



Brussels, 25.03.2010

**Polish Science for the 7th Framework Programme  
“Sustainable Energy and Efficient Use of Energy Resources”**

# **Nuclear power as a sustainable energy source for Poland**

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# *Sustainable development*



**Development is sustainable if „meets the needs of the present without compromising the ability of future generations to meet their own needs.“**

**It is not enough to leave the environment untouched!**

# *Sustainable development*



- It is our duty to provide next generations with the means to leave decent lives,
- including the means of producing enough energy without environment degradation



## *Nuclear energy is sustainable*

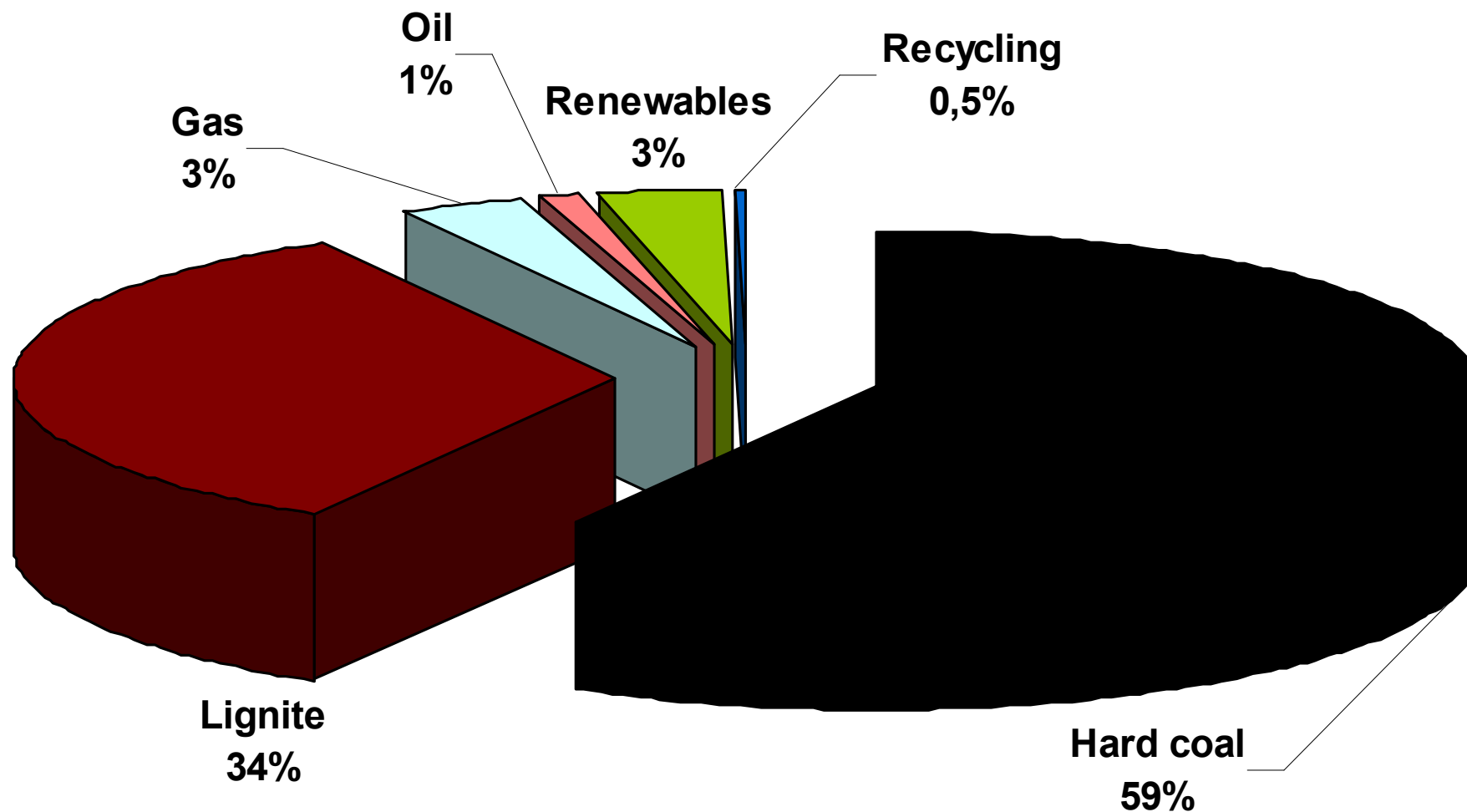
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- **Can provide large amount of energy**
  - 76% of France, ~22% of OECD
- **No impact on environment**
  - One site <10ha gives ~3-5 GW  $\approx$  10% of Poland needs
- **Practically unlimited fuel resources**
  - 100-300 years with business as usual
  - 1000 years with reprocessing, more with U from sea, Thorium,...
- **No pollutions, very small waste**
  - no SO<sub>2</sub>, NO<sub>x</sub>, dust etc; <1kg of waste per human live
- **Lowest cost**
  - significantly lower with CO<sub>2</sub> limits
- **Matured and safe technology**
  - ~10 000 reactor-years of experience



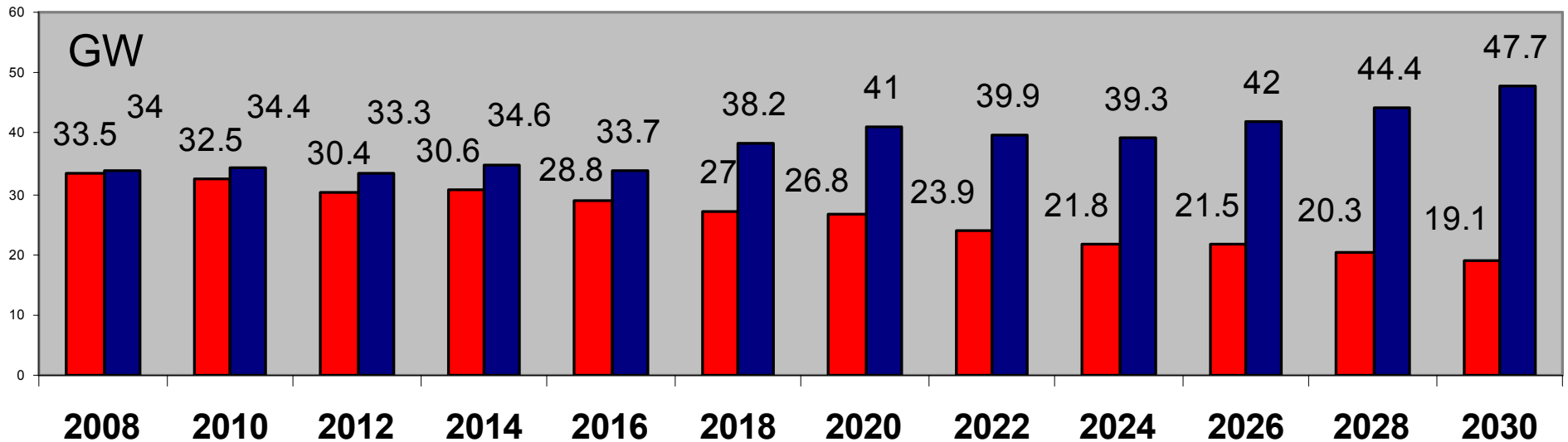
## Electric energy mix for Poland 2006

Poland is the only country in EU with ~100% own sources





# Need for new power sources in Poland



■ Power installed (inc. decommissioning) ■ Power planned

- In 2010 we have **32.5 GW**
- By 2030 we need to build new **28.6 GW**
  - ⇒ **All sources have to be exploited to the max**
  - ⇒ **No room for competition**



## *Polish Nuclear Power Program*

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- **13.01.2009** – decision to initiate preparation of the program
- **12.05.2009** – Hanna Trojanowska appointed as Governmental Plenipotentiary for Polish Nuclear Power
- **11.08.2009** – decision on the program agenda
  - Action 8: developing R+D support for nuclear power industry - forming National Laboratory for Nuclear Research based on existing institutes
- **10.11.2009** – release of strategic documents:
  - Energy Policy of Poland till 2030
  - Implementation program for 2009-2012
- **16.03.2010** – ranking of sites published



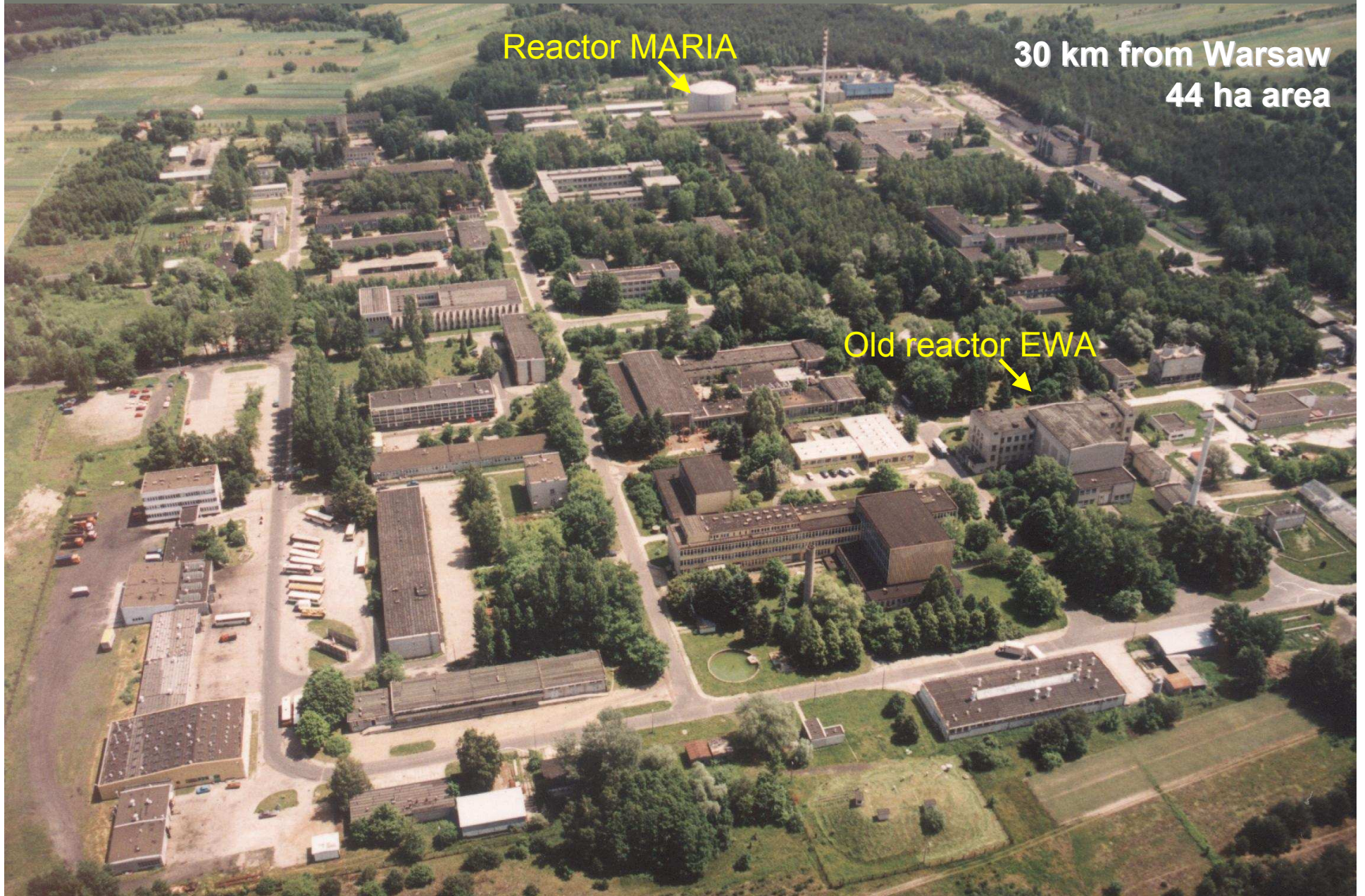
## *Polish Nuclear Power Program*

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- **PGE appointed as the first investor**
- **National Center for Nuclear Research will be created to be Technical Support Organisation**
- **2009-2010: program preparation, legislation**
- **2011-2013: site decision, contract with vendor**
- **2014-2015: technical design, licensing**
- **2016-2020: construction of the first unit**
- **2030: 4800 MW nuclear (~4 units)  
≈ 10% of electricity in Poland**



# *Nuclear Center at Świerk*



Reactor MARIA

30 km from Warsaw  
44 ha area

Old reactor EWA



## Polish nuclear R&D institutes

Data for 2008	site	staff	prof.+ dr hab	dr	pa- pers
Institute of Atomic Energy (IEA) POLATOM	Świerk	458	18	44	130
Institute for Nuclear Studies (IPJ)	Świerk, Łódź, Warsaw	460	48	52	308
Inst. of Nuclear Chemistry & Technology (ICHTJ)	Warsaw	241	24	44	236
Inst. of Plasma Physics & Laser Microsynthesis	Warsaw	82	9	14	70
Central Laboratory for Radiological Protection	Warsaw	52	3	7	?
Institute of Nuclear Physics (IFJ) PAS	Cracow	486	71	115	~335
<b>TOTAL</b>		<b>1779</b>	<b>173</b>	<b>276</b>	<b>1080</b>



## *Universities with nuclear research/education*

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- **AGH Technical University in Cracow**
- **Jagiellonian University in Cracow**
- **Gdańsk University of Technology**
- **Maria Curie-Skłodowska University in Lublin**
- **Silesian University, Katowice**
- **Warsaw University of Technology**
- **University of Warsaw**
  - **Heavy Ion Laboratory (cyclotron 200 MeV)**
- **Wrocław University of Technology**
- **...**



# National Center for Nuclear Research

site	Żerań	Hoża & Łódź	Świerk	Bemowo
research infrastruct.	6 Labs   EuAcc		Maria+   Polfel	
research activities	Radiobiology & health care	<i>nuclear power program</i>	Reactor materials & thermohydr.	<b>50%</b>
	Chemistry: fuel & waste, environment		Measurements & control	
			Reactor physics & safety	
	Environment			
	Plasma		Plasma	
	Radiochem.	Nuclear physics Particle physics	<i>fundamental research</i>	<b>25%</b>
commercial activities +R&D	Material research	<i>nuclear technologies</i>	Material research	<b>25%</b> R&D only
	Industrial services		Accelerators	
			Radiopharm.	
	TechnoPark			

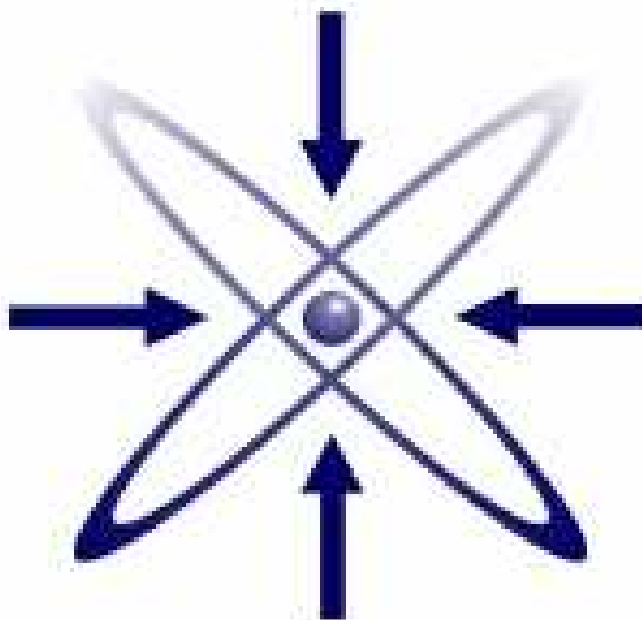


## *FP7 Euratom-Fission*

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**Branżowy Punkt Kontaktowy  
Technologii Jądrowych**