SLOVAK ENERGY POLICY
Synergies between Nuclear and Renewable Energy towards low carbon power production

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WORKSHOP IEA „NUCLEAR POWER IN A CLEAN ENERGY SYSTEM“
Paris, 25 February, 2019
Fundamentals of EP SK

- High import dependency and ensuring reliability of supply
- European energy union
- Climate change and its consequences
- Impact on competitiveness of economy
- Use of renewable energy sources and increasing energy efficiency
- High energy intensity of economy
- Independent nuclear energy policy
- European energy union

Impact on competitiveness of economy
HIGH ENERGY DEPENDENCE ON RUSSIAN FEDERATION

IMPORTS FROM RUSSIA:

• 90% of primary energy sources

• 100% nuclear fuel (uranium from FR)

• 99% oil

• 98% natural gas

DOMESTIC ENERGY SOURCES:

• Brown coal
Energy Policy of the Slovak Republic

- Approved by the Slovak government in November 2014
- Slovak energy policy outlook until 2030

Strategic objective: to secure competitive, effective, reliable and low-carbon supply of energy for affordable prices, while taking into account consumer protection and sustainable growth

Pillars of Energy Policy of SK

- Energy security
- Energy efficiency
- Competitiveness
- Sustainable energy
Global trends:
• To keep the increase in global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit it to 1.5°C – the Paris Agreement on climate change, 2015
• Decarbonization of economy, including energy sector

Transition to low-carbon economy in Slovakia:
• Portion of low-carbon technologies – nuclear, hydro and other renewables in total electricity generation in 2018 ca. 80 %
• Cornerstones: NUCLEAR (Base load) + HYDRO (Peak load: flow through+pump storage) = Stabilisation of power system
• Other renewables (biomass + PV) - on the rise
• Fossil fuels (domestic brown coal) – on the decline
• The share will further increase after completion of Mochovce NPP Units 3,4
ZERO CARBON POWER PRODUCTION IN EU

Source: EUROSTAT 2018
Structure of power production

Power production per year - 2017

RES: Biomass 6.8% + PV 2.1%

Hydro 17.6% 4676 GWh
Nuclear 53.8% 15081 GWh
Thermal 19.4% 5711 GWh
Other industrial sources 0.3%

Power production per day - 12 Feb 2019

- Pump hydro
- Hydro
- Nuclear
Construction of 1. large hydro power plant started in 1930s

Cascade of 15 large HPP on the river Vah

The largest flow through HPP – Gabčíkovo (720 MW) on the river Danube

More than 20 large hydro power plants built until 1992
LARGE HYDRO - Present

The largest flow through HPP Gabčíkovo (720 MW) on the river Danube

The largest pump storage HPP - Cierný Vah (735 MW)
• Use of nuclear energy is a key part of the Energy Policy of the Slovak Republic.
• Slovakia will continue to use nuclear energy as a safe, reliable, environmentally acceptable, verified and economically-viable electricity generation source.
• High public support thanks to sufficient level of dissemination of information
• Long-term support of the Slovak government
• High standards of nuclear safety
Slovakia has extensive experience in **planning, construction, operation and decommissioning** of nuclear power plants.

### J. BOHUNICE SITE

<table>
<thead>
<tr>
<th>facility</th>
<th>type</th>
<th>status</th>
<th>license holder</th>
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</thead>
<tbody>
<tr>
<td>NPP A-1</td>
<td>HWGCR</td>
<td>in decommissioning</td>
<td>JAVYS, a.s.</td>
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<tr>
<td>NPP V-1 (EBO1,2)</td>
<td>WWER 440/230</td>
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<td>JAVYS, a.s.</td>
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<td>NPP V-2 (EBO3,4)</td>
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<td>in operation</td>
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<tr>
<td>treatment of RAW</td>
<td>different techn.</td>
<td>in operation</td>
<td>JAVYS, a.s.</td>
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<tr>
<td>New NPP</td>
<td>feasibility study</td>
<td>under way</td>
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### MOCHOVCE SITE

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<tr>
<td>NPP EMO1,2</td>
<td>WWER 440/213</td>
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<td>SE, a.s.</td>
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<tr>
<td>Facility for Treatment of LqRAW</td>
<td></td>
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<tr>
<td>Ra-waste Repository</td>
<td>near surface</td>
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<td>NPP EMO3,4</td>
<td>WWER 440/213</td>
<td>under construction</td>
<td>SE, a.s.</td>
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</table>
1958 - Start of construction
1972 - 1977 – Power plant operation (First in Eastern Europe)
1999 – Start of decommissioning
NPP A1 BOHUNICE – IN DECOMMISSIONING

<table>
<thead>
<tr>
<th>Start of construction</th>
<th>Start of operation</th>
<th>End of operation</th>
<th>Gov. decision of decommissioning</th>
<th>Putting the NPP A-1 into radiation safe state</th>
<th>1st Decommissioning licence</th>
<th>End of 1st Decommissioning phase</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Start of Decommissioning – 2nd phase</th>
<th>Start of Decommissioning – 3rd phase</th>
<th>Start of Decommissioning – 4th phase</th>
<th>Start of Decommissioning – 5th phase</th>
<th>Main Production Unit – conversion into the TSÚ RAO</th>
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<tbody>
<tr>
<td>2009</td>
<td>2017</td>
<td>2021</td>
<td>2025</td>
<td>2033</td>
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</table>
NPP V1 Bohunice – Decommissioning

Operation Licence
- V1 NPP Operation termination
  - 2006

Decommissioning Licence
- Decommissioning – 1st phase
  - 2008
- Decommissioning – 2nd phase
  - 2015
  - 2025
NUCLEAR POWER PLANTS IN OPERATION

EBO Unit 3 = 505 MWe
EBO Unit 4 = 505 MWe

EMO Unit 1 = 470 MWe
EMO Unit 2 = 470 MWe
COMPLETION OF MOCHOVCE NPP (EMO 3, 4)

- Budget more than 5.4 billion EUR
- More than 150 suppliers
- More than 800 experts from Enel/SE, a.s.
- More than 3500 workers

- The largest private investment in Slovakia
- 1 of 3 NPPs under construction in Europe
- Cooperation of DE, IT, FR, and RU companies in construction
THANK YOU FOR YOUR ATTENTION