



Môže Slovensko zabezpečiť dodávky energie a trvalo udržateľný rozvoj bez jadrových zdrojov?

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# Nuclear Research Institute Řež View

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# Introduction

1. EU policy in energy and energy sector forecast
2. Economy for base load electricity production
3. ÚJV Řež view on situation in ČR and our activities
4. Conclusions

# 1. EU policy in energy and energy sector forecast

Ø Discussion on energy policy in EU is described in GREEN BOOK [1]. The main challenges are:

Ø The EU will become increasingly dependent on external energy sources, it will reach 70% in 2030

Ø The EU has very limited scope to influence energy supply conditions

Ø At present the EU is not in a position to respond to the challenges of climate change and to meet its commitments, notably under the Kyoto Protocol

# 1. EU policy in energy and energy sector forecast

Ø The EU has not yet clear energy policy, however some indications shows shift in its position to nuclear energy [3]:

Ø Sustainable development is now defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”

Ø Measure for energy conservation and improvement in the efficiency of energy use will not be sufficient and R&D is needed in particular for renewable and nuclear energy.

# 1. EU policy in energy and energy sector forecast

Ø EU forecast for energy and transport sector is given in [4] for EU as well as for member states, comparing data for EU, ČR and SR:

Ø SR is predicted to decrease amount of electricity generated in nuclear

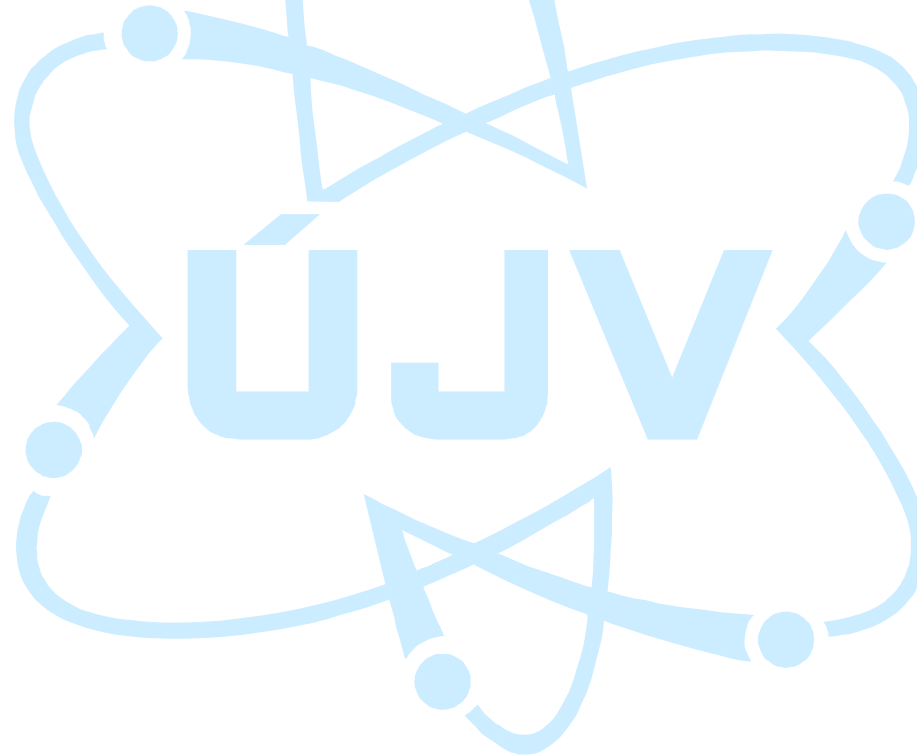
Ø At the same time it is forecasted [4] 80 GWe in NPPs to be installed in EU 15 in 2020-2030 as replacement of present installations

Ø This will increase all the negatives aspects mentioned in GREEN BOOK including the non-compliance with Kyoto Protocol

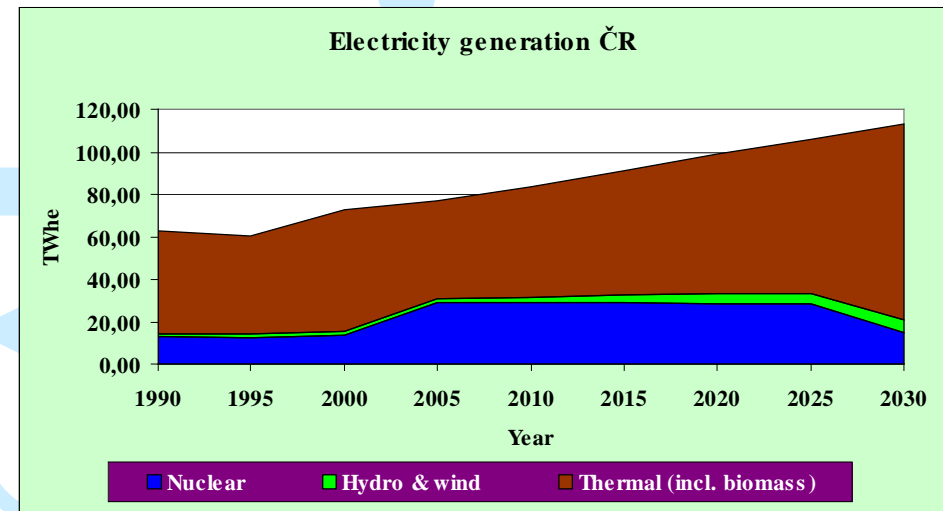
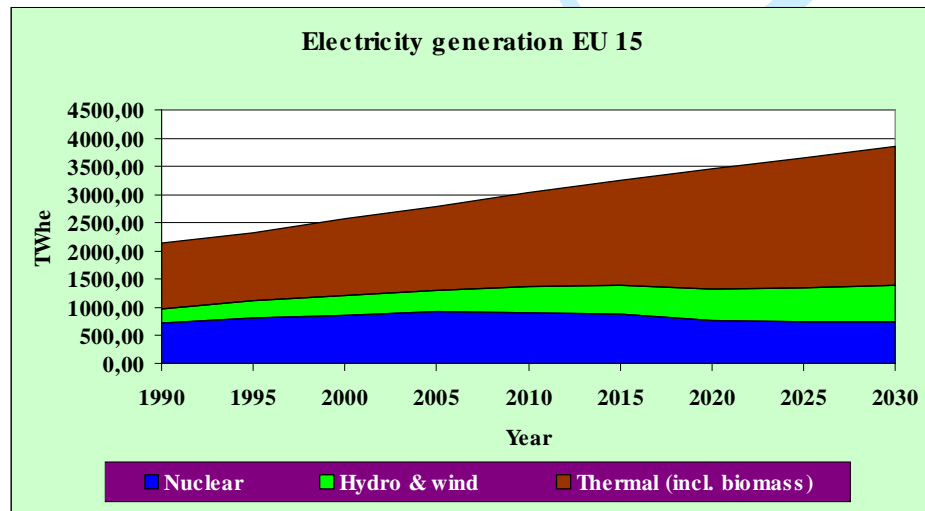
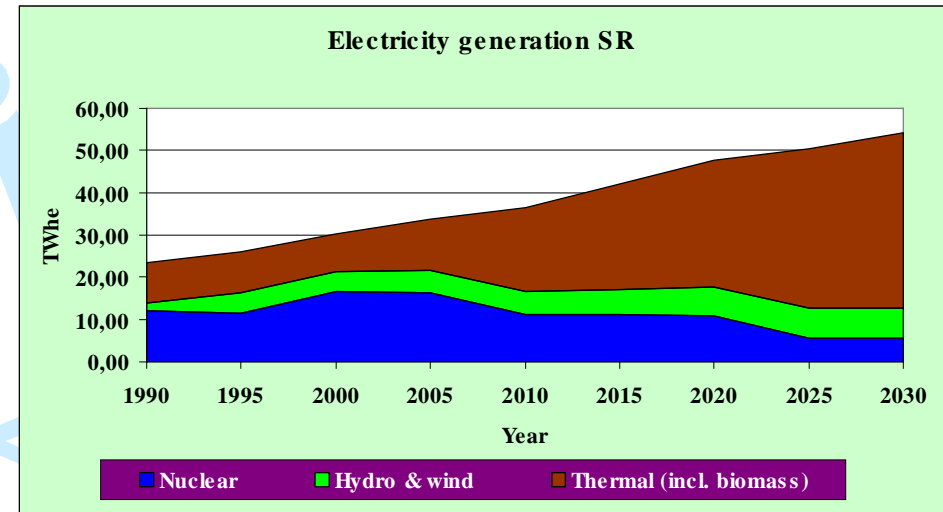
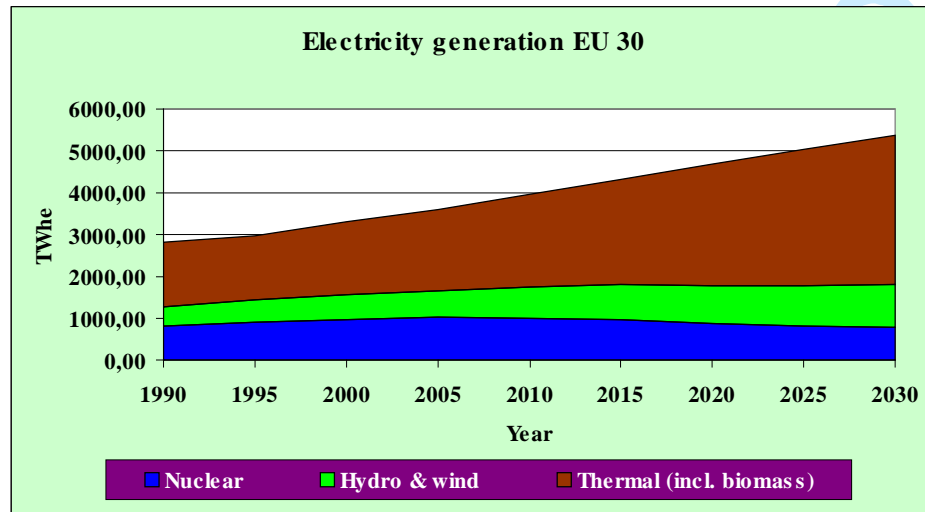
Ø Electricity generation in SR will be less sustainable, more import dependent and subjected to high risk

# 1. EU policy in energy and energy sector forecast

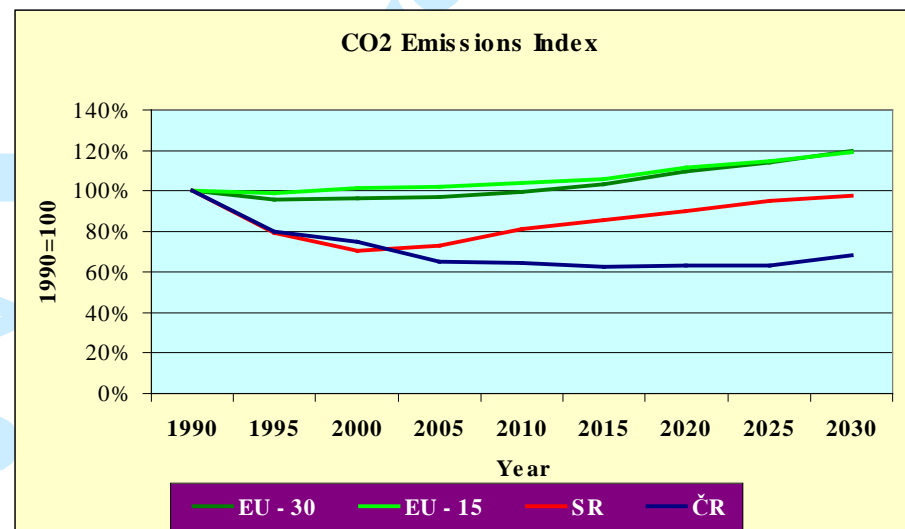
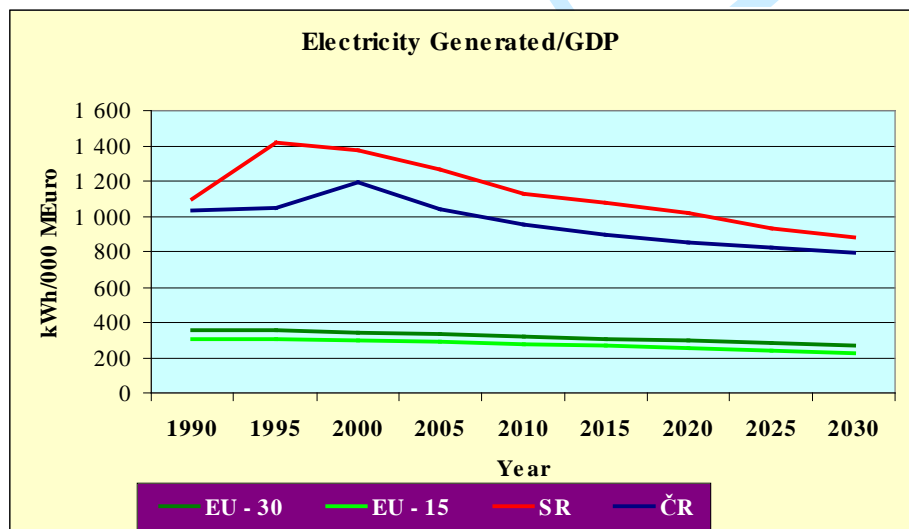
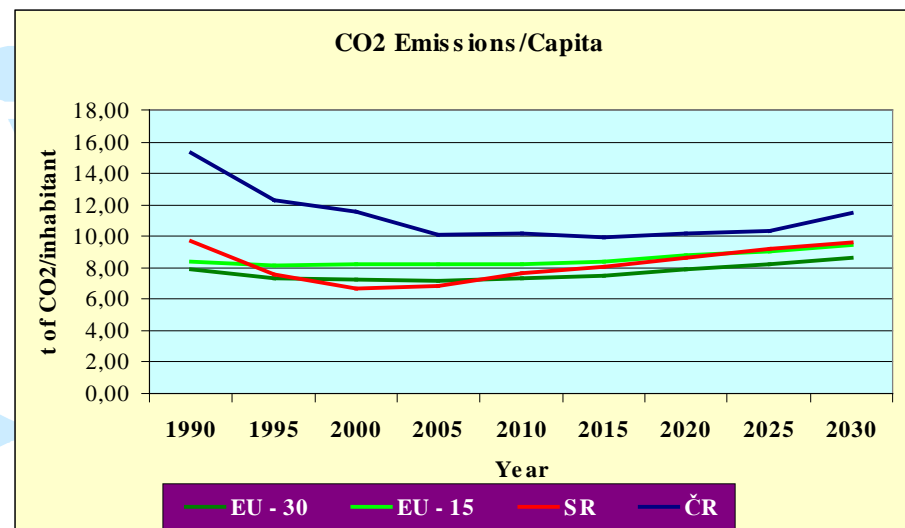
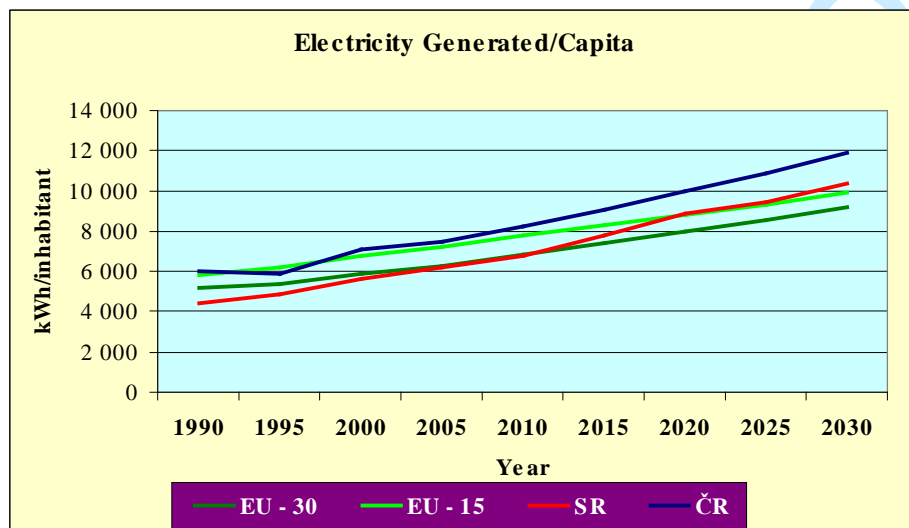
Ø EU member states must start to solve the EU challenges preferably on their level



# Composition of electricity generation as presented in [4]

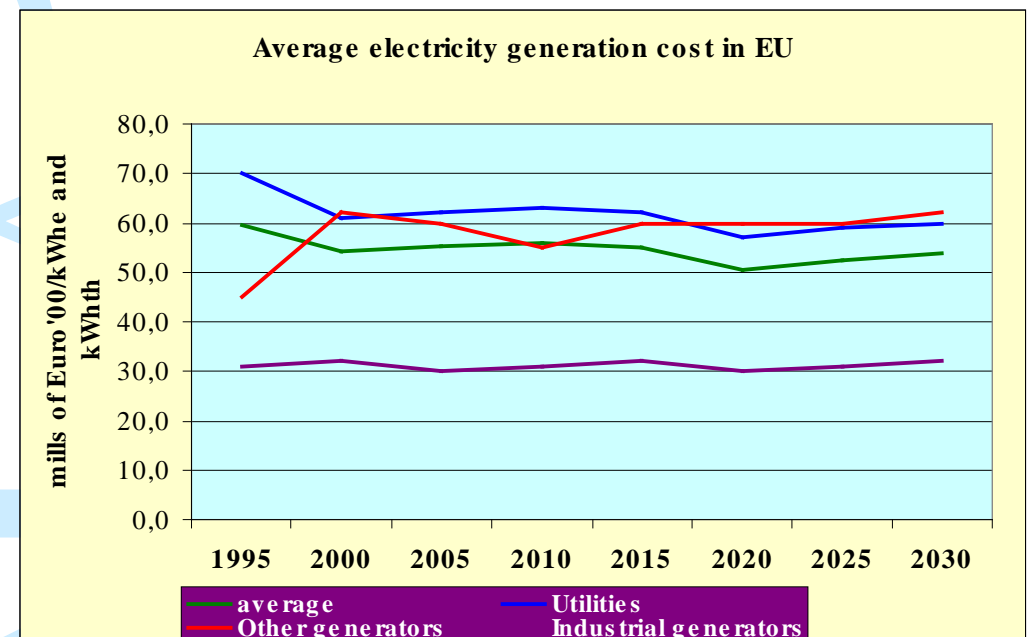
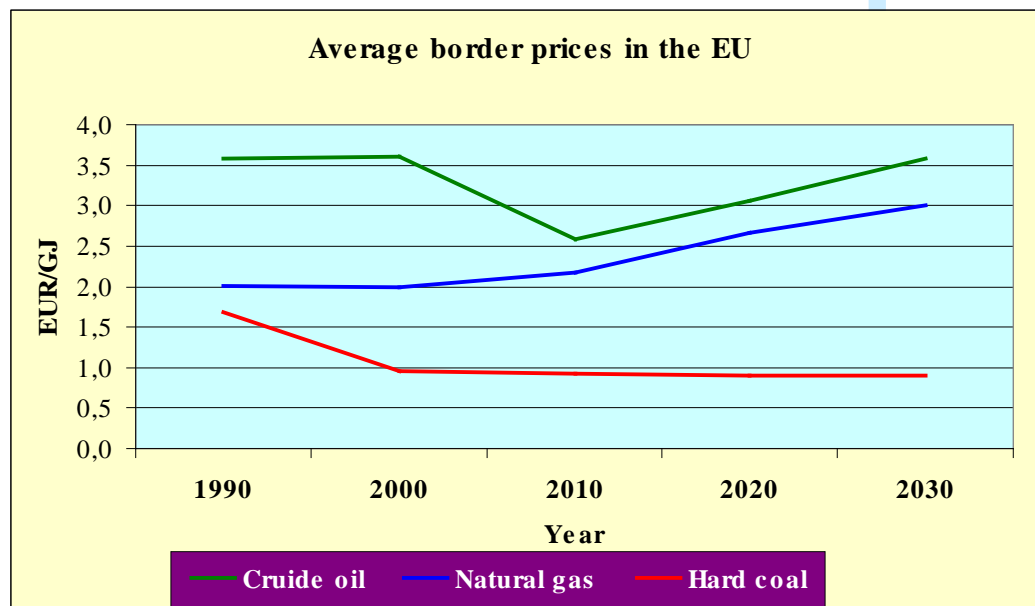


# Electricity generation and CO<sub>2</sub> emissions as presented in [4]





# Electricity generation cost and fossil resources prices as presented in [4]

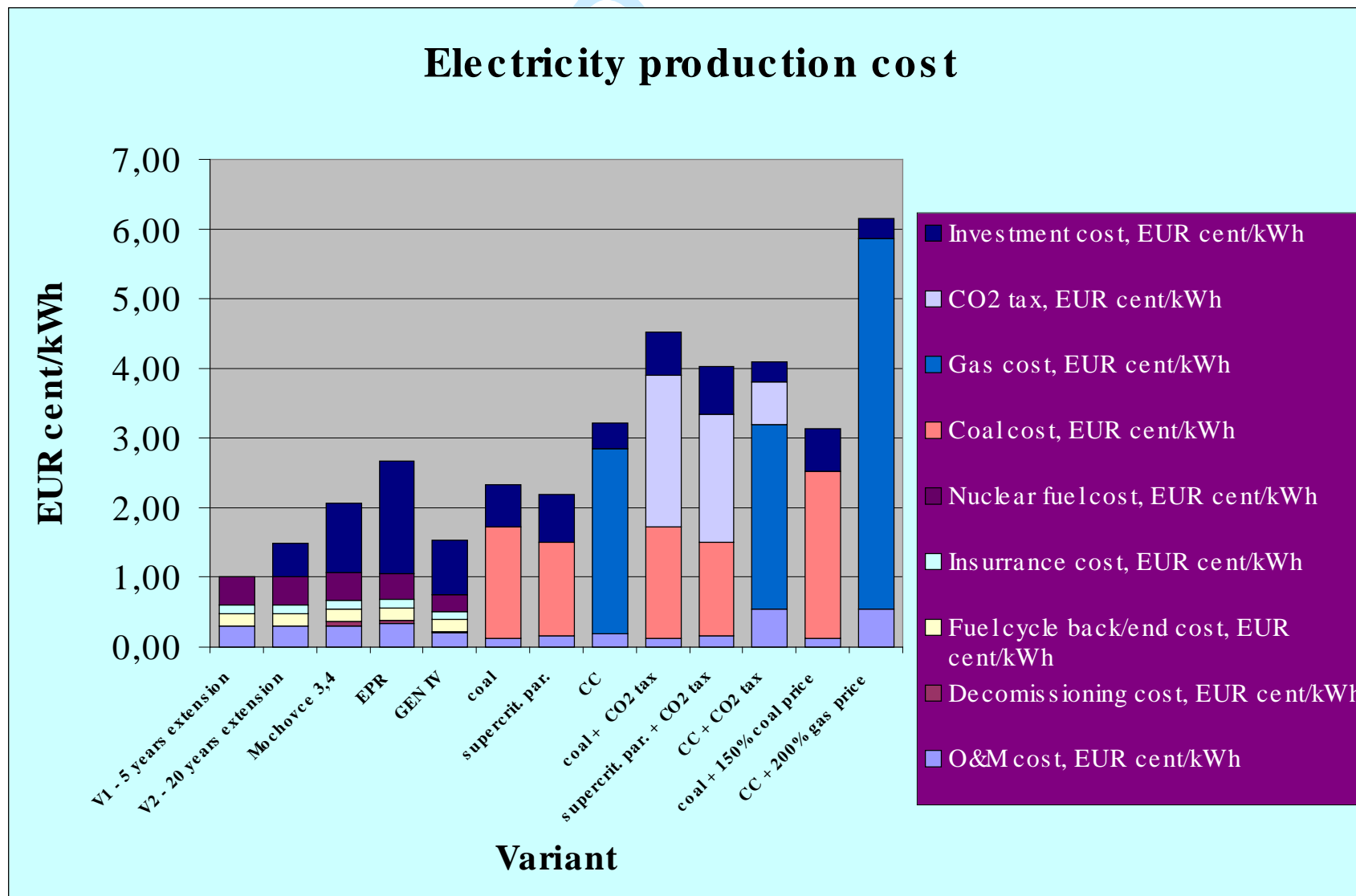


## 2. Economy for base load electricity production

### Base load electricity production in SR:

- Ø Nuclear (lifetime extension, finalization of Mochovce 3&4, coal and gas were compared
- Ø Sensitivity to CO<sub>2</sub> tax were examined (20 €/t CO<sub>2</sub>, in [2] potential range is 5.5 – 13.5 €/t for 2010 and 30 – 60 €/t for 2030)
- Ø Additionally impact of 50% increase of coal price and 100% increase of gas price were evaluated
- Ø All assumptions are in following figure.

## Base load electricity generation cost – results



## 2. Economy for base load electricity production

### Conclusions:

- Ø Lifetime extensions of exiting NPPs is the cheapest solution (in different cases depending only on investment required)
- Ø Finalization of Mochovce 3&4 is slightly cheaper then coal power plant and much more cheaper the gas power plant (CC) or EPR NPP
- Ø GEN IV with its target paraeters is the cheapest potential option new installations are not available now (target dates (2025 – 2030)
- Ø Potential impact of CO<sub>2</sub> tax or price increase of coal and gas strongly favours all nuclear option

### 3. ÚJV Řež view on situation in ČR and our activities

- Ø **ČR needs nuclear energy now and even more in long term**
- Ø **Save and reliable long term operation of our NPPs is everyday task**
- Ø **Preparation of new NPP of GENERATION III+ must start soon**
- Ø **Participation on R&D for GEN IV is important for new installations after 2025**

# Conclusions

Ø Lifetime extension and finalization of Mochovce 3&4 is the cheapest solution for base load production of electricity and is in line with EU energy challenges:

Ø decrease CO<sub>2</sub> emissions

Ø dependence on energy sources from politically unstable regions

Ø decrease import dependence on energy resources

# Conclusions

- Ø Nuclear energy is one of important sources for long term sustainability in energy.
- Ø GEN IV if successful will meet the new requirements after 2025.
- Ø We should participate on this long term development effort

## References

- 1] GREEN PAPER. Towards a European strategy for the security of energy supply. EC, 2001.**
- [2] World energy, technology and climate policy outlook 2030 – WETO. EC Community Research. EUR 20366 EN. 2003.**
- [3] THE ENERGY CHALLENGE OF THE 21<sup>ST</sup> CENTURY: The role of nuclear energy. EC Community Research. Scientific and Technical Committee EURATOM. EUR 20634 EN. 2003.**
- [4] EUROPEAN ENERGY AND TRANSPORT TRENDS TO 2030. EC Directorate-General for Energy and Transport. 1683-142X. January 2003.**