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Human Capability Building for Polish Nuclear Power Program

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General context (1)
Poland is surrounded by NPPs up to 300 km from state borders

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- 23 reactors operating
- 6 reactors under construction
- 9 reactors planned up to 2025

In 2020 Poland will be entirely surrounded by NPPs.

From 2024 the only neighbour country with no NPP will be Germany. However, Germany will be importing significant amount of nuclear electricity from France, Sweden, Czech Republic, Switzerland and Poland.

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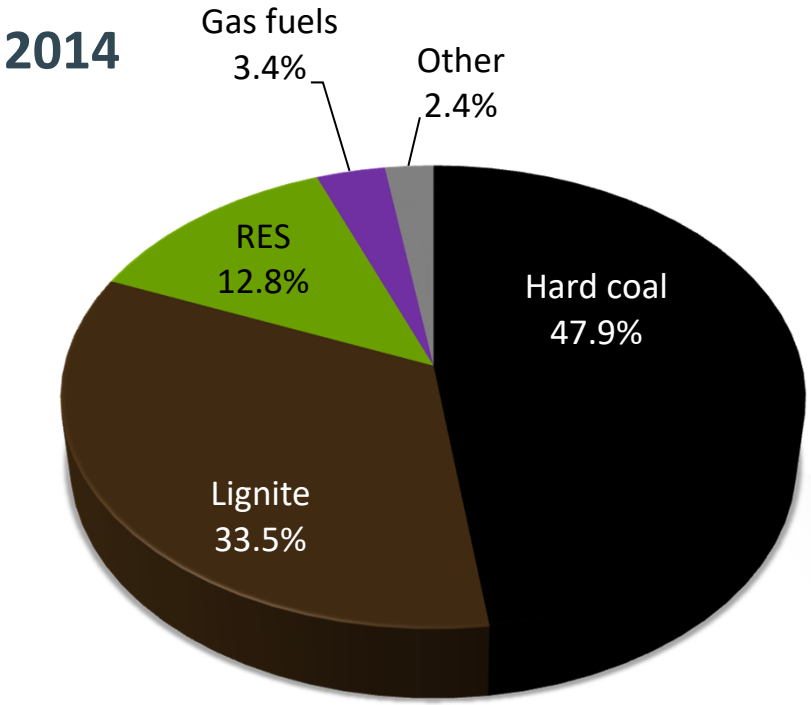
General contex (2)
Electricity generation structure (*energy mix*)



Sources: Update of forecast of fuels and energy demand, EMA, June 2013 / Statystyka elektroenergetyki polskiej 2015 (Statistics of Polish power sector 2015), EMA, Warsaw 2014

General context (3)
Age Structure of the Existing Power Plants in Poland

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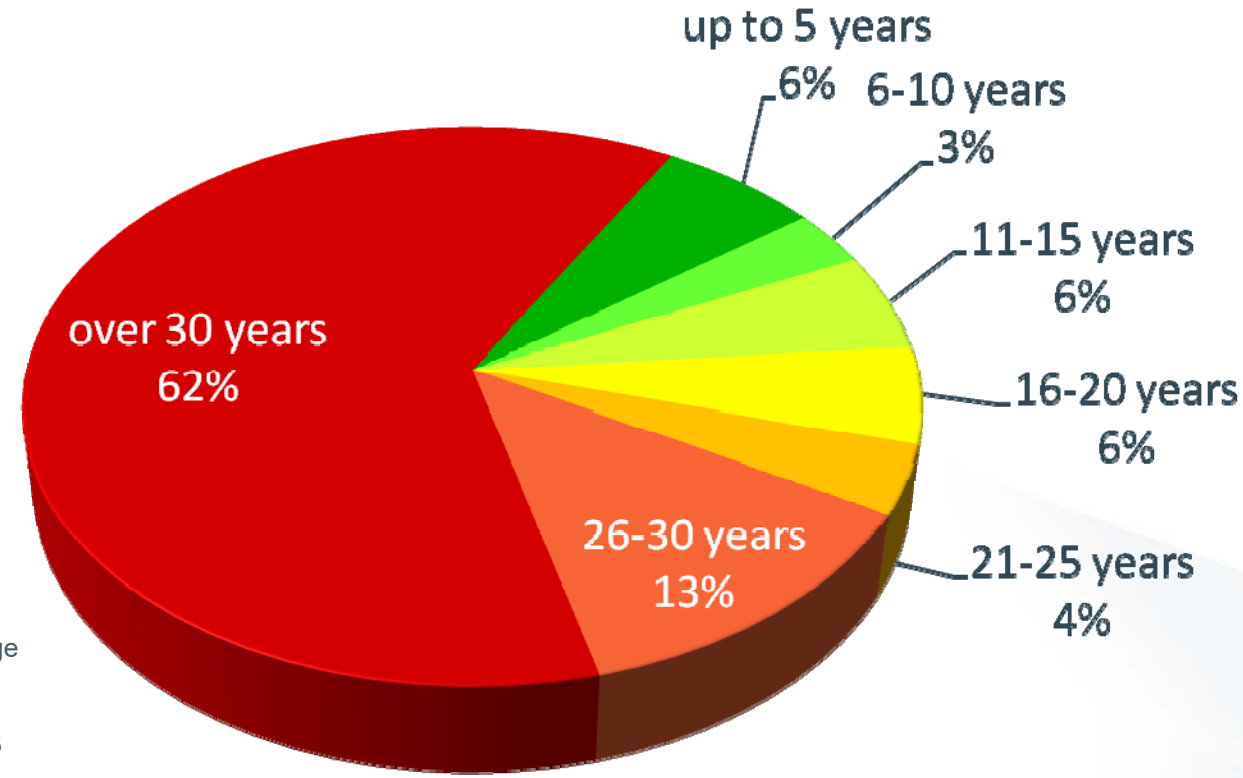

Sorted by boiler`s age

Data: Polish Energy Market Agency 2013

Out of 33.5 GWe of current capacity ca. 6 GWe will be written off before 2020 and further 6 GWe will be shutdown before 2030. This is 36% of present capacity. Nuclear power plants can replace it to some extent.

General context (4)
Power demand is growing systematically

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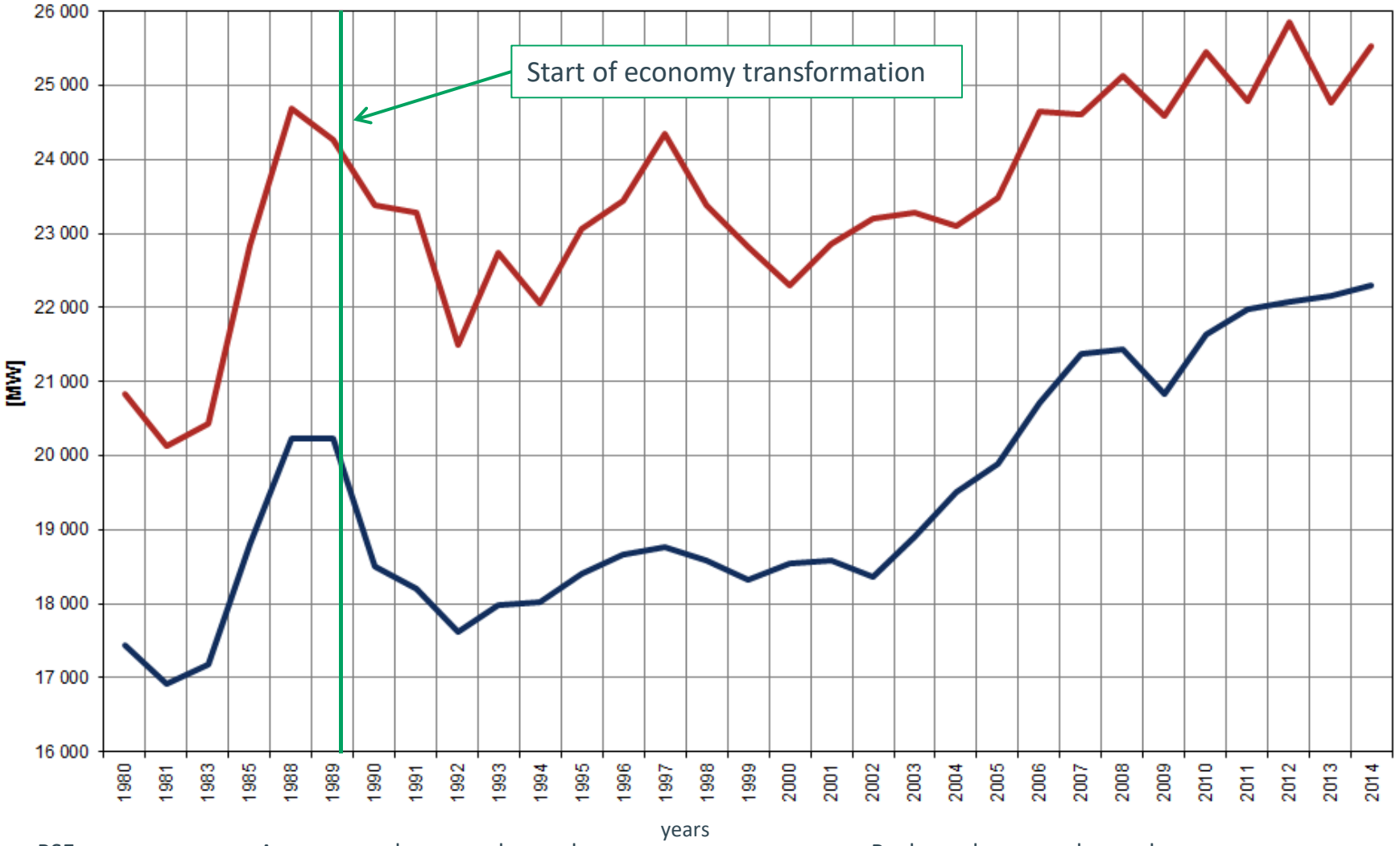

source: PSE

General context (5)
Legal basis

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- Poland's "Energy Policy until 2030" - implementation of nuclear power could couse diversification of power generation sources
- Resolution no. 4/2009 of the Council of the Ministers of 13 January 2009 on nuclear power development activities.
- 2009 – establishing the Government Commisioner for Nuclear Power and Nuclear Energy Department at MoE
- Amended Atomic Law
- Act on the preparation and implementation of investments in nuclear power facilities and investments for the supporting infrastructure (called "investment law").
- 28.01.2014 - The Polish Nuclear Power Programme (PNPP) – Chapter 11 HRD

Polish Nuclear Power Program

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- Rationale to introduce nuclear power in Poland:

  1. assuring long-term security of electricity supply
  2. maintaining electricity prices at levels acceptable by the national economy and the society
  3. reducing emissions of SO_2, NO_X, PM and CO_2

- 2 NPP planned with total installed capacity: 6000 MWe

Polish Nuclear Power Program – current status

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October 14th 2016 Council of Ministers approved a Report of Minister of Energy on implementation of Polish Nuclear Power Programme 2014-2015 and ordered:

- to update of schedule and business model of the Program by t he end of the first quarter 2017,
- to establish a Committee for the Nuclear Power Development coordinating implementation of the

  Programme,
- to update of whole the Programme by the end of 2017.

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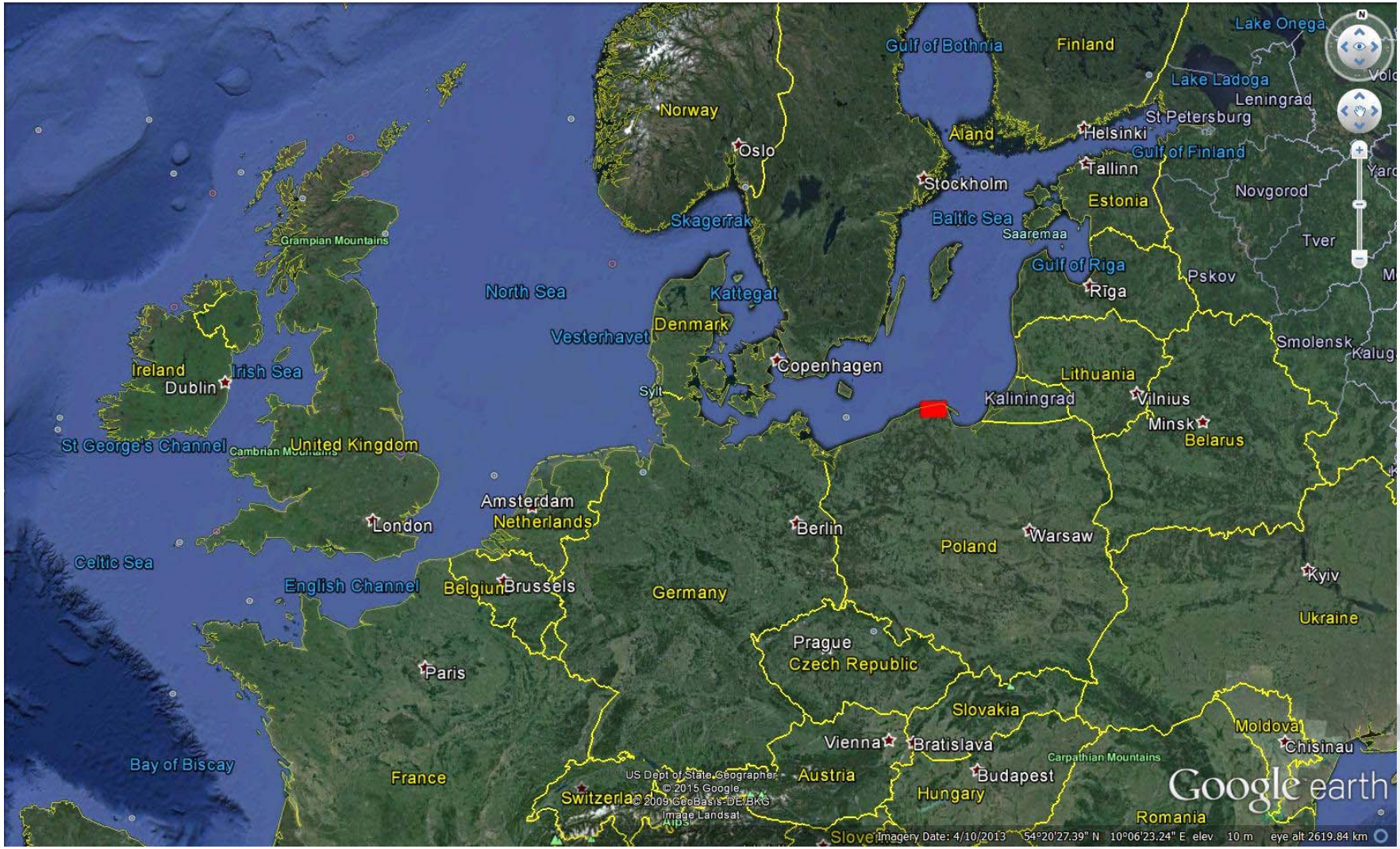
Possible NPP sites



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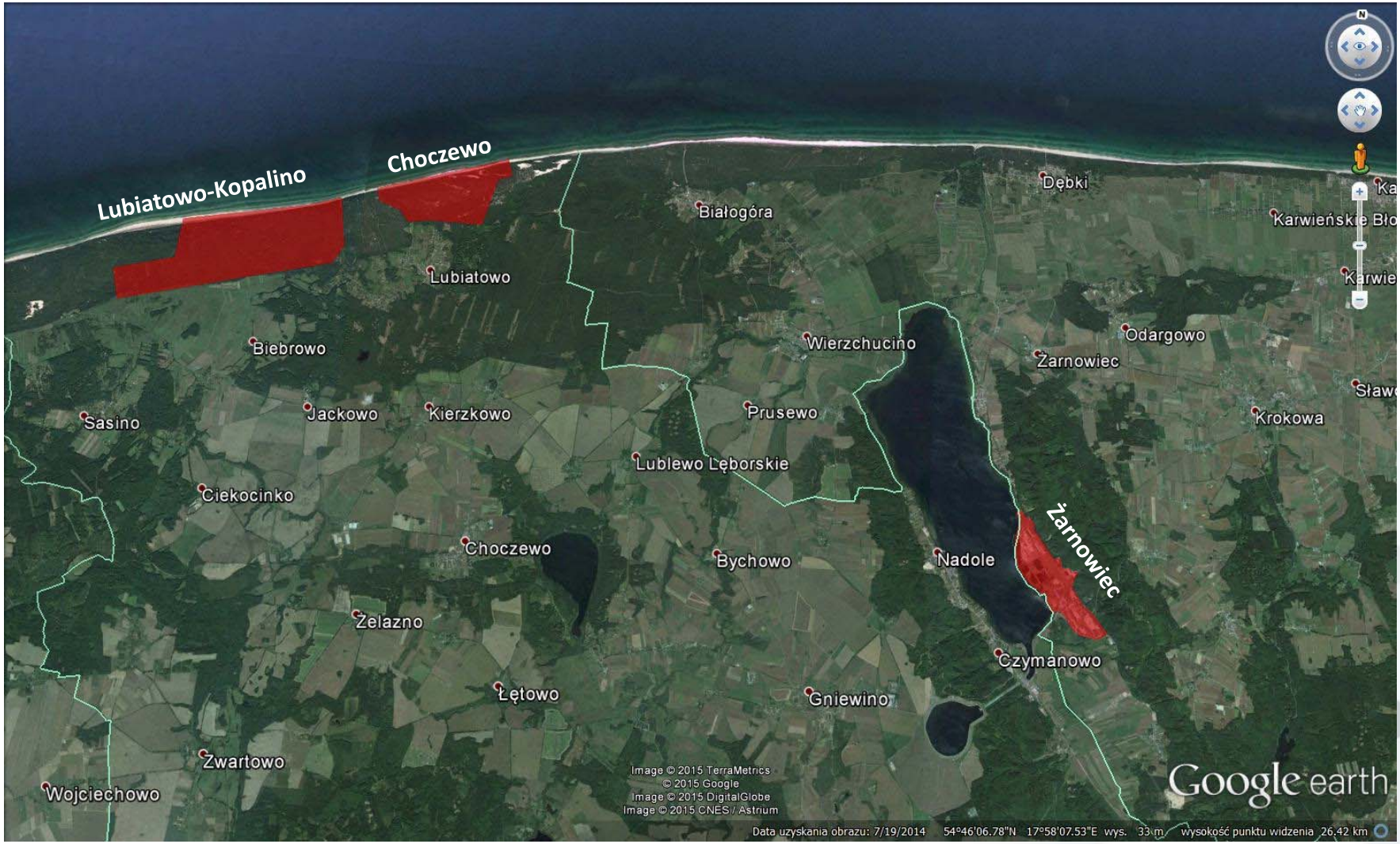
Possible NPP sites



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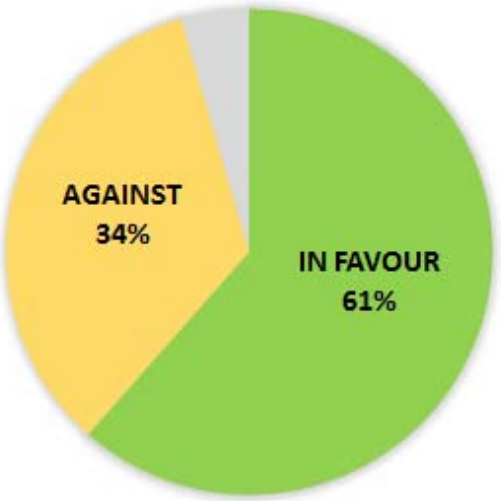
Public opinion poll - November 2016

- **61%** of Poles are in favor of building a nuclear power plant in Poland
- **The highest score** in history of the survey, which is conducted annually since 2012
- **48%** of respondents would agree to have a nuclear power plant built near their homes
- **73%** consider construction of a nuclear power plant as an important issue for Poland's energy security



Nationwide, representative sample of 2 000 respondents

Roles and responsibilities PNPP – Who does what?

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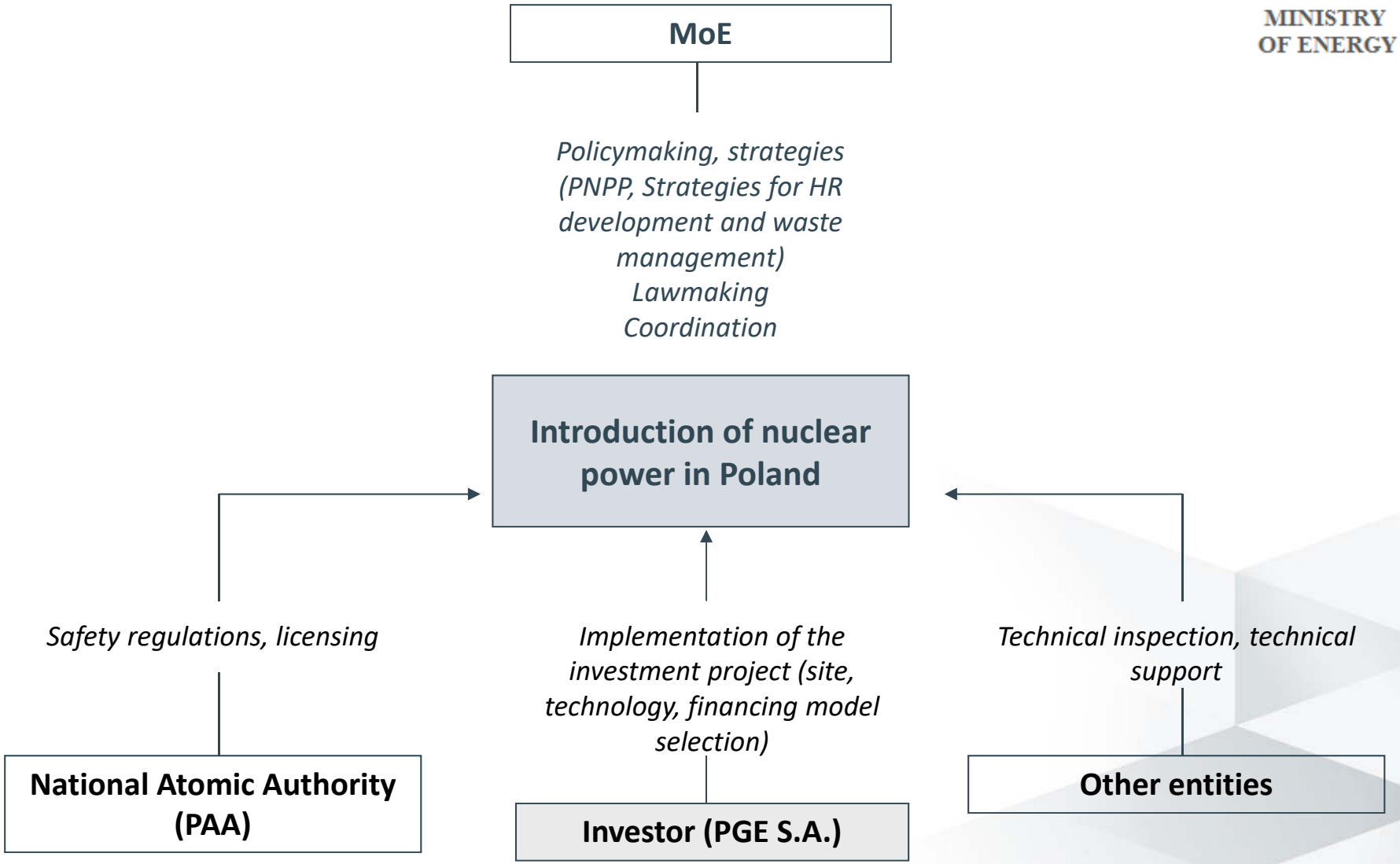

General Context of HRD in area of Nuclear Energy

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1. After the change of political system in Poland (1989/90) the government resigned from the project of construction of the first polish NPP in **Żarnowiec**. It resulted, inter alia, in the migration of the majority of Polish experts in the field of nuclear energy, who left Poland to work abroad at universities, research centres and NPPs

2. There is 1 **research reactor** (MARIA) in Poland located in National Centre for Nuclear Research in Świerk (NCBJ)

3. Now Poland has **5 main research centres** running R&D in the field of Nuclear (National Centre for Nuclear Research in Świerk, Institute of Nuclear Chemistry and Technology, Institute of Plasma Physics and Laser Microfusion, Central Laboratory for Radiological Protection)

4. There are some **universities** and technical universities running studies - nuclear engeneering, nuclear chemistry, nuclear security and radiological protection, nuclear technology and physics etc.

SWOT analysis in area of HRD

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Strengths: higher education system, well developed scientific community, Research Reactor, Polish workforce engaged in nuclear projects abroad

Weaknesses: small investor's employment, small interest in studying nuclear subjects, weak vocational education system, weak effectiveness of industry – science cooperation

Opportunities: new, attractive jobs, development of modern industry sectors, raising the level of work organization, education of specialists and lecturers in Poland, use of potential of Polish enterprises

Threats: weak institutional cooperation, lack of stakeholders' engagement, lack of funds, lack of students' interest in the subject

Main challenges in area of HRD

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1. **Lack of final decisions on implementing PNPP** – timetable, range, technology, model of cooperaration with vendor (type of contract)
2. **Lenghtening of the proces of site selection by investor** – it affects problems with timetable of PNPP.
3. **Building of our own, Polish human capabilities** – more difficult than simple hiring resources abroad.
4. **Management of expectations of some stakeholders** – spending money for education programmes and for research institutions - just now!
5. **Existing instiutional potential and human resources not suitable to implementing new nuclear programme –** but changing step by step.
6. **Coordination system –** plenty of stakeholders, whose activities it is needed to coordinate.
7. **Poland as Knowledgable Costomer in area of HRD**

Some dillemas in area of HRD

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1. **How the system of education of technical staff should look like?** Should we open special technical schools or should we ad some nuclear issues to curricula of existing schools?
2. **How to conduct training system for engineers?** Education gained in selected specialized in nuclear power campuses or more scattered, organized according to individual plans and the concept of the universities?
3. **What should be the role of research reactor MARIA in NCNR (Swierk) in education and training?**
4. **What role should play Vendor/Vendor Country in HRD?**
5. **When the recruitment to schools/universities should be taken?**
6. **What is the optimal model of professional training for emergency medical services, fire, inspection, security, border, customs, etc.?**

HRD Framework Plan for the needs of Nuclear Power in Poland – main assumptions

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Role of the HRD Framework Plan

- preparation datas and information to implement of the *National Plan for Human Resources Development for the Needs of the Nuclear Power in Poland*

Execution time:

- the period from the adoption of the Framework Plan by the Management of the Ministry of Energy to the conclusion of the tender to choose technology and strategic partner.

Main objective:

- **creation of the adequate and competent Staff by all stakeholders**.

  The creation of the effective cooperation model by main stakeholders in order to utilize the synergy of mutual activities to prepare the necessary HR maximally based on the national potential – is expected.

HRD Framework Plan – specific objectives

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1. **Coordination of activities of Main Stakeholders (establishing of mechanism of coordination, exchanging information, common work on further actions)**
2. Preparing new self-assessment of Capacity Building
3. Gathering upgrade knowledge on state of preparedness of HR (annual reports)
4. Upgrade of needs of Main Stakeholders
5. Comparison national needs with current status and definition of further actions
6. Gathering information on international possibilities in area of education
7. Support for nuclear R&D sector

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- **Cooperation with Main stakeholders (informal network)**
- **Publishing of educational materials:** brochures, educational movie, computer game*, books, t*raining materials for teachers of secondary schools
- **Organisation of events, meetings, semminars, conferences, trainings**
- **Training courses for Polish professors – in cooperation with CEA/AFNI**
- **Running of identification of national resources and needs (reports)**
- **Analisys on influence of PNPP on labour market (report)**
- **Preparing HRD strategies (draft of HRD Plan and Framework Plan of HRD)**
- **SV on HCB (TC IAEA) to France (March 2016) – MoE, PAA, PGE EJ1**
- **National Workshop on Becoming Knowledgable Customer in area of HRD (2017)**

NATIONAL ATOMIC AUTHORITY (PAA)

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On-going process of reorganization and enlargement of PAA in order to meet the growing tasks of regulation (as a result of plans to introduce the PNPP).

- Comprehensive Training Programme, including individual development plans
- SARCoN - Systematic Assessment of Regulatory Competence Needs Metodology adopted and implemented to the needs of PAA
- Systematic Approach to Training adopted in PAA:
  - Training courses and workshops,
  - On the Job Trainings,
  - Fellowship –training programmes,
  - Post-graduated studies,
  - Study visits.

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PGE EJ1

Delivered

- 2015 – prepared Capacity Building Plan with Technical Advisor (Owners' Engineer)

Ongoing

- Staffing Plan for pre-development stage including Organizational Roadmap, Recruitment Plan, Job Descriptions and Labor Market Analysis (for technical area)
- Development of nuclear competencies through training courses and study visits, organized by foreign parties, incl. IAEA

Near Term Plan

- 2017 – Preparation of Systematic Approach to Training (SAT) methodology
- 2017 – Staffing Plan for the Development & Construction Stages

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Thank you for your attention!

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