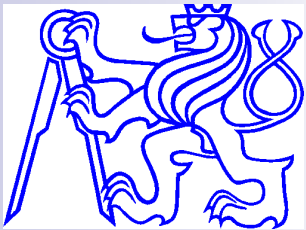


**Discussion seminar**  
**Carolinum, November 21th, 2012**

# **Evolution of the Czech Energy Policy in last decade**

**Jaroslav Knápek**

*Czech Technical University in Prague,  
FEE*

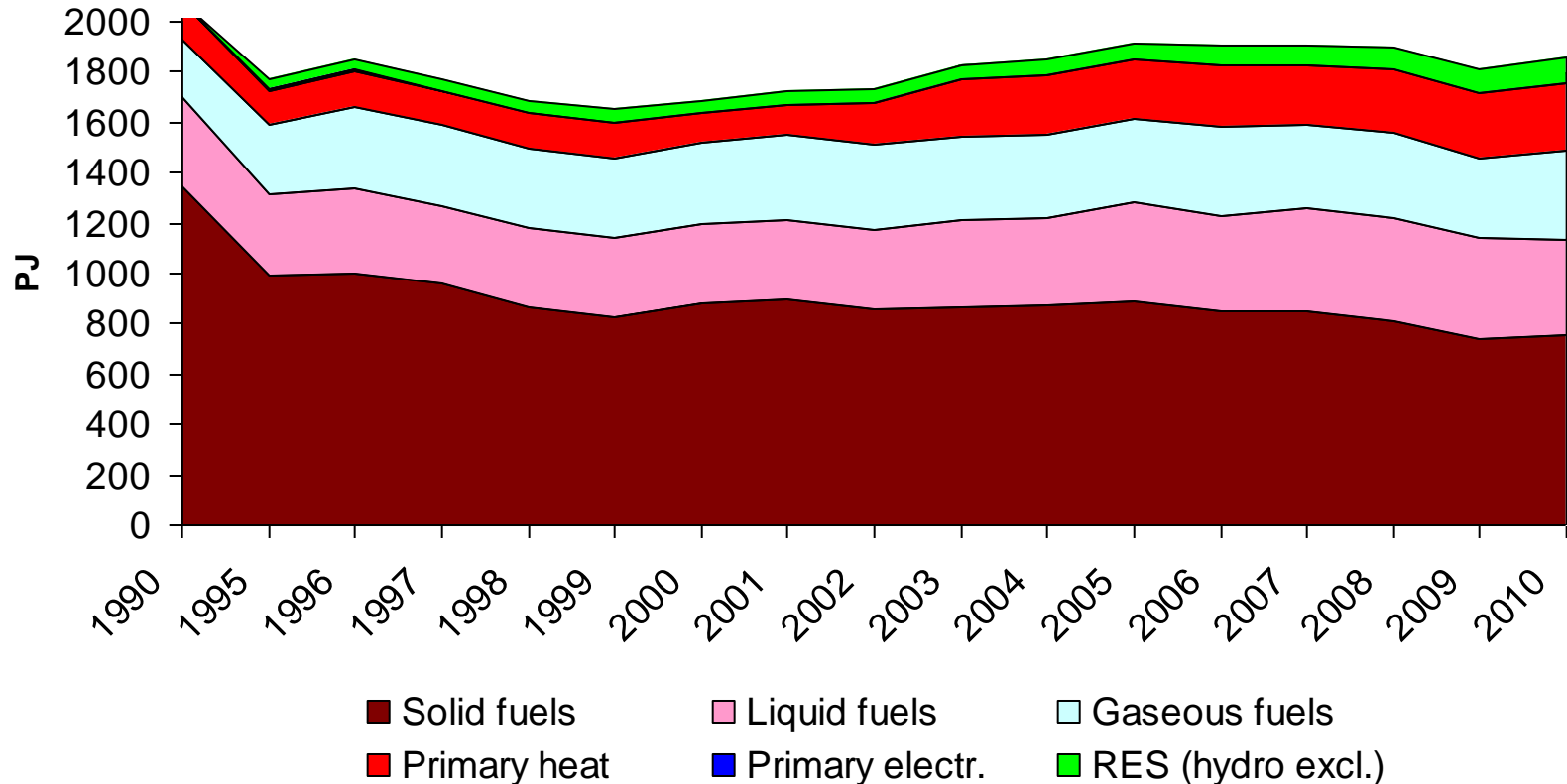




# Content

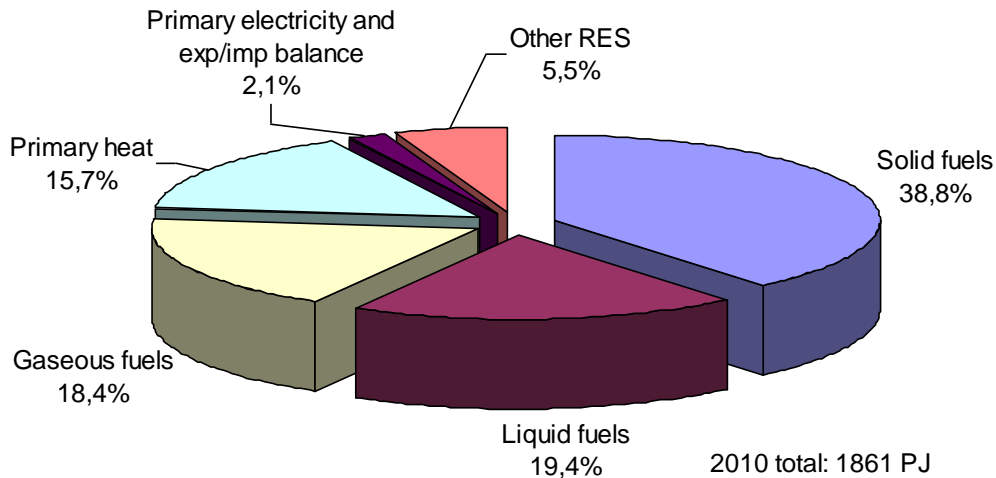
1. Selected figures on Czech energy branch development
2. SEP 2004
3. Process of SEP 2004 update
4. SEP 2012
5. Selected opened questions

# Development of PES consumption



1990: 2076 PJ, 2010: 1861 PJ

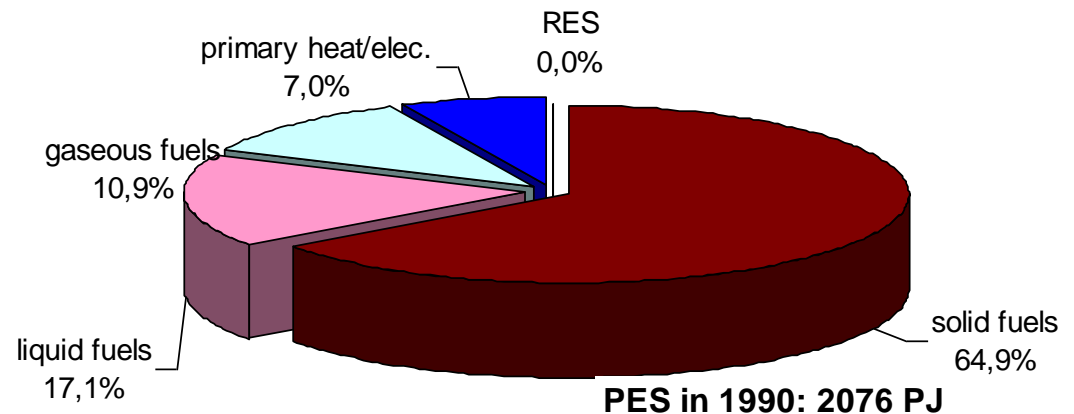
# Changes in PES structure



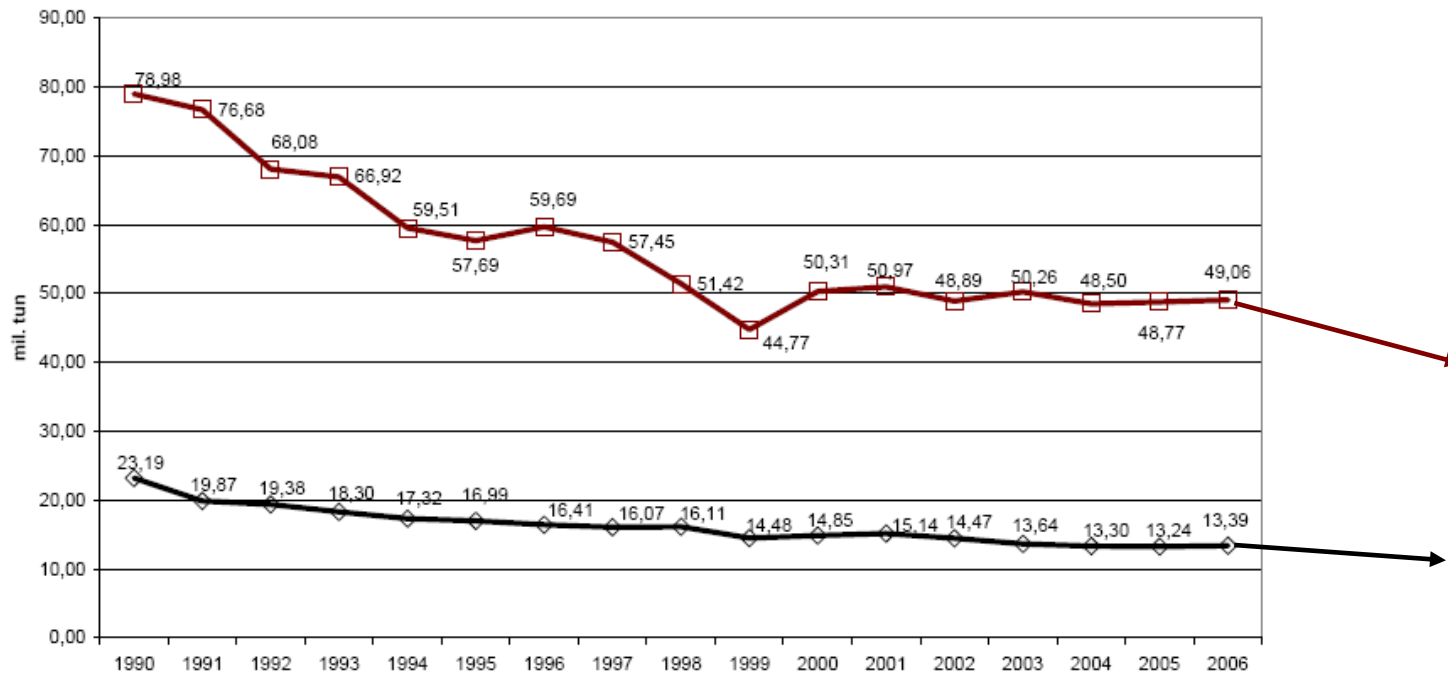
Decreasing role of (domestic) solid fuels

Increasing role of gas, nuclear and RES, but share of solid fuels is still high

## PES structure in 1990



# Domestic coal – continuously decreasing role



Domestic brown coal is becoming the „scarce“ resource

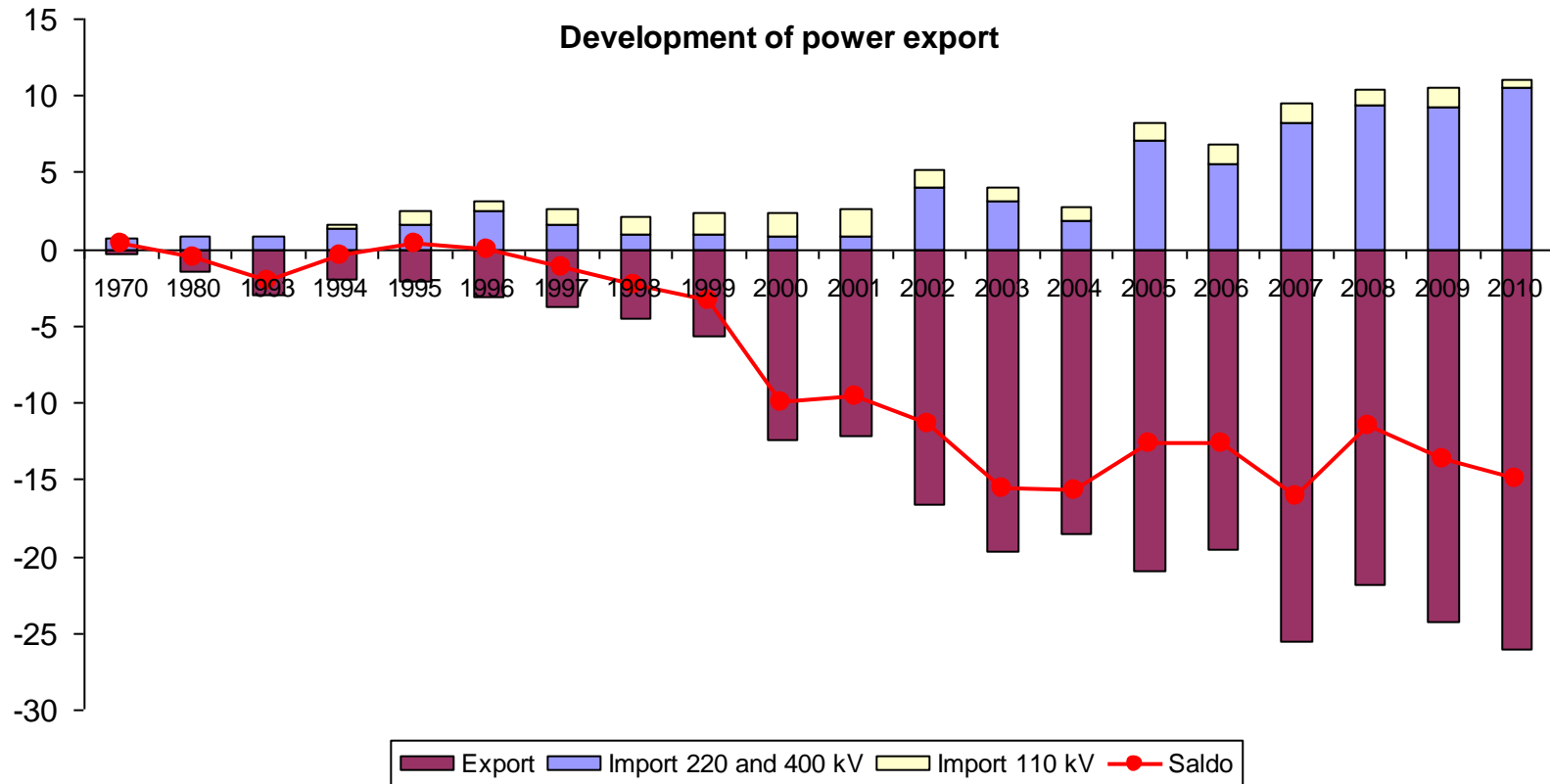
But reduction mainly caused by increasing power generation in nuclear and RES PP

2010: Hard coal 11,4 mil t, Brown coal: 43,8 mil. t

2008: Hard coal 12,6 mil t, Brown coal: 47,1 mil. t

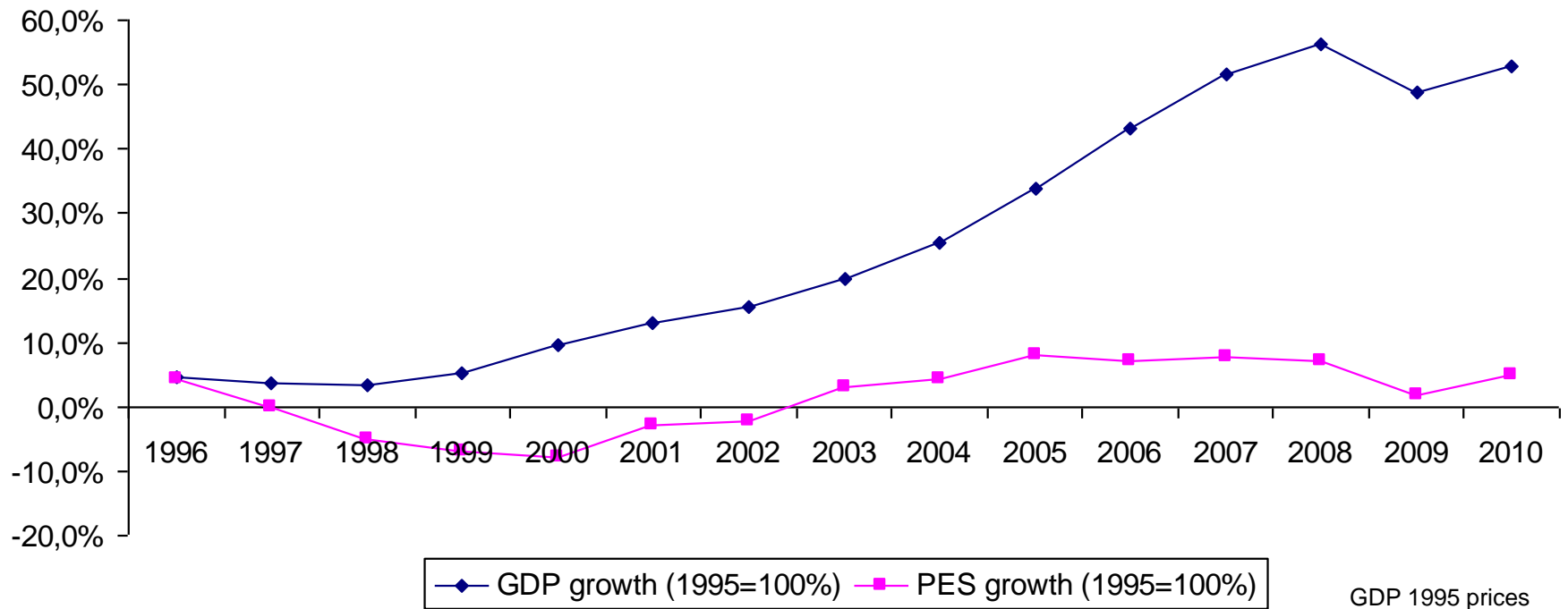
Hard coal 2010: 7,8 mil. t domestic consumption

# Czech Republic is the important power exporter

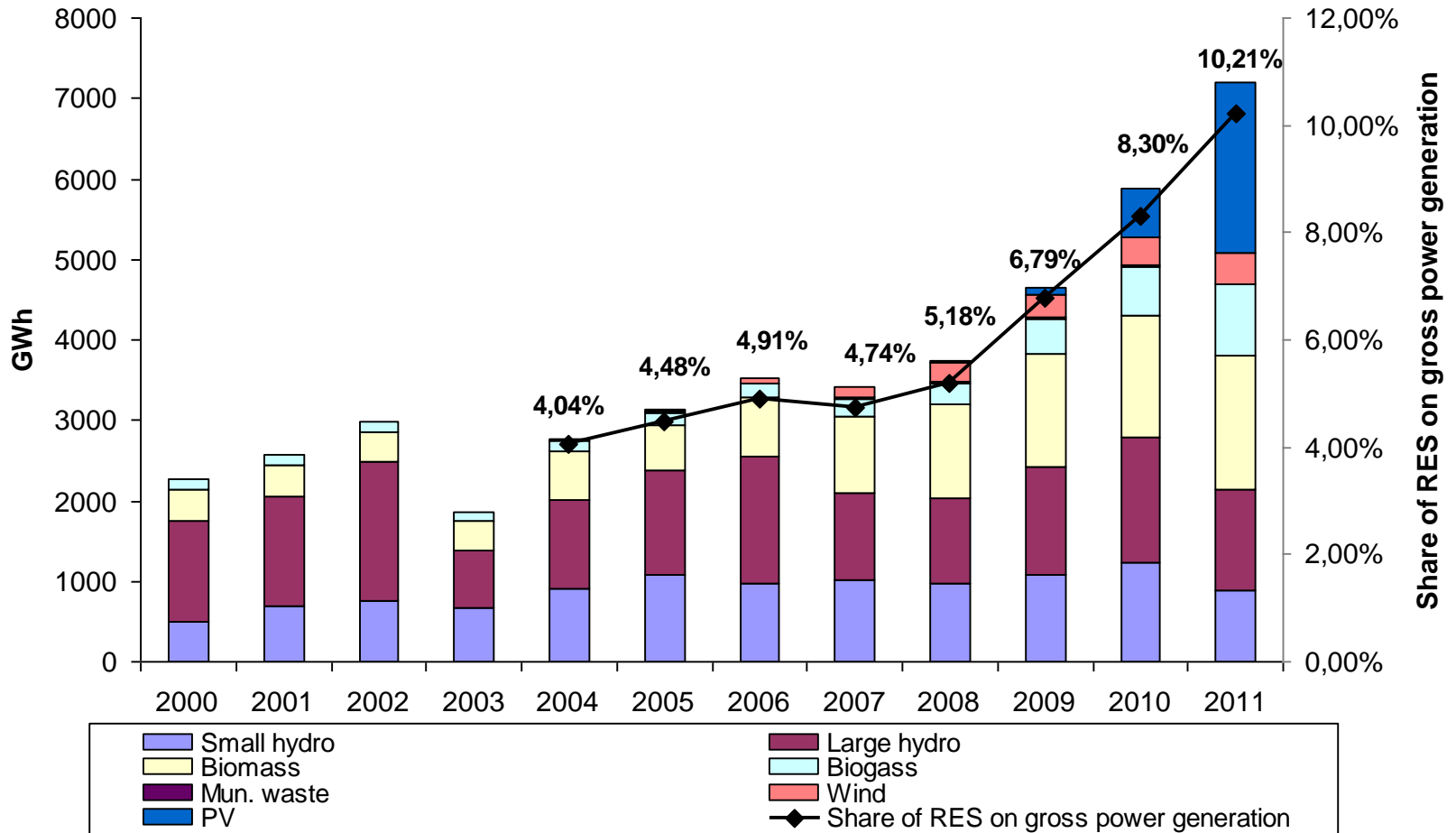


**2011** balance: net export 17 TWh (but what will be situation in 2020-2025 ?)

# GDP and PES development – increasing energy efficiency of national economy



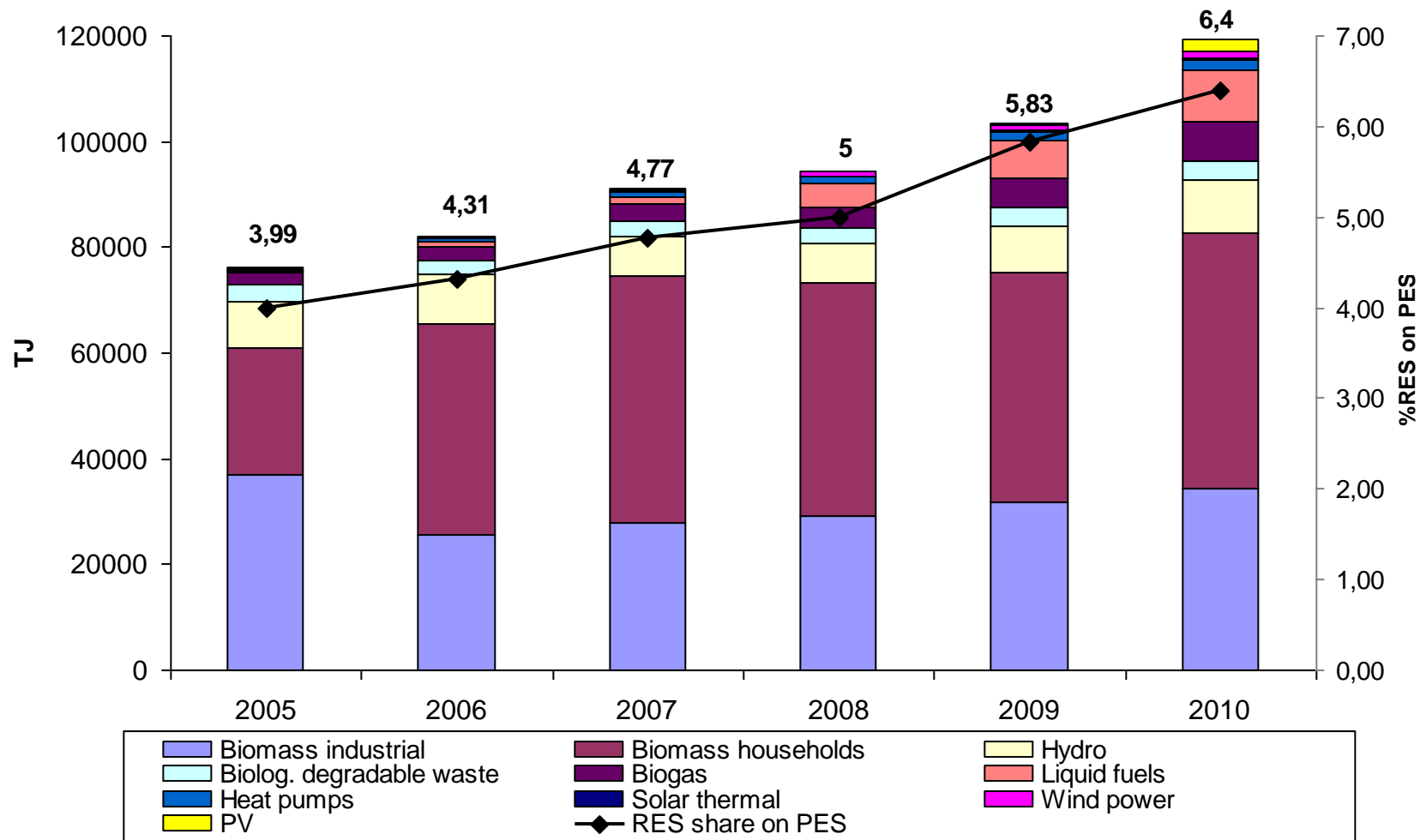
# RES – power generation



2010 indicative target (8%) fulfilled, 2011: 7,2 TWh

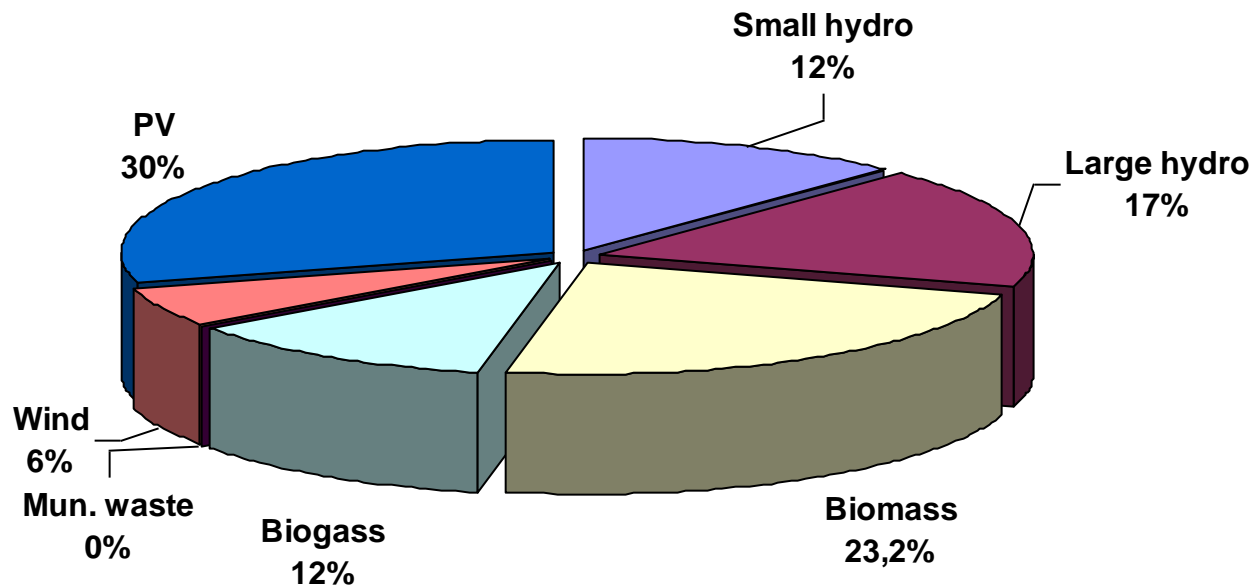


# RES – contribution to PES



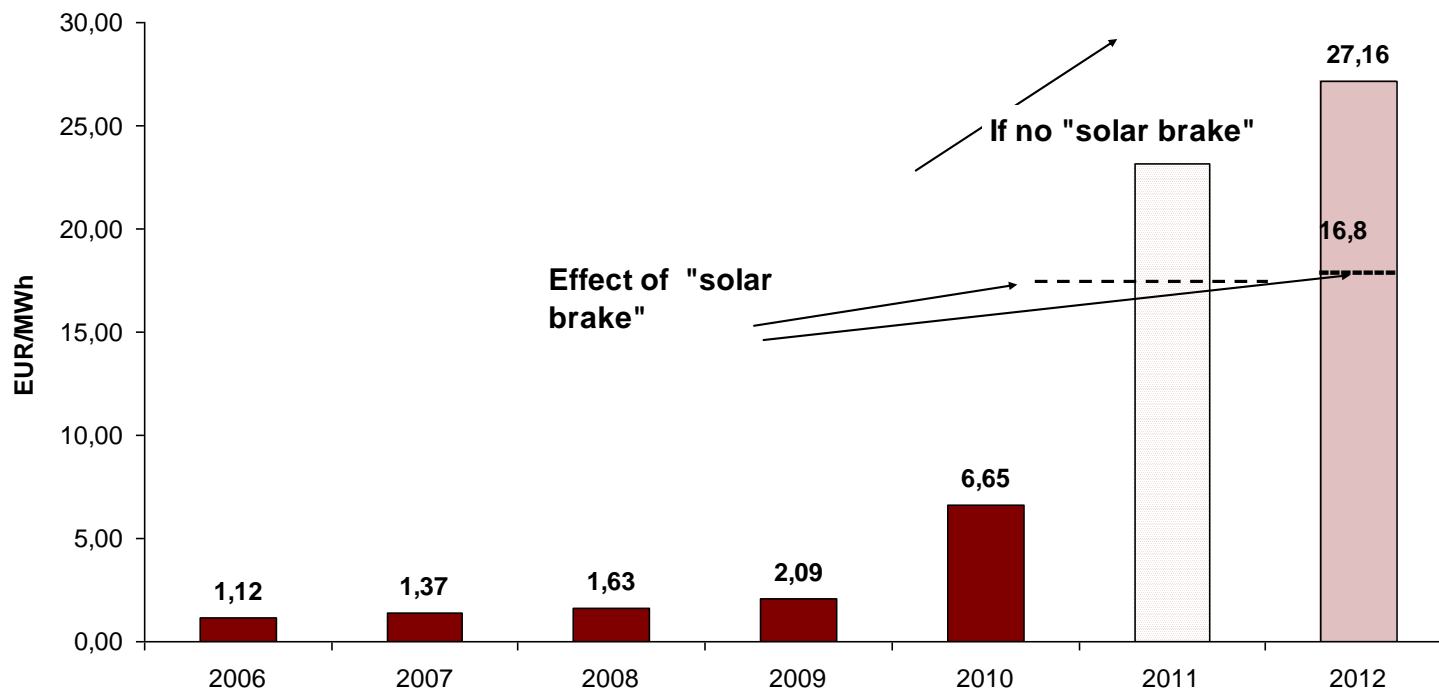
# RES power generation

## Structure of RES power generation in 2011



# RES-E support started to be the real problem in 2010(11)

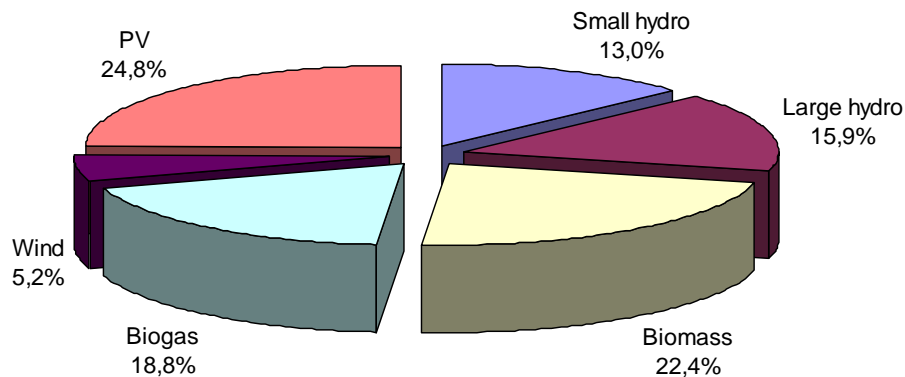
Till the end of 2010 cost of RES-E support scheme was fully transferred to the customers



Fee includes RES, cogeneration and non-traditional sources support  
RES share: more than 90%

# RES-E support started to be the real problem in 2010(11)

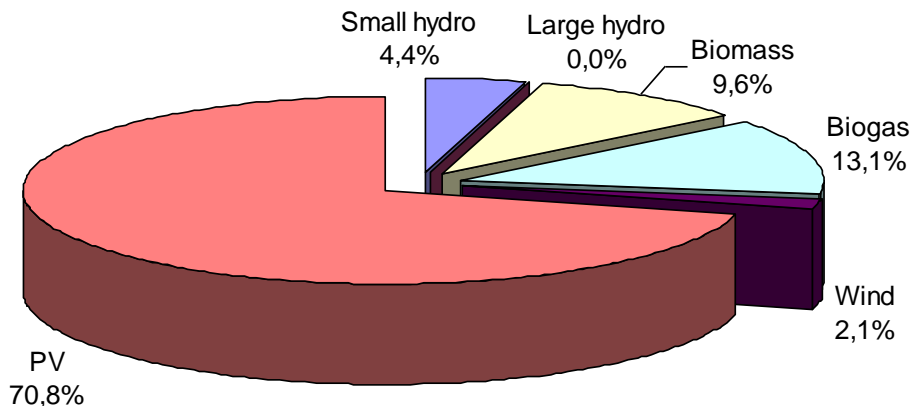
Individual shares on RES power generation  
2012 estimate



2012 estimate: 8,5 TWh

Source: own calculation

Individual shares on RES support cost  
2012 estimate



2012 estimate: 1,33 bil. EUR

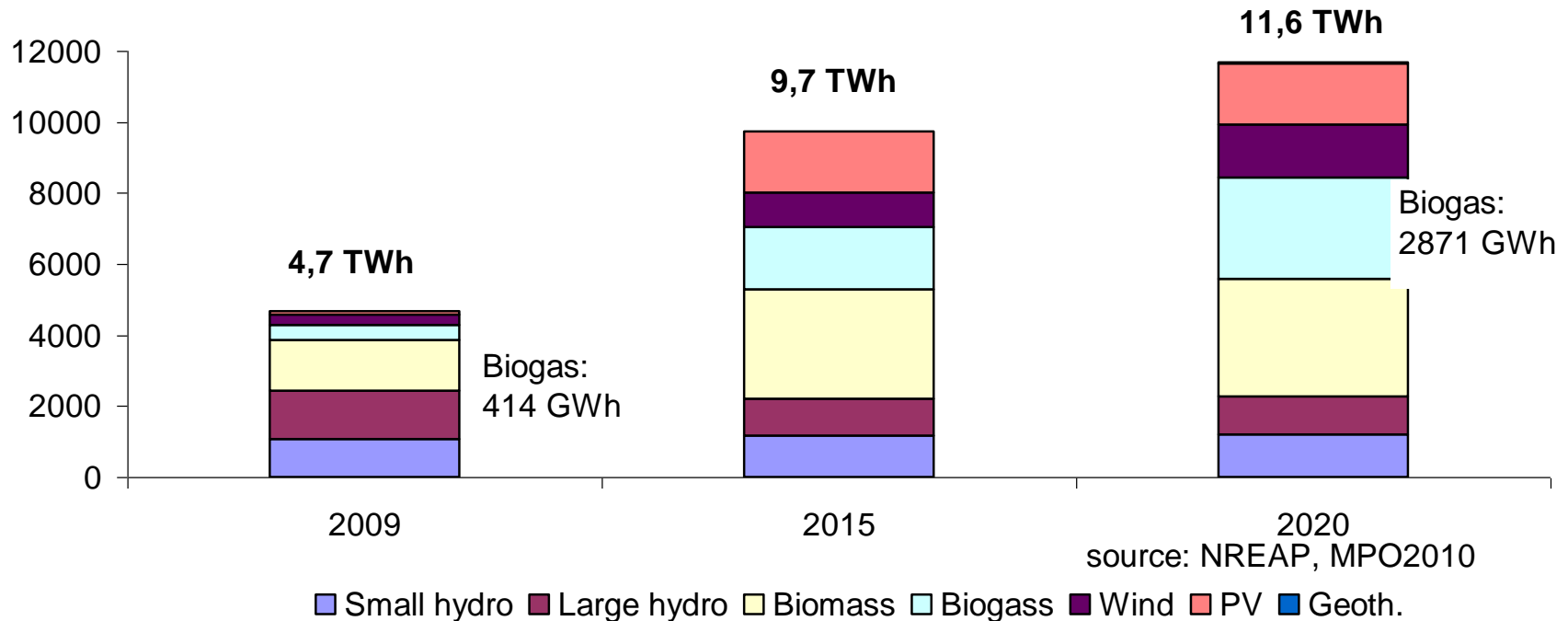
Source: own calculation

No excuse for any kind of consumers, problems:

- social (low income households)
- economic (competitiveness of industrial companies)

# Biomass (biogas) is discussed to be the new threat

## NREAP (2010)



Only biogas stations (assuming current values for biogas FIT and price of power) means additional app. 6 bil. CZK/year

# State Energy Policy 2004

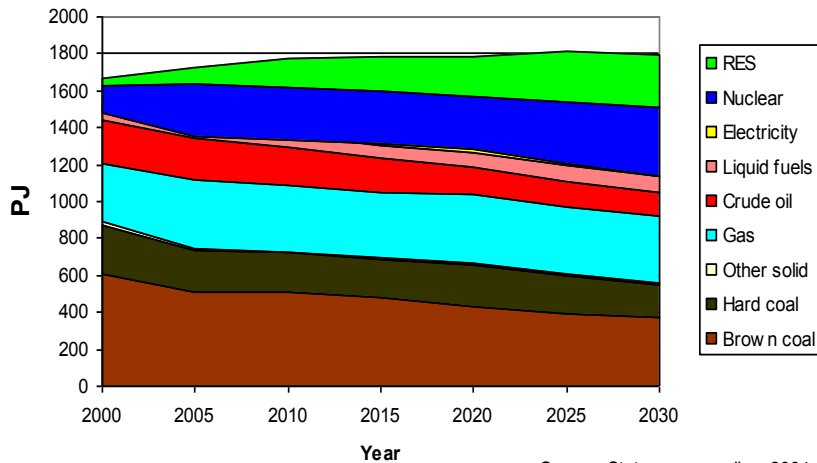
- Priorities, aims and measures – horizon 2030
- Priorities: Energy independency, safety and sustainability
- Approved by the government in March, 2004 (gov. resolution 211/2004)

## Aims:

- maximization of energy efficiency (annual reduction of energy intensity 3-3,5%), stabilize absolute PES consumption
- diversification of PES structure: solid 30-32%, gaseous 20-22%, liquid 11-12%, nuclear 20-22%, **RES 15-16%**
- limits for import dependency: 2020: 50%, 2030: 60%
- fulfillment of Kyoto protocol
- finish of energy branch transformation

# State Energy Policy 2004

Structure of primary energy sources

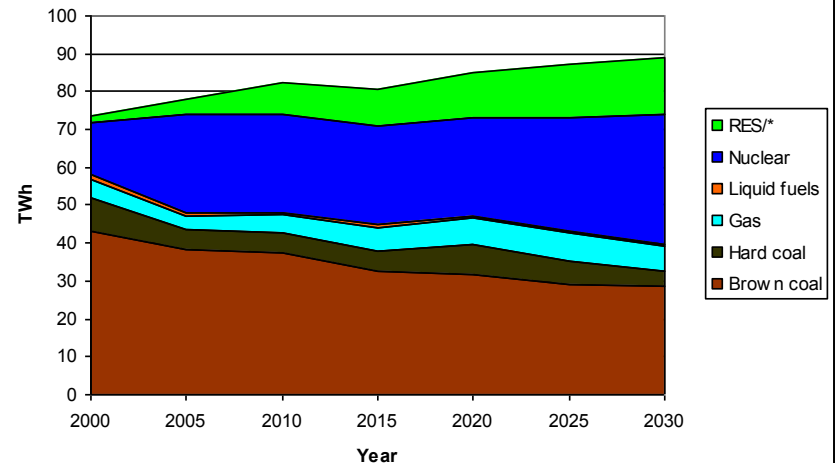


| Share of RES | 2000   | 2005   | 2010   | 2015   |
|--------------|--------|--------|--------|--------|
|              | 2,63%  | 5,38%  | 8,96%  | 10,49% |
|              | 2020   | 2025   | 2030   |        |
|              | 12,03% | 14,86% | 15,75% |        |

Implicit assumption on new nuclear power block behind 2020

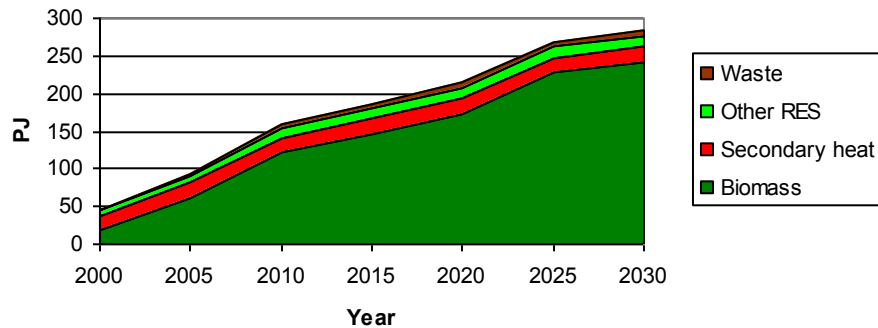
| Share of RES | 2000   | 2005   | 2010   | 2015   |
|--------------|--------|--------|--------|--------|
|              | 2,32%  | 5,32%  | 9,92%  | 12,17% |
|              | 2020   | 2025   | 2030   |        |
|              | 13,63% | 16,23% | 16,89% |        |

Structure of electricity production



# State Energy Policy 2004 - 2

Structure of used RES and "non-traditional sources"



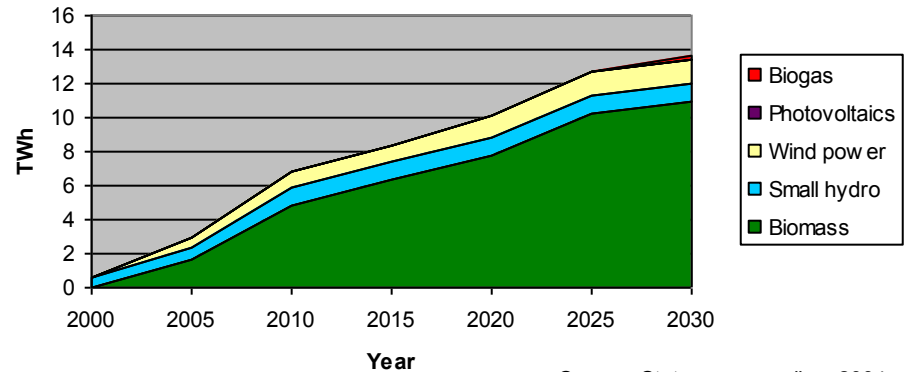
Source: State energy policy, 2004

| Share of biomass | 2000   | 2005   | 2010   | 2015   |
|------------------|--------|--------|--------|--------|
|                  | 40,91% | 66,67% | 76,10% | 78,07% |
|                  | 2020   | 2025   | 2030   |        |
|                  | 80,47% | 84,76% | 85,51% |        |

## Dominant role of biomass

| Share of biomass | 2000   | 2005   | 2010   | 2015   |
|------------------|--------|--------|--------|--------|
|                  | 1,82%  | 53,69% | 70,95% | 75,33% |
|                  | 2020   | 2025   | 2030   |        |
|                  | 77,17% | 80,33% | 80,47% |        |

Structure of electricity generation from RES



Source: State energy policy, 2004



# Process of SEP 2004 update

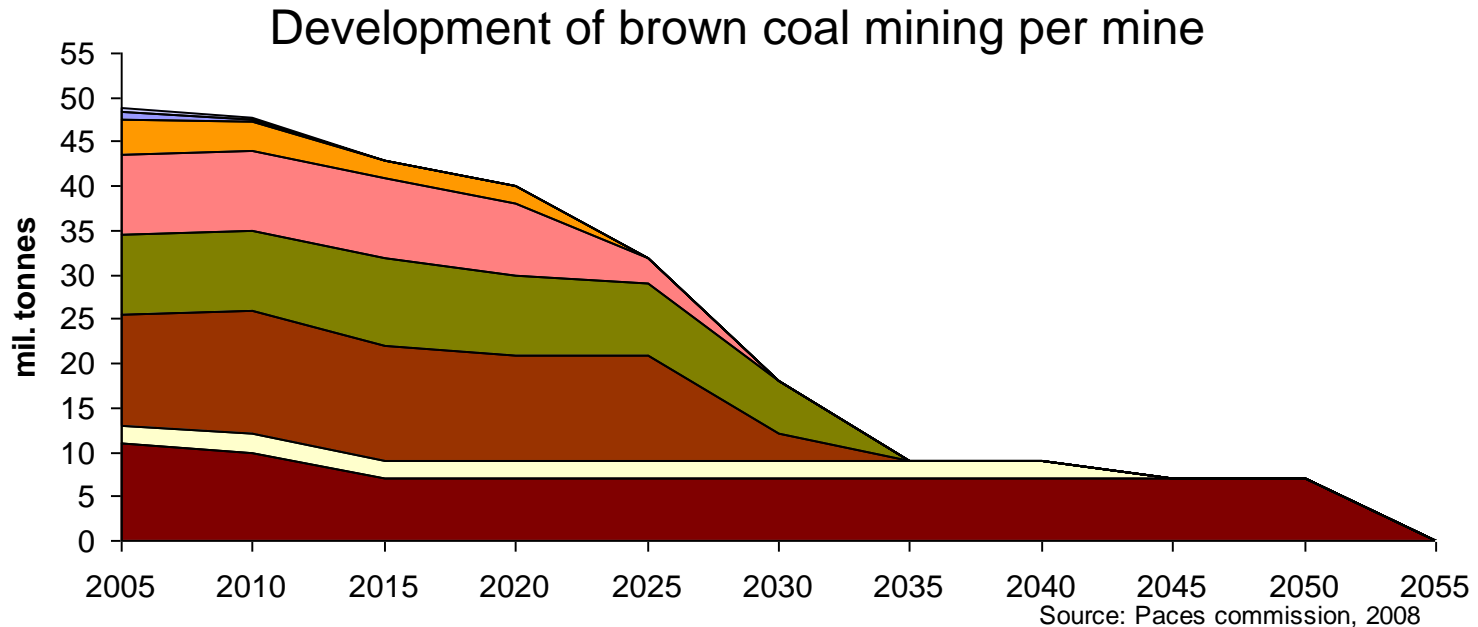
SEP: periodical update (5 years period at least)

## Opened questions:

- availability of coal and continuation of coal mining (esp. brown coal in N-B region)
- future role of nuclear power
- role of RES

„Independent expert commission“ established in 2007, report 2008

# Process of SEP 2004 update - 2



Highly sensitive political, economic and social problem, regional coal limits defined by resolution of the Czech government No. 444/1991, quickly decreasing coal reserves within the regional limits, but significant potential behind

e.g. ensuring coal deliveries to centralized heating systems is being currently discussed

# Process of SEP 2004 update - 3

Priorities identified in final report of Independent Expert Commission:

- continuation of nuclear power utilization;
- acceleration of renewable energy sources development; and
- preference for domestic coal use for heat (CHP) production

Political crisis in 2009-2010: preparation and approval of SEP slowed down (several versions of SEP prepared in 2010-2011)

The SEP update was submitted to the government for approval on 12 September 2012, along with an update of the Raw Material Policy

SEP noted by the government in November 8, 2012, government asked for EIA (for final legal approval), RMP postponed (opened questions related with the coal mining)

# SEP 2012 priorities

## **SEP priorities:**

- Develop a balanced mix of primary energy sources (PES), including effective utilization of all available domestic sources, securing of self-sufficiency in power generation and preserving a positive (net exporter) balance of power export/import.
- Increase energy efficiency and energy savings.
- Develop the Czech grid infrastructure, enhancement of international cooperation and integration of power and gas markets.
- Support research and development to maintain competitiveness of the Czech energy sector.
- Improving energy safety and security of supply

# SEP 2012 – changes in fuel mix

## Structure of power generation

| Primary source                   | 2010 | 2040   |
|----------------------------------|------|--------|
| Nuclear                          | 33%  | 50-60% |
| Brown and hard coal              | 55%  | 17-22% |
| Natural gas                      | 1%   | 5-15%  |
| RES, secondary and other sources | 11%  | 18-25% |

## Structure of PES consumption

| Primary source                    | 2010 | 2040   |
|-----------------------------------|------|--------|
| Nuclear                           | 16%  | 30-35% |
| Solid fuels (Brown and hard coal) | 40%  | 12-17% |
| Gaseous fuels (Natural gas)       | 18%  | 20-25% |
| RES, secondary and other sources  | 6%   | 17-22% |
| Liquid fuels                      | 20%  | 14-17% |

# SEP 2012 – balanced mix of PES

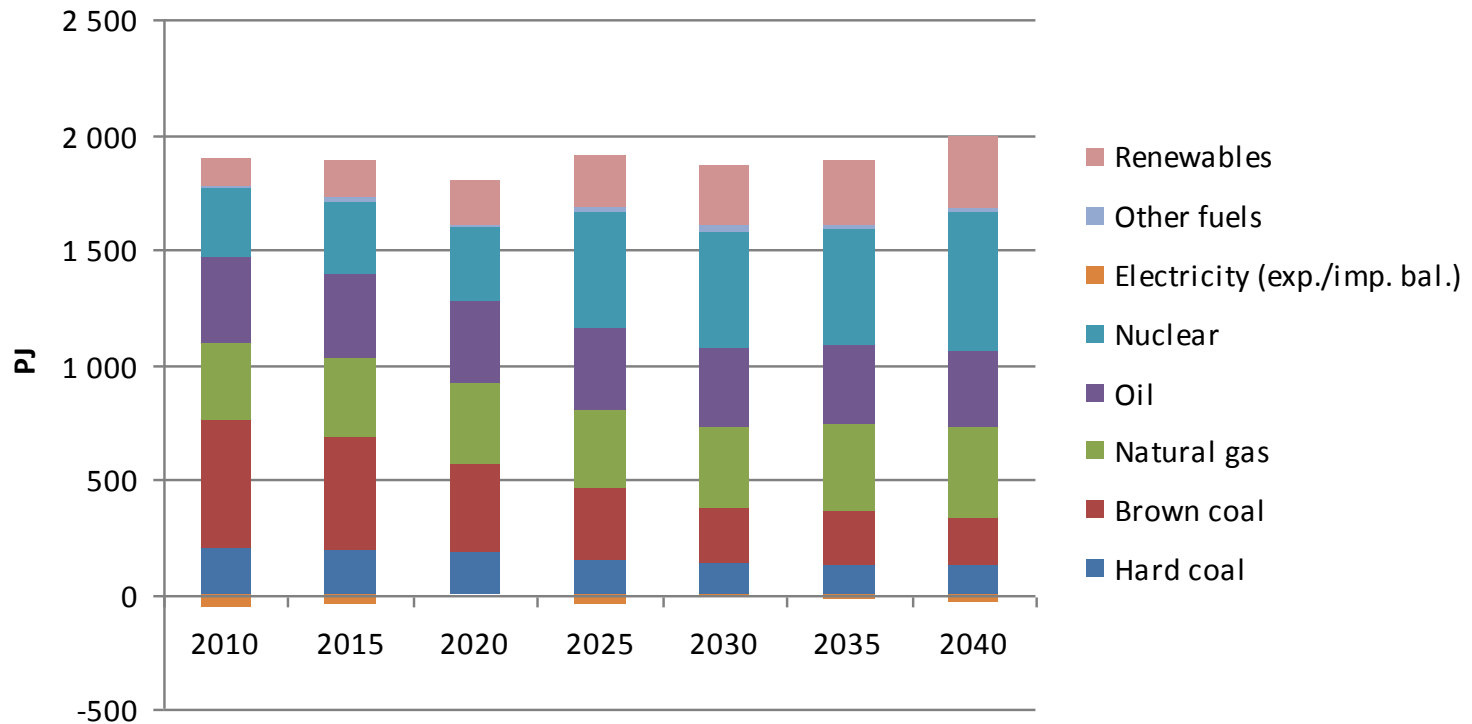
- extension of currently existing NPP operation (beyond 2040)
- construction of 2 new block in Temelin (tender for general supplier is opened)
- construction of new NPP block in Dukovany beyond 2040
- development of economically effective RES, gradual elimination of operating financial support for the new RES capacity, similar target as in 2004 for RES
- significant increase in the generation of energy from waste
- preservation of domestic coal based power generation at the level of 15-20TWh/year
- development of power generation from NG, target installed capacity of maximum 15% of the total installed power
- renewal and stabilization of central heating systems (CHS)
- maximum acceptable value of PES import dependency is 65% by 2030 and 70% by 2040

# SEP 2012 – energy efficiency, savings and infrastructure

- utilization of the best available technology parameters for all newly built and reconstructed power, cogeneration and heating plants
- reduction of low efficiency power generation through economic incentives
- reconstruction of the majority of existing heating plants into highly efficient cogeneration plants
- preservation of the transit role in gas transmission and strengthening of cross border connections in a north-south direction
- preservation of storage capacity in natural gas underground storage facilities at 40% of domestic annual natural gas consumption, peak within-day capacity to be maintained at 70% of annual daily consumption in the winter season
- to ensure long term availability of domestic coal for CHS (with a preference of domestic coal use for heat production, ahead of power generation)

# SEP 2012 – Development of PES

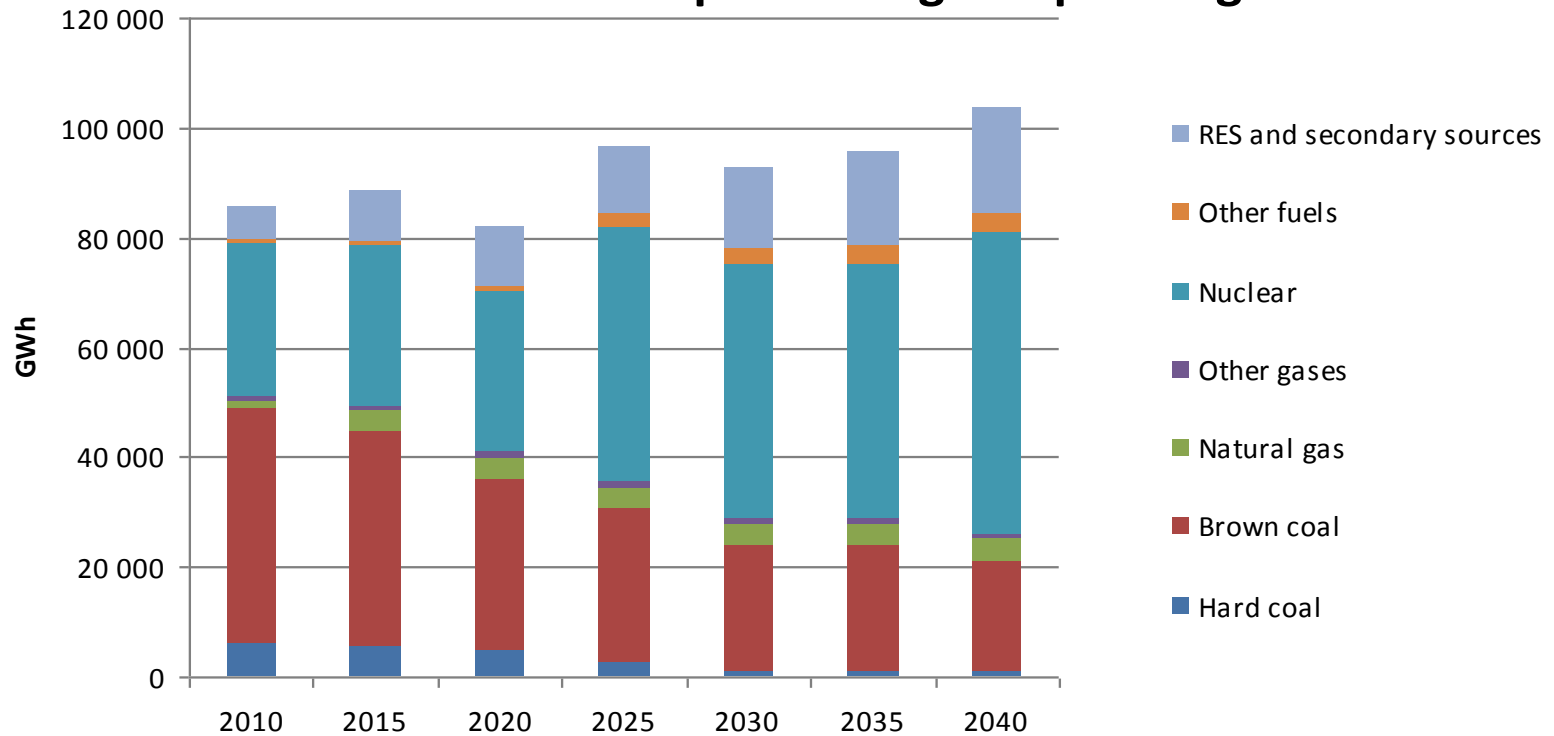
## Structure and development of PES





# SEP 2012 – Development of power generation

## Structure and development of gross power generation



# Selected „opened“ questions

- Availability of domestic (brown) coal
- Renewal of coal fired PP
- Construction of 2 blocks in Temelin
  - Questions related with the tender (who will be selected as the general supplier of the technology ?)
  - Financing issues
  - Economic effectiveness (future price of electricity, uncertainty with carbon price, etc. )
  - Time schedule of construction, etc.
- Future structure of national economy
- RES policy and support scheme
  - decisive role of biomass in perspective 2030-2040)
  - Action Plan for Biomass 2012-2020 approved by government in Sept. 2012



*Thank you for your attention !*

*Děkuji za pozornost!*