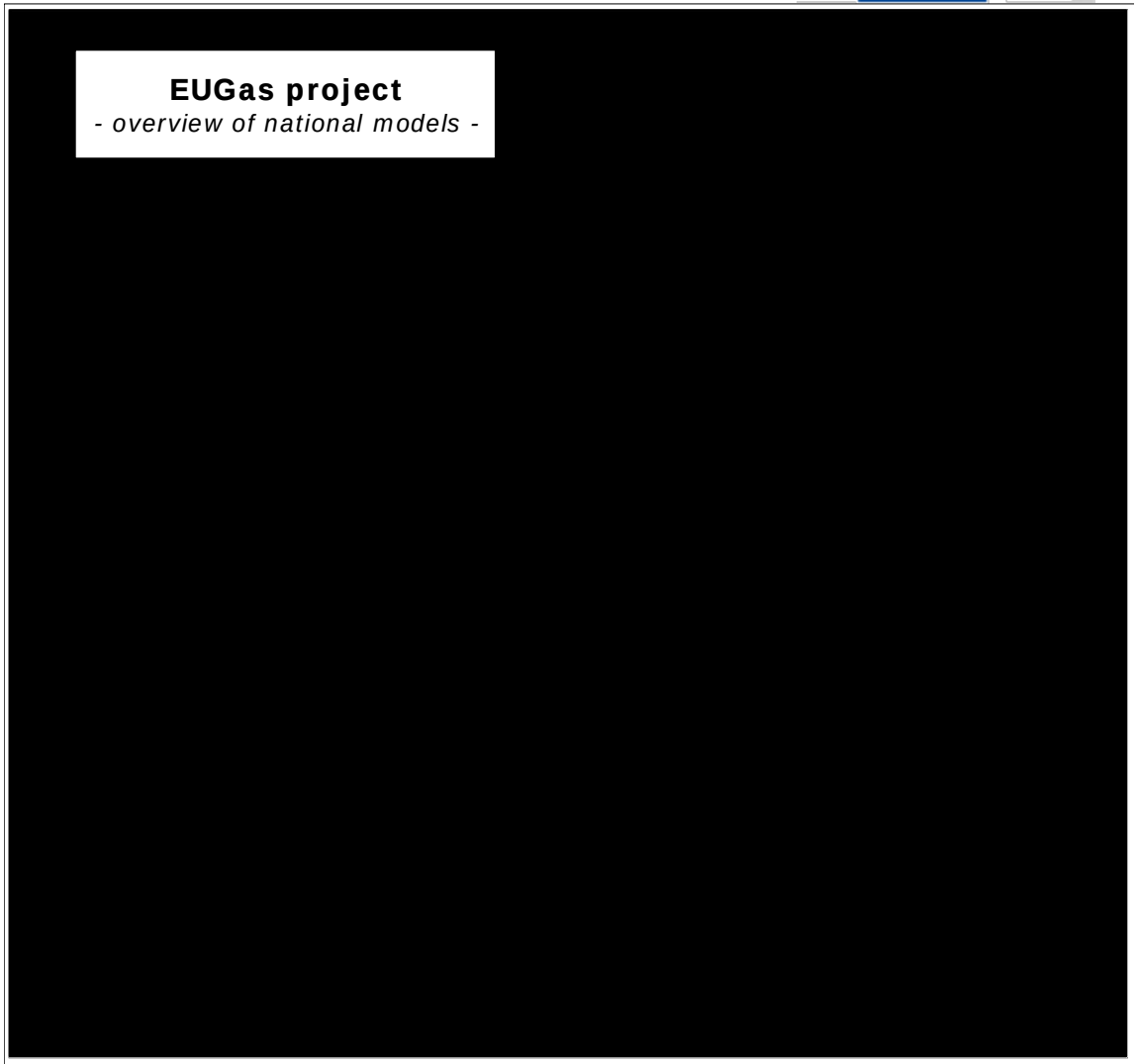
Domestic / Commerce
off-take

Industry off-take

District Heating
off-take

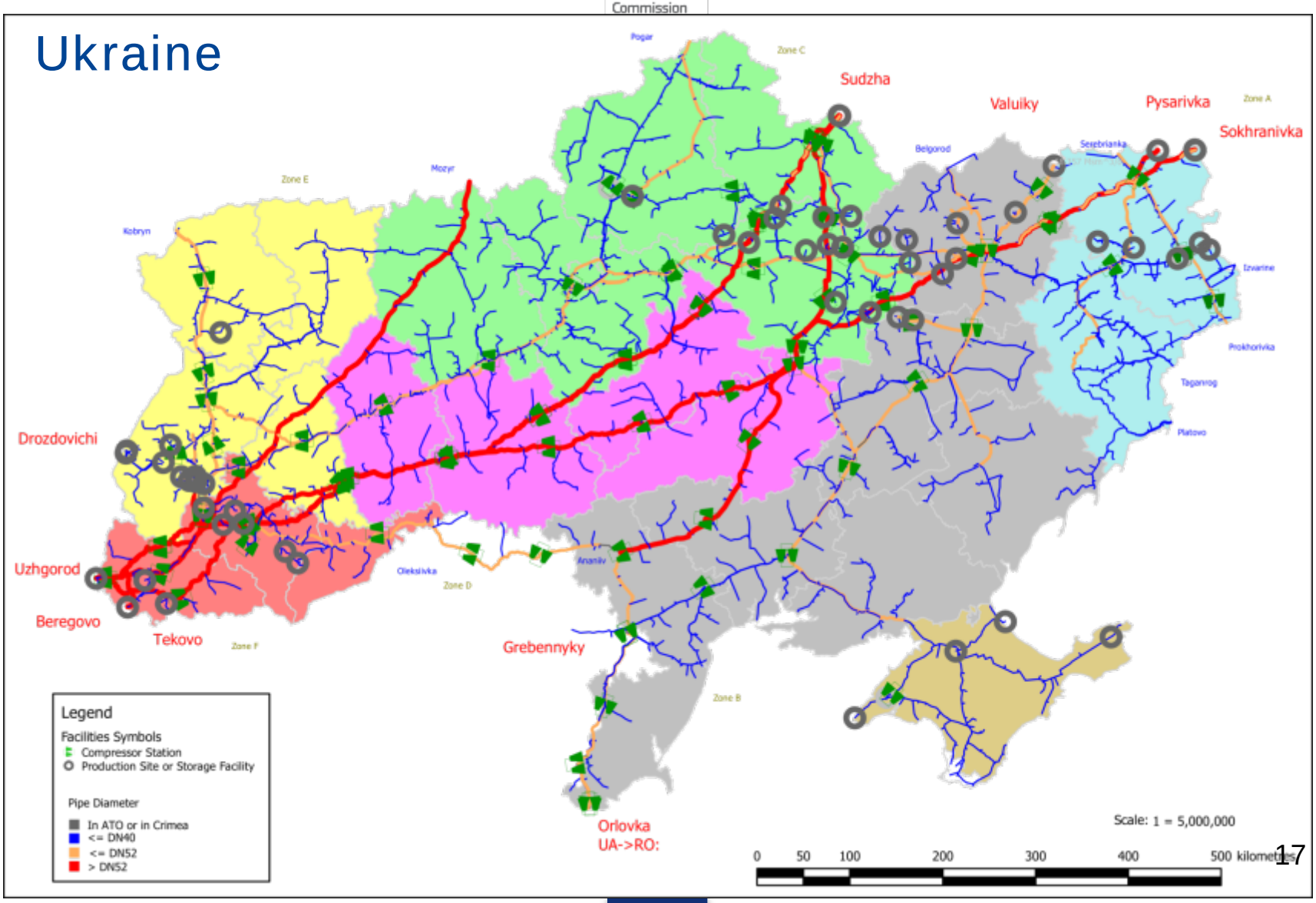
Electricity Production
off-take

EUGas extent



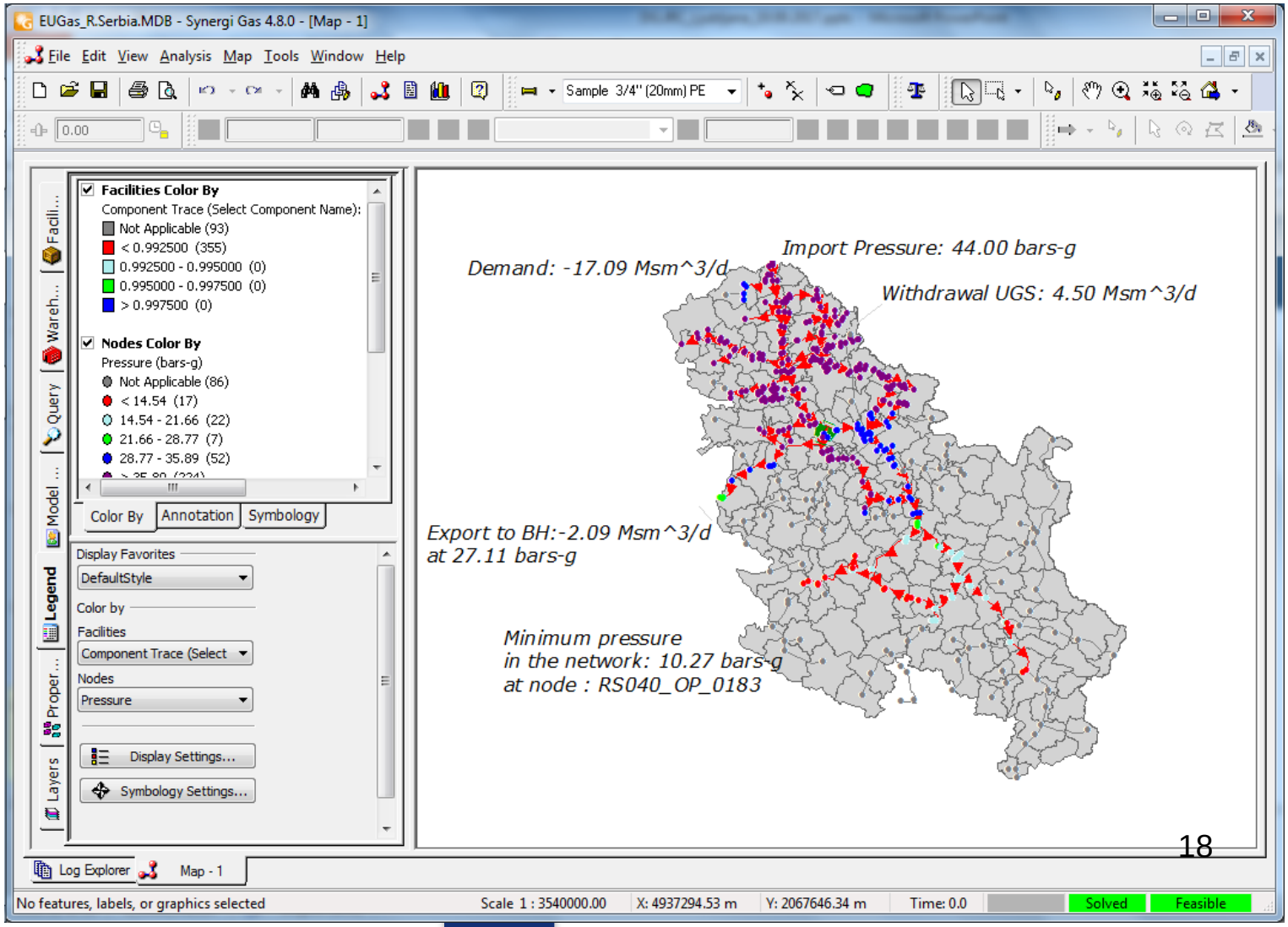
146 UGS
217 Compressor Stations
22 (+2) LNG
~16.500 Pipeline segments
~180.000 km of pipelines

Recent extension



Recent extension

Republic of Serbia



SAInt: Electricity – Gas interactions

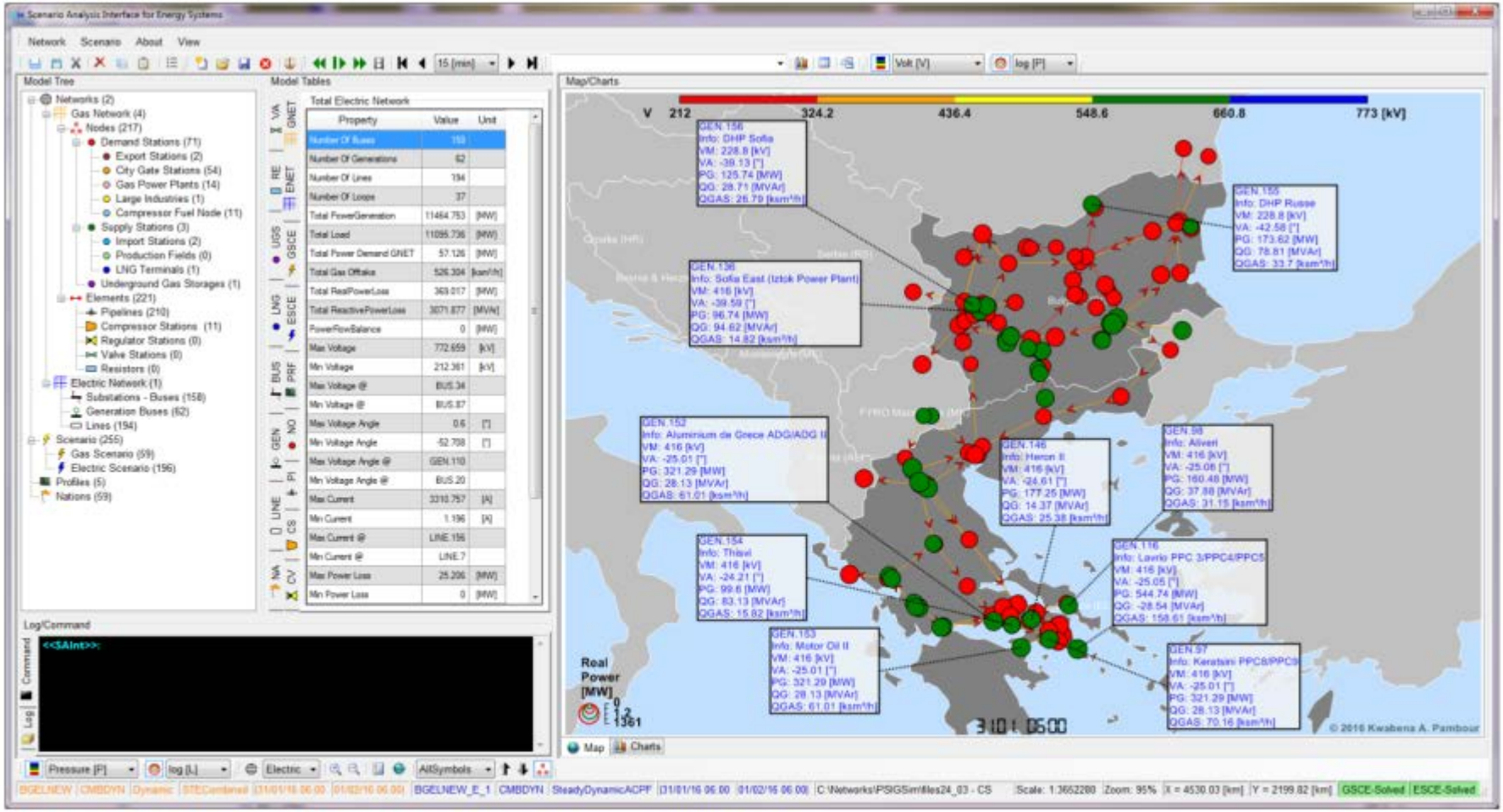


Figure 8: Model of the Bulgarian-Greek power transmission system plotted in the graphical user interface of developed software. Map shows results of a steady state computation for the coupled system. Diameter of the circles representing load (red) and generation (green) buses correspond to the magnitude of active power in logarithmic scale, as can be seen from the legend in the bottom left corner. Colors of the line elements correspond to the voltage levels indicated in the colorbar on top. Transmission line arrows indicate flow direction of electric current. Labels describe a selected number of generation buses (green circles) connected to gas fired power plants.

Data needs:

- Infrastructure standard
  - Technical firm capacity
  - Dmax and Deff
- Supply Standards
  - Protected Customers definition
  - 7-day, 30-day peak demand and 30-day average demand

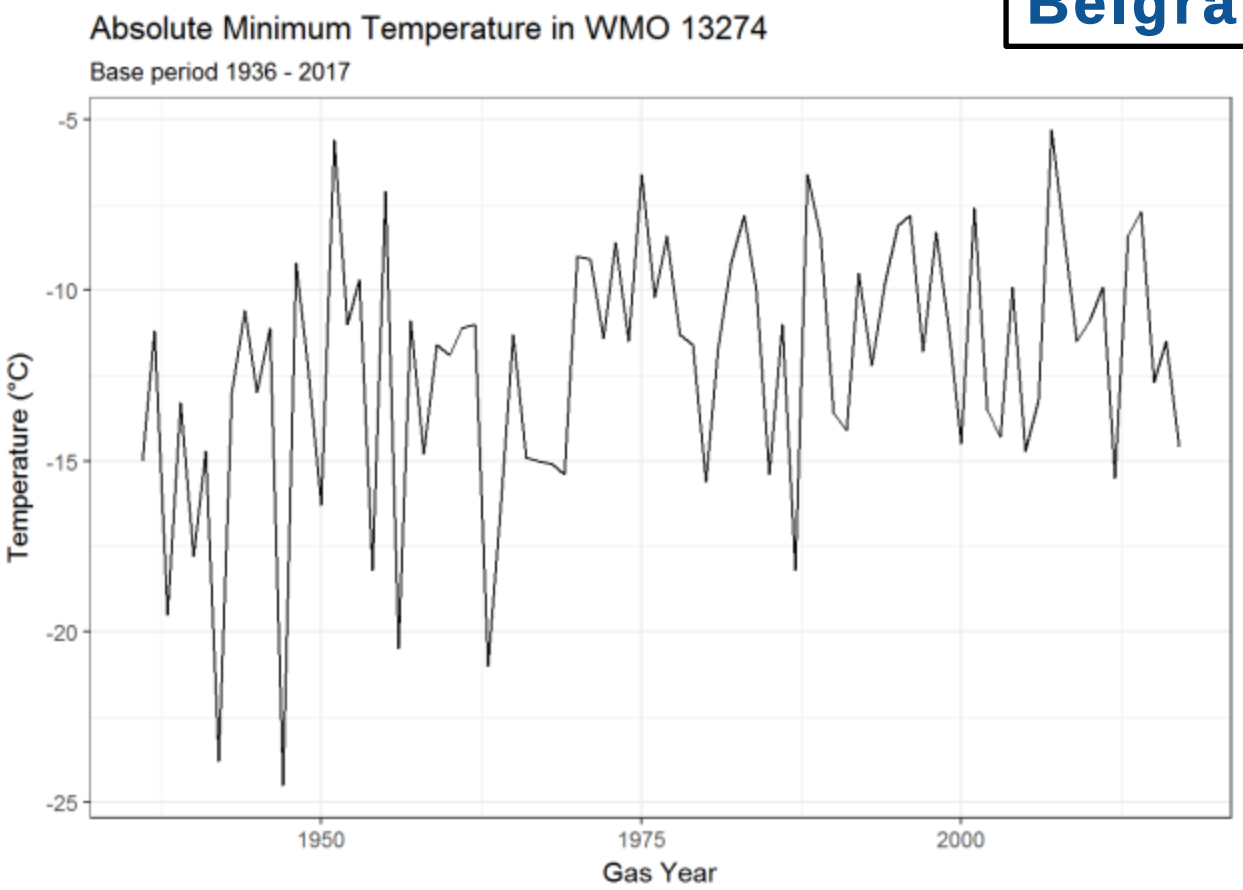
1-in-20 return time

Data needs:

- Dmax, Supply Standards need
  - Time series of demand by user category (2-10 years)
  - Meteorological data:
    - Minimum and average temperature for the day or hour
    - Representative stations (i.e., main center of consumption)
    - Time horizon: minimum 50 years

Data needs:

Belgrade Observatory



1-in-20 estimated minim temperature:

-19.6 ° C

Data needs:

- Hydraulic model
  - Network structure (i.e., map with diameters and in-/off-take points);
  - Main regulators/valves;
  - UGS (withdrawal-inventory relationship, injection pressure);
  - Compressor station details (suction pressure, discharge pressure, compressor ratio, installed power) and pipeline layout;
  - Contractual constraints (minimum deliverability pressure);
  - Demand profiles for off-take points.

Conclusions

- Next training is planned for November 6 – 7 2017 in Belgrade;
- Shortly the invitations will be send out;

- Funds for collaboration with Contracting Parties have been granted;
- We plan to start activities November 8 2017;
- A first working hydraulic model for the Republic of Serbia is ready;
- Legal steps – if needed – could start.

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