What has the Czech energy policy failed?

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Linz

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- Do we have other options?

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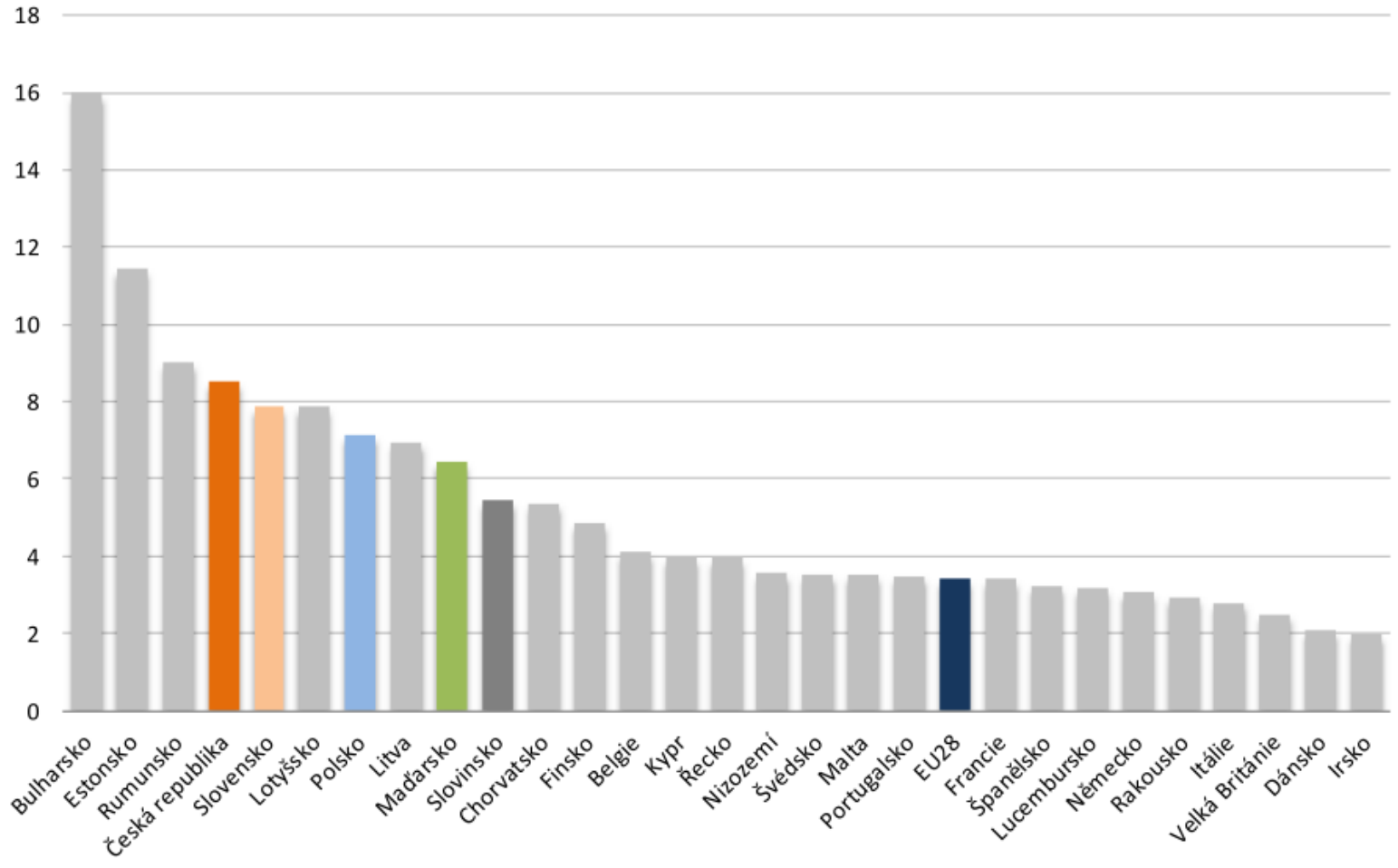
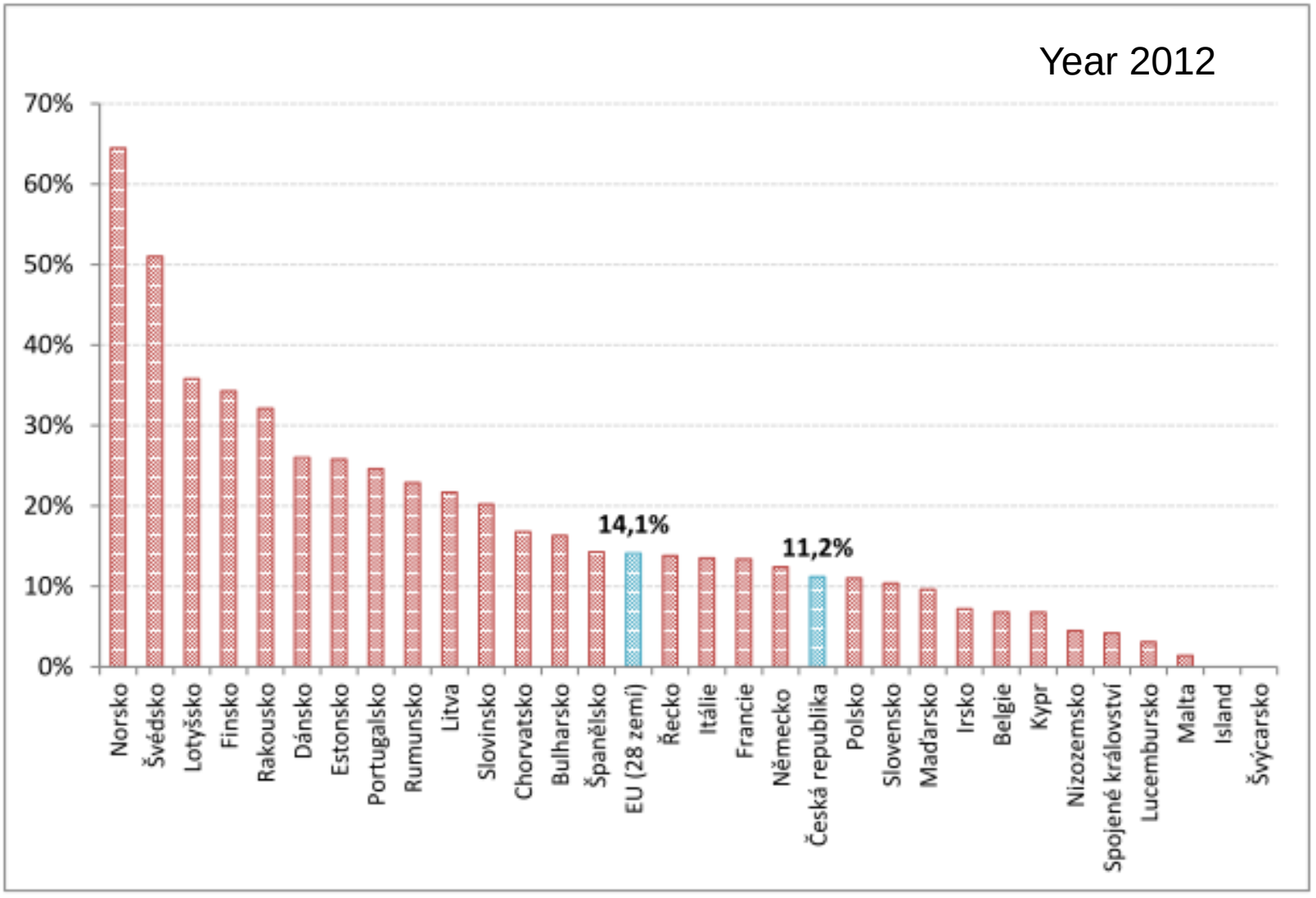
High energy intensity

The energy intensity of EU Member States (GJ/1000 eur)



Source: Eurostat

The small share of renewable energy in gross final energy consumption



Source: CZSO stats (data unavailable for Iceland and Switzerland)

Strong support for nuclear programme

The Dukovany NPP

4 x VVER 440 V-213

No full pressure containment

Instaled gross capacity: 2 040 MW

Grid date 1985-1987 – 30 years old this year, considering 50, or even 60 years in operation!

The Temelín NPP

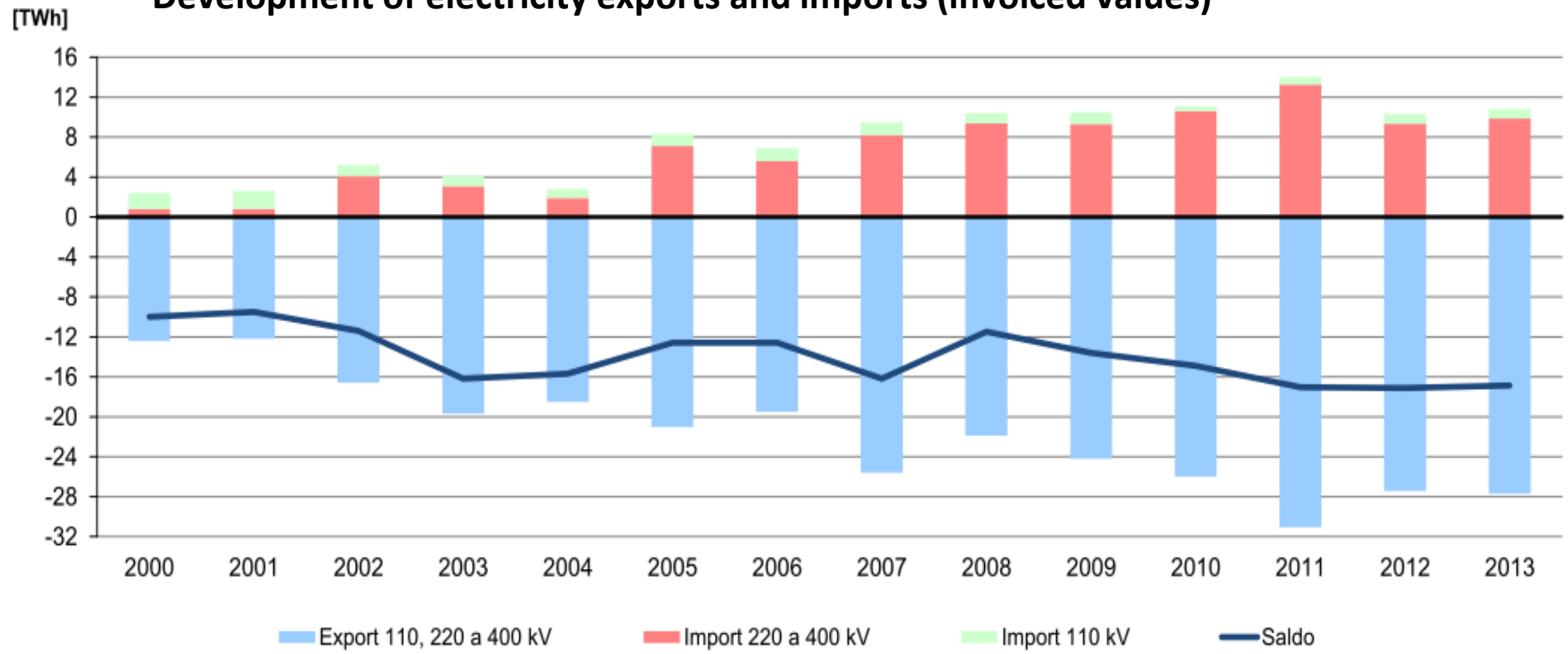
2 x VVER 1000 V-320

Instaled gross capacity: 2 100 MW

Grid date 2000-2002

High electricity exports

Development of electricity exports and imports (invoiced values)



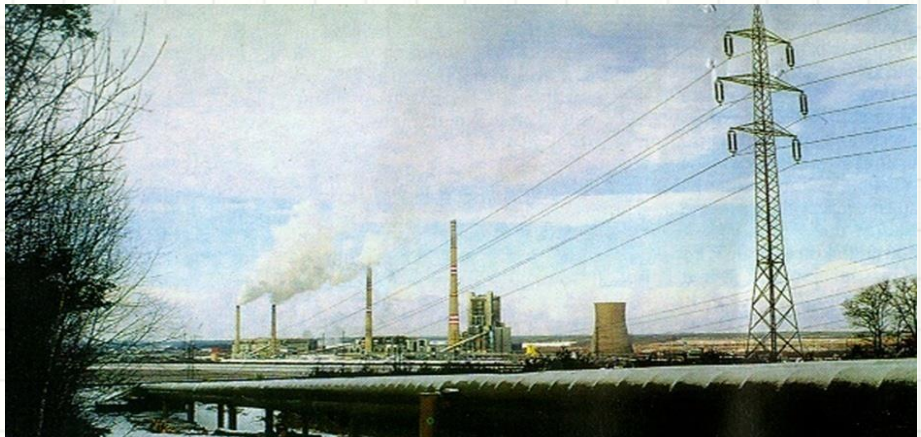
Source: Energy Regulatory Office

Positive balance of electricity in 2014: 16.3 TWh

We are one of the biggest electricity exporters in the world.

Additional problems of Czech energy

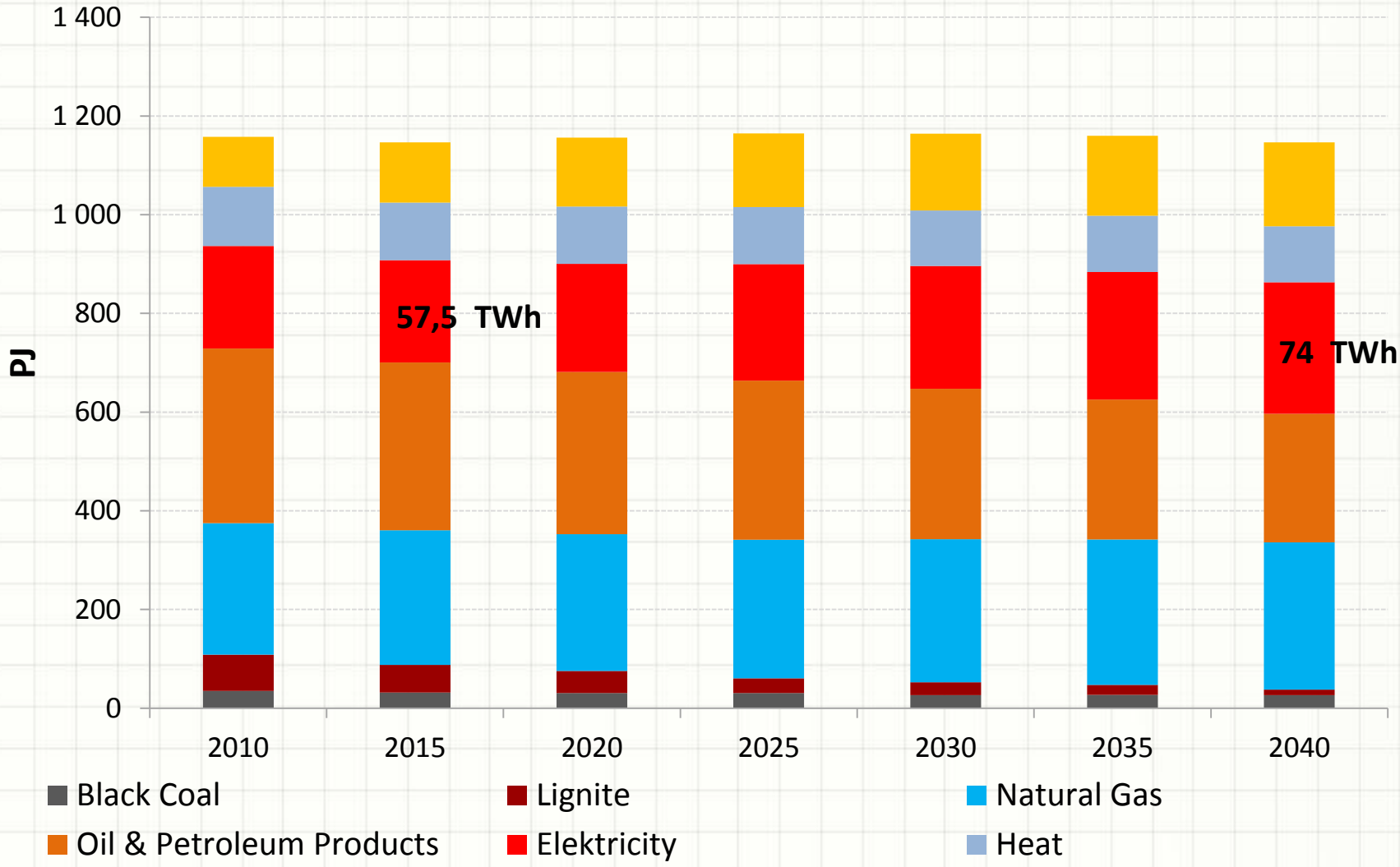
- **some of the highest greenhouse gas emissions per capita in the EU**
- **a high proportion of coal heating with the related impacts on air pollution**
- **dependence on centralized sources**
- **ČEZ's strong influence on policy and legislation**
- a lack of progressive vision - still, we look for outdated solutions that worked in the last century



The new State Energy Policy

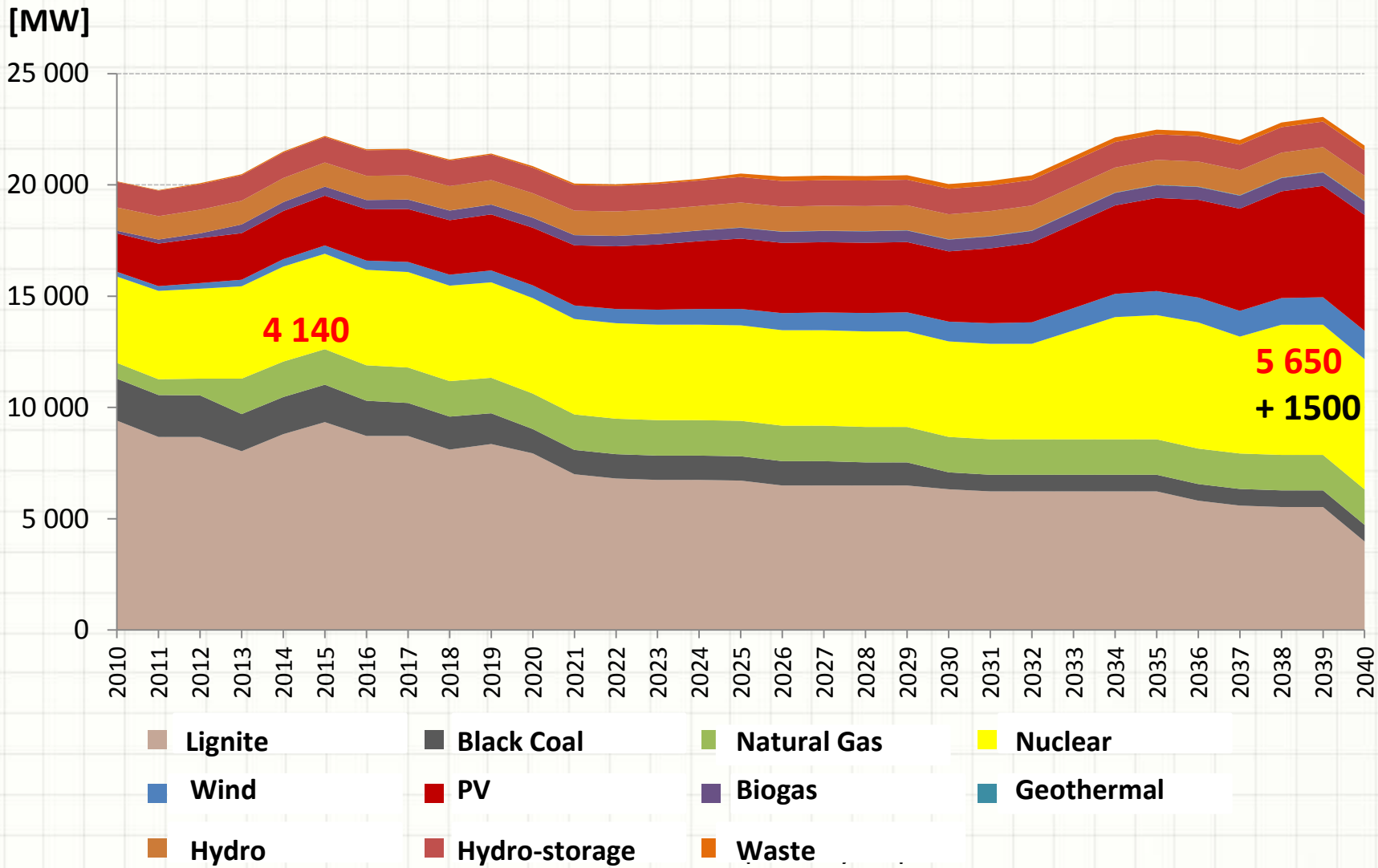
- the last Czech Energy Policy approved in 2004
- the new one was supposed to be created in 2008, but it did not happen - every Minister of Industry and Trade = his own proposal + a relatively short "lifespan" of Minister => no policy
- the current policy was created without the participation of professional associations for energy efficiency or renewable energy sources, or expert discussions => far from achieving the domestic potential
- accentuating the nuclear issues even worsens the problems

Final energy consumption 2010-2040



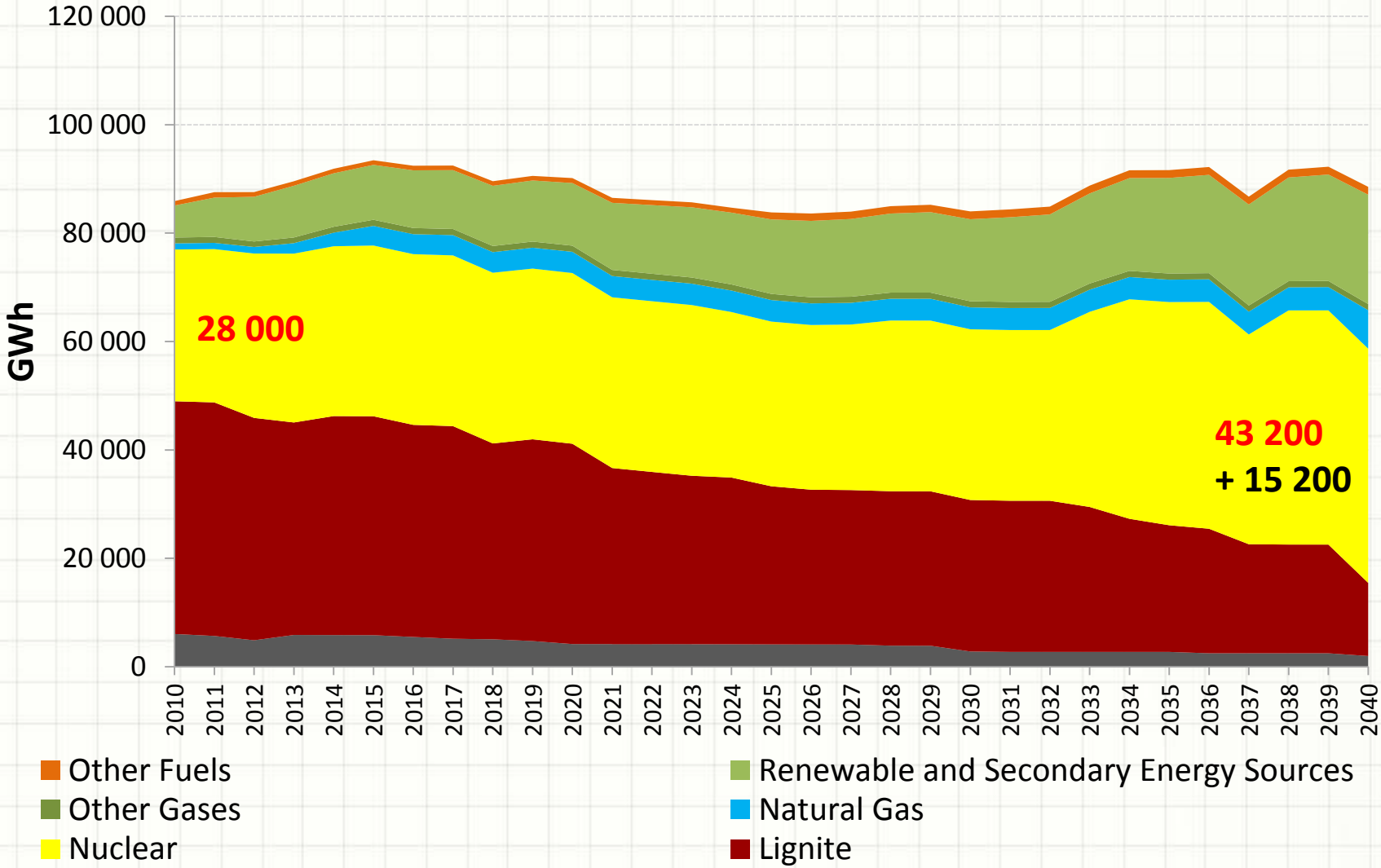
Source: Ministry of Industry and Trade

Installed capacity of power plants 2010-2040



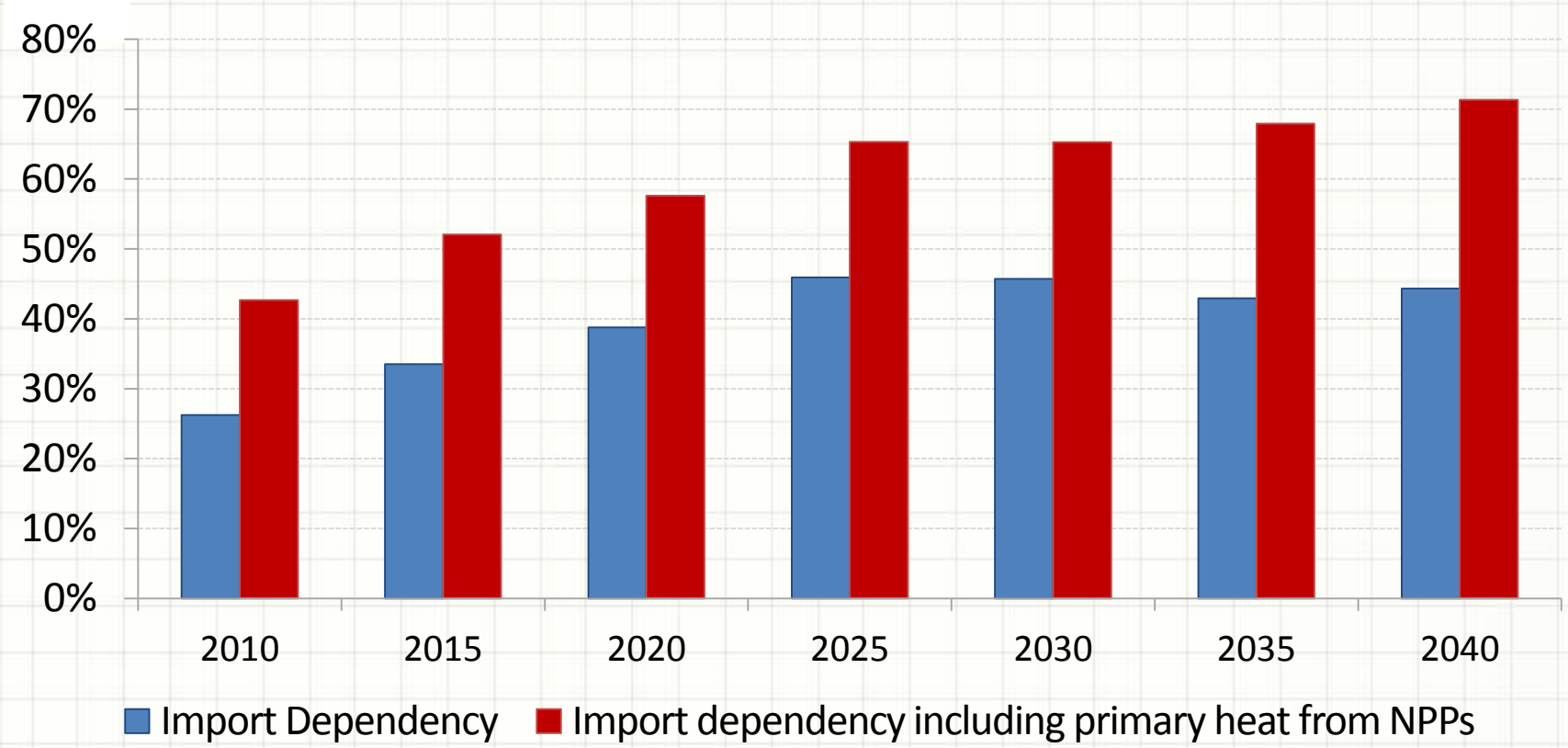
Source: Ministry of Industry and Trade

Gross electricity production 2010-2040



Source: Ministry of Industry and Trade

Import dependency 2010-2040

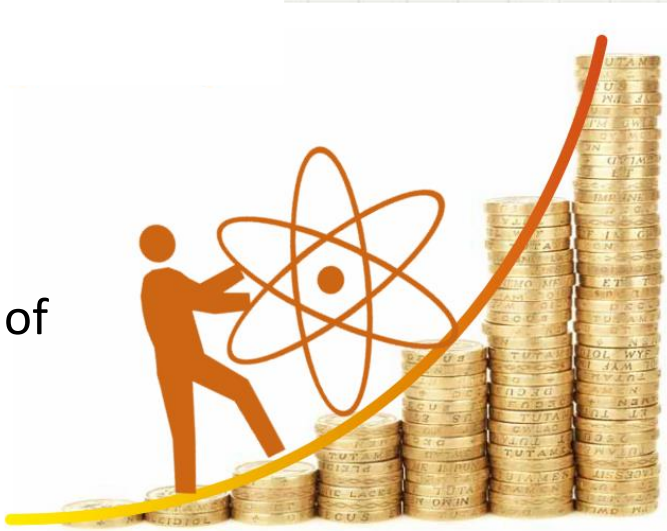


Source: Ministry of Industry and Trade

National Action Plan for the Development of Nuclear Energy

- It builds on the State Energy Policy
- Upon the government's approval, preparation for construction of one reactor at Temelín and one at Dukovany will be launched in order to start a new reactor in Dukovany before 2037
- Necessary permits for two reactors at Temelín and two at Dukovany should also be obtained, technology providers should be arranged, improved method of financing should be solved with the EU etc.

- Considered methods of construction through:
  - ČEZ, a. s., respectively, its 100% owned subsidiary
  - Private investor consortium, ie. association of investors
  - Direct construction by the state through a newly founded state company



The Project Economy?

- There should be spent up to 1,2 billion EUR just for the preparation of both projects
- The Action Plan envisages ridiculously low investment costs of 4 500 EUR/kW for construction of one block in one site
- According to Ministry of Industry and Trade, production costs of new reactors are 66-86 EUR/MWh
- Contract for Difference contemplated for 35 years

Then the consumer would have to pay for the operation 37 to 55 billion EUR!

Financing decisions should be made around 2025.

We will pay for disposal again

The International Atomic Energy Agency estimates the average cost of disposal of nuclear power plants in the amount of $ 500 million per reactor.

The State Office for Nuclear Safety determined that ČEZ must save up to 22.4 billion CZK ($ 229 million per one reactor) for future disposal of 4 reactors at Dukovany and 14.6 billion CZK ($ 300 million per one reactor) for two reactors at Temelín.

Limited liability for nuclear damage

Czech Nuclear Act limits the liability of the operator only to 292 million EUR, to be increased up to 328 million EUR.

European Environment Agency indicates a lower estimate of the scale of damage during a severe nuclear accident at 80 billion EUR.

After Fukushima, the damage is estimated at 150 billion EUR, after Chernobyl 280 billion EUR, the French Radioprotection and Nuclear Safety Institute (IRSN) has estimated the potential damage after an accident at one of the local power plants at 430 billion EUR.

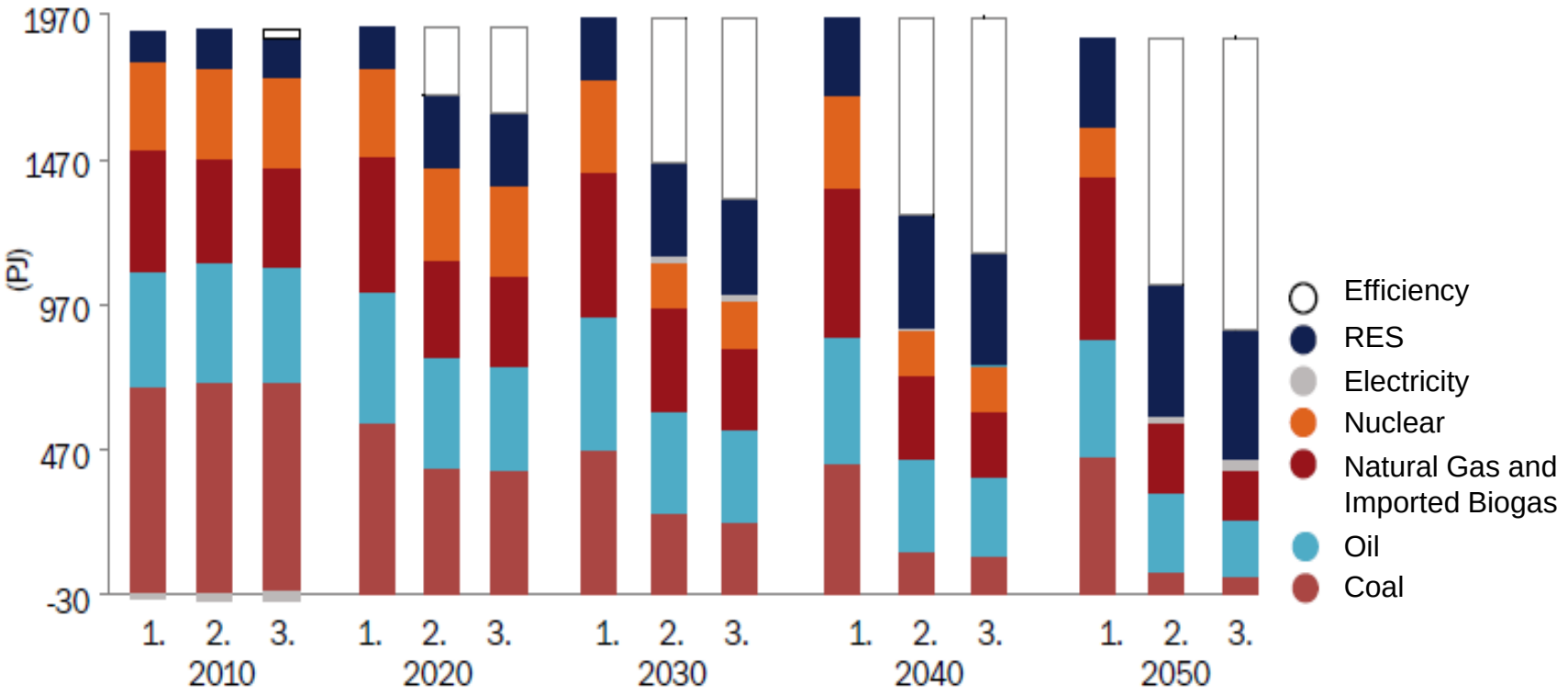
Alternatives do exist: “Smart Energy“

The calculated and concrete plan on how to transform the Czech energy. It includes:

- **opportunities for effective energy management and RES (69 % of current electricity consumption)**
- **three scenarios of the Czech economy and energy modeled by Wuppertal Institute:**
  - **“No Active Policy"**
  - **“Slow Progress"**
  - **“Innovative Approach"**
- **a set of specific recommendations and actions**

Hnutí DUHA Friends of the Earth Czech Republic GREENPEACE veronica EKOLOGICKÝ INSTITUT CALLA CDE

Three scenarios of the Czech energy - consumption of primary energy sources



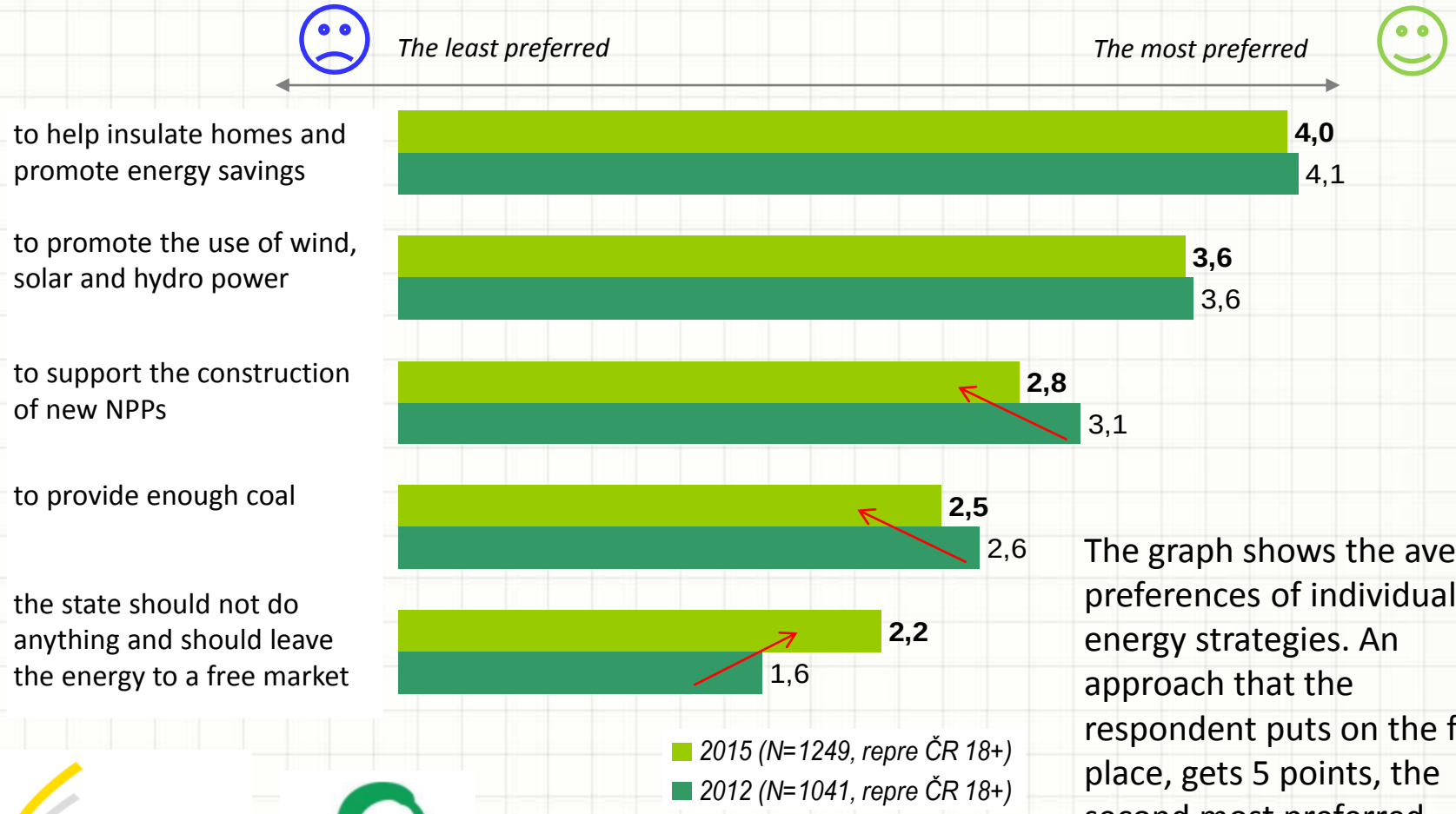
Source: Lechtenböhmer et al.

Three scenarios of the Smart Energy (Chytrá energie) vs. a draft State Energy Policy (ASEK) for 2040

	ASEK	Chytrá energie "No Active Policy"	Chytrá energie "Slow Progress"	Chytrá energie "Innovative Approach"
Final energy consumption	1146 PJ	1296 PJ	926 PJ	780 PJ
Consumption of primary energy sources (PES)	1746 PJ	1985 PJ	1300 PJ	1175 PJ
Out of it RES	300 PJ	267 PJ	380 PJ	380 PJ
Netto electricity consumption	59 TWh	66 TWh	50 TWh	48 TWh
Energy imports	71 %	80 %	62 %	58 %

What would people vote for?

"What should the state do so that in 10 years you would pay less for energy? Now I propose five possible options of what the State could do in this area. Please, sort out the individual options according to the extent to which you prefer them, ie. the most preferred option is at the first place, the least preferred option at the fifth place."



The graph shows the average preferences of individual energy strategies. An approach that the respondent puts on the first place, gets 5 points, the second most preferred strategy gets 4 points etc.

focus Marketing & Social Research

Hnutí DUHA

Thank you for your attention!

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Appendices

Uranium mining in the Czech Republic

Uranium production (tonne/U)

111,700 tons of U mined until the end of the year of 2014

Uranium mining in the Czech Republic

Mining and processing of uranium is associated with environmental pollution: slag heaps, tailing ponds, groundwater contamination, ...

Just remediation of damage after the chemical extraction of uranium in Stráž pod Ralskem cost 1,4 million EUR, redevelopment of Mydlovary, Rožná, Příbram and other deposits have cost more billions.

A new uranium mine?

In contrast with the national Raw Material Policy.
The State Energy Policy avoids the extraction of energy resources on purpose.

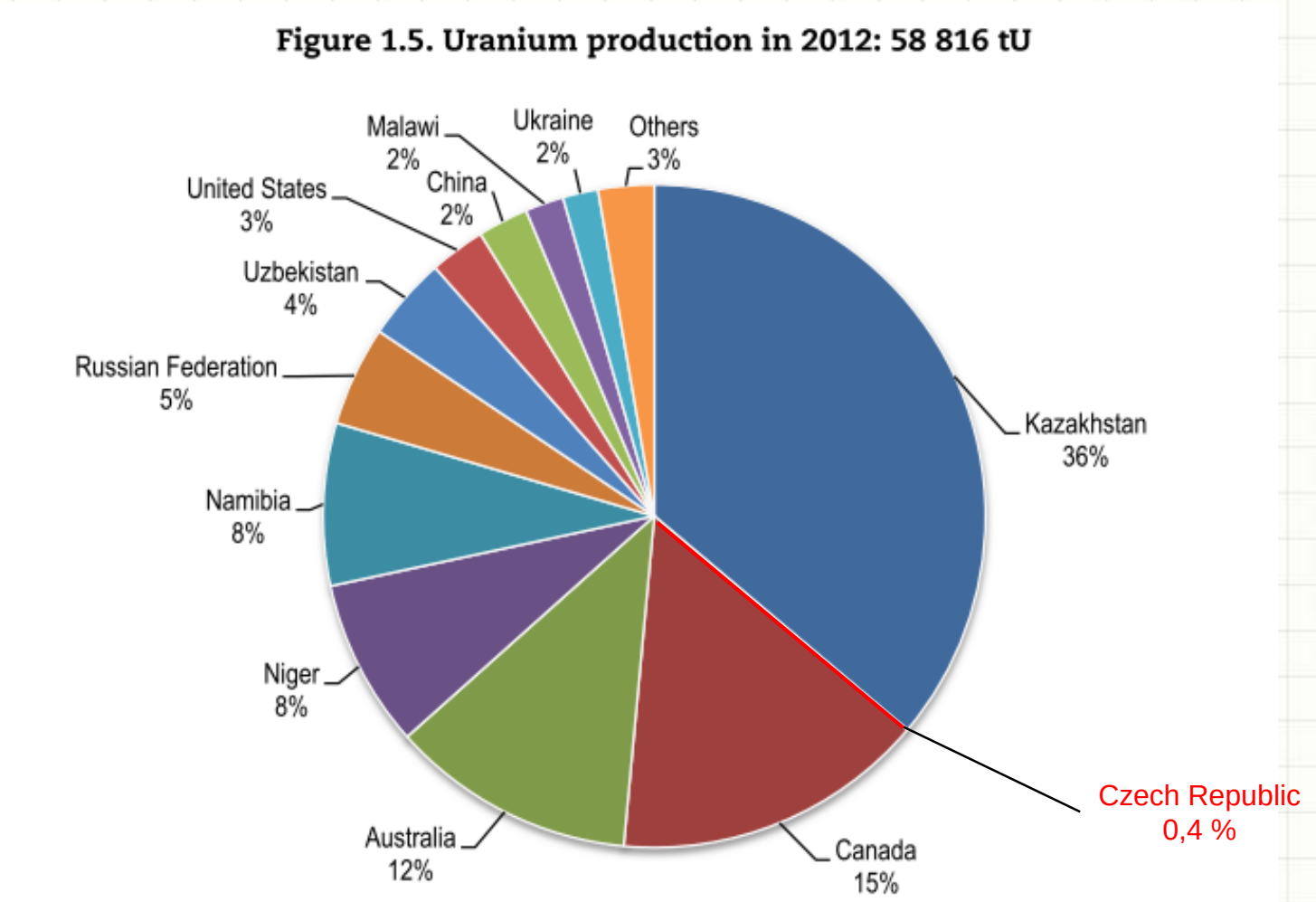
Do we need uranium from Brzkov?

The four reactors at Dukovany and two reactors at Temelín NPP consume a total of about 600 tonnes of U per year.

Mining in Brzkov should be in a volume of about 220 tonnes of U per year.

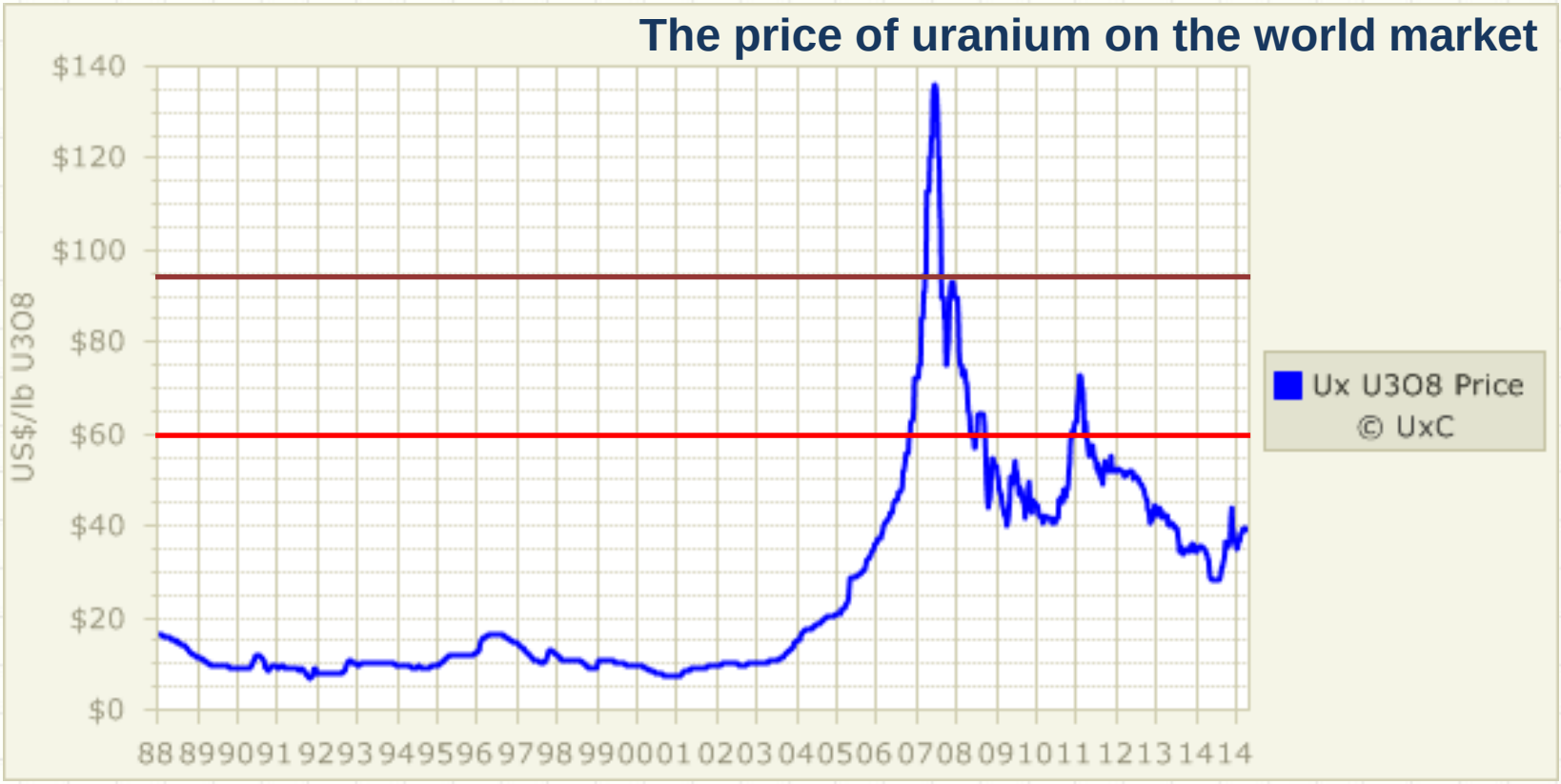
Even the optimal recoverable amount of 4,440 tonnes of U will provide only for 7 years of operation of both our NPPs.

Uranium mining in the world by country



Source: OECD & NEA

Who is going to pay for it?



Source: The Ux Consulting Company, LLC, http://www.uxc.com/

The economy of exploitation could be positive only if the price exceeds $ 60 / lb of U3O8 and only if case of higher production (of 4440 tons). If it was mined less, it would be necessary to set up a price at least at $ 90 / lb of U3O8.

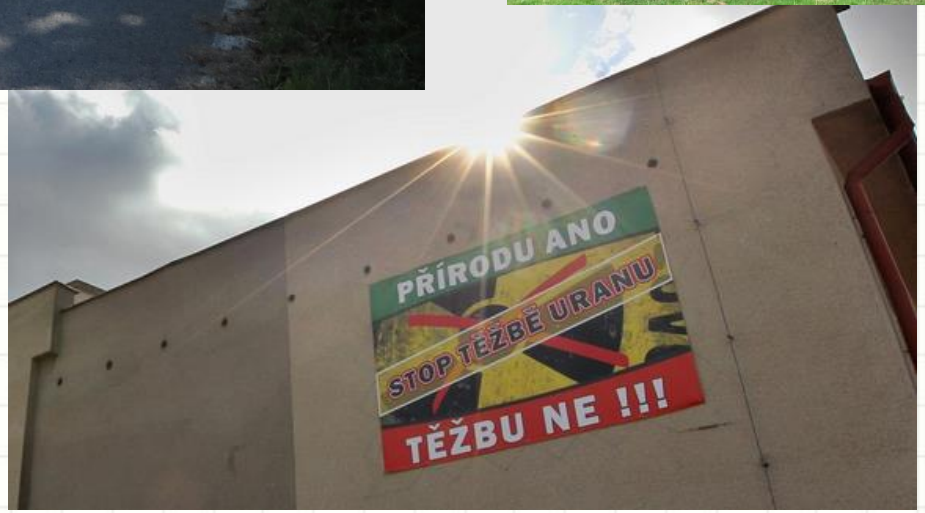
Source: ČSOB Advisory

Yet the government has launched the preparation of new uranium mining

On 22nd December 2014, the Government instructed the Minister of Industry and Trade to initiate legislation process allowing the State's access to the uranium deposits in Brzkov - Horní Věžnice.

The government will decide in January 2018 how to finance the construction of the mine and reconstruction of chemical processing plant and tailings ponds in Rožná (up to 110 million EUR). A prospective new mining will start in 2022.

Locals do not want a mining project near Brzkov



Why such a fundamental turnabout towards uranium mining?

The efforts to keep the uranium industry in the Czech Republic alive and to support the nuclear direction of the country.

To get richer reserves in northern Bohemia - up to 112,000 tonnes of U at 8 deposits. The problem - to mine the most of it can only be done by in-situ leaching, acid leaching is recommended again (this had caused a huge contamination in the past).

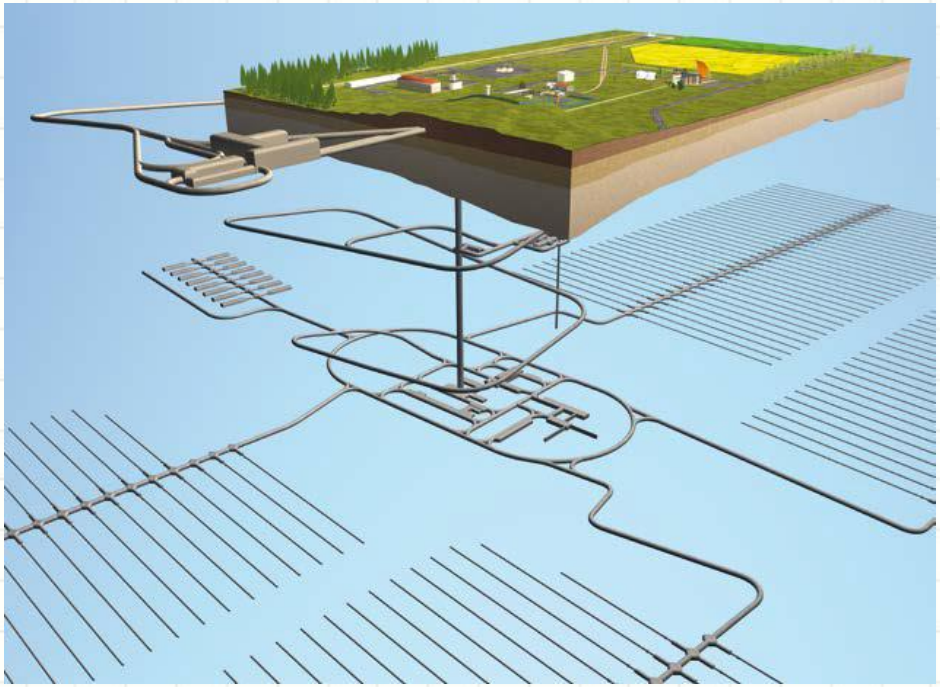
Czechia as a custom manufacturer of nuclear fuel?

2013-2014 - the UJP Praha's business plan for the location of a plant in Bystřice nad Pernštejnem to produce nuclear fuel for VVER reactors in Central and Eastern Europe was discussed. Citizens rejected it distinctly in a local referendum.

Beginning of 2014 - Efforts to locate the same plant in Světlá nad Sázavou, the company gave up the project after the first signs of disapproval.

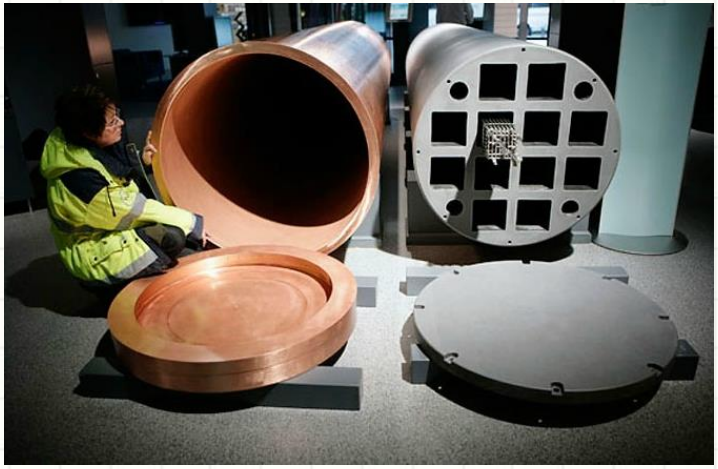
The Ministry of Industry and Trade conducted a preliminary feasibility study of locating this fuel production plant in the Czech Republic!

Nuclear waste

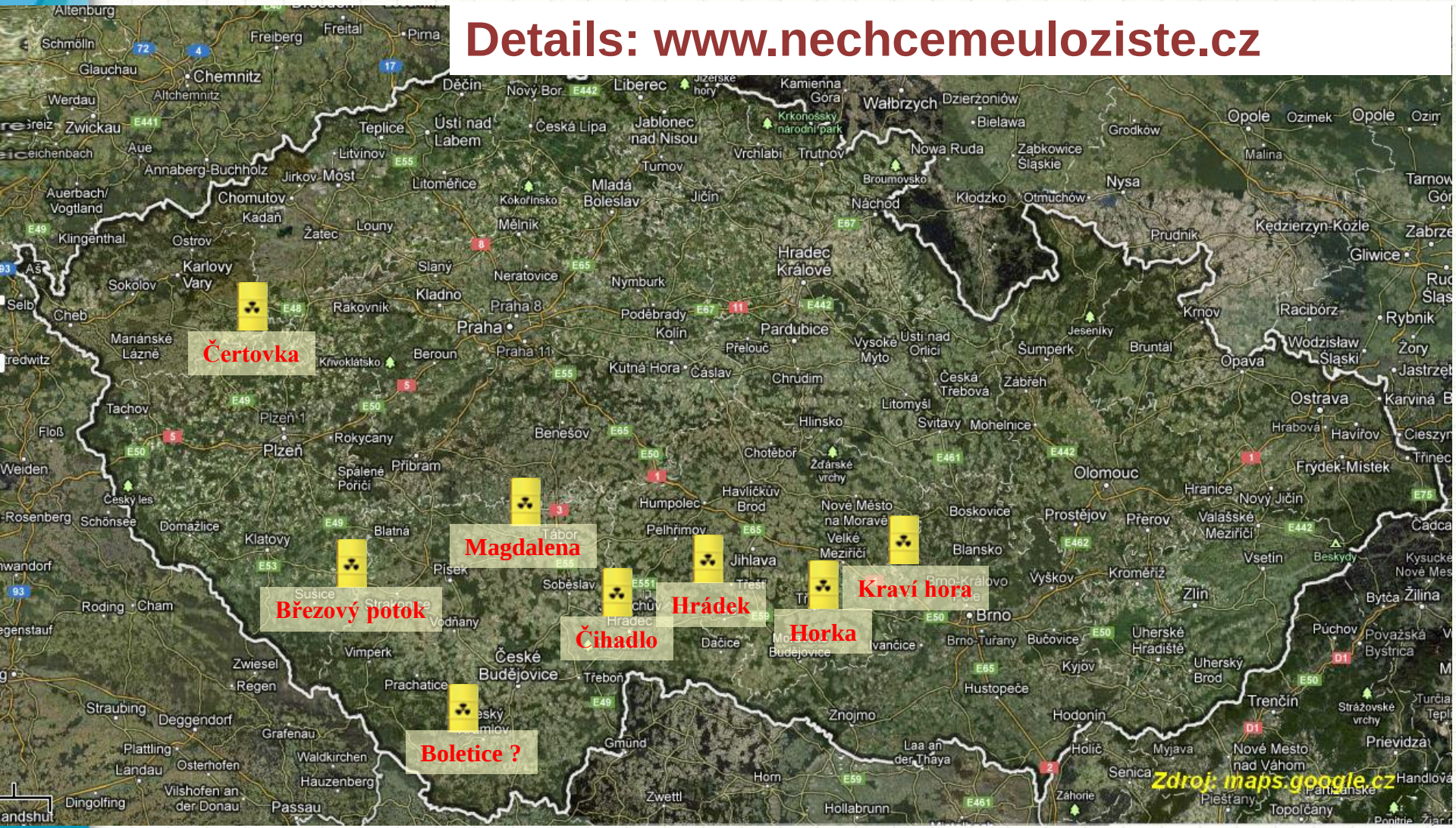


- Spent nuclear fuel: up to 10,000 tonnes, including the new reactors
- Waste from the decommissioned NPPs
- Institutional waste

Costs of construction and operation of the deep geologic repository up to 3,6 billion EUR.



7 + 1 localities for search of repository



An approved search process for DGR in the Czech Republic