CZECH NUCLEAR DEVELOPMENT PLAN AND ITS ACCORDANCE WITH THE DECARBONISATION GOALS

NE•RS 2019
12th Annual Conference on Nuclear Energy
November 6th, 2019 – Prague, Kaiserštejnský Palace

MINISTRY OF INDUSTRY AND TRADE

René Neděla
Deputy Minister
Ministry of Industry and Trade of the Czech Republic

Objectives of the Development of the Nuclear Energy Sector in the CZ

- Support the development of the nuclear energy sector as one of the pillars of electricity generation.
- Desired target share of nuclear energy in electricity generation ranging around 50% and with the maximisation of heating from nuclear power plants.
- Support and accelerate the process of negotiation, preparation and implementation of new nuclear builds at the sites of existing NPPs with the total capacity up to 2 400MW.

Strategic Documents

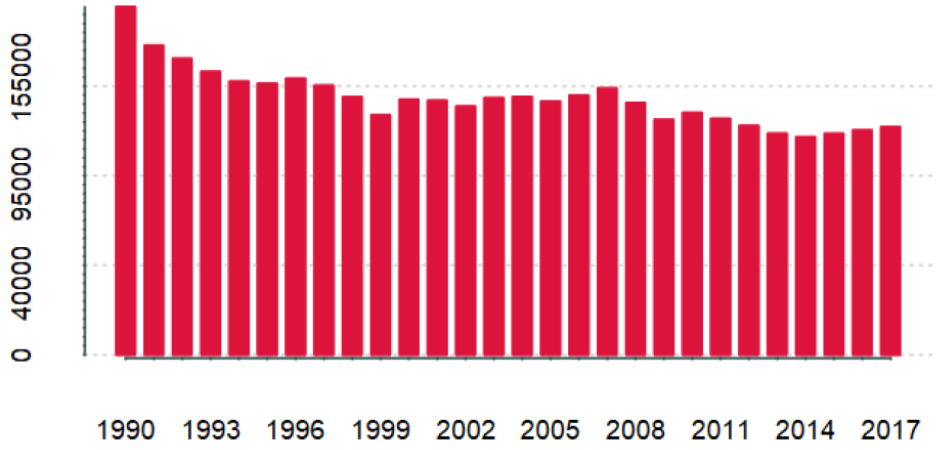
Strategic Documents are based on the recognition that the State has a vital role in the energy sector to ensure energy security, self-sufficiency and reliability of electricity supply to residents and industry.

- State Energy Policy (2015) - a main strategic document in the field of energy until 2040.
- Other important documents are the National Action Plans, e.g. for Nuclear Energy, Smart Grids (SG), RES, Clean Mobility, etc.
- Integrated National Energy and Climate Plan of the CZ.

Decarbonisation

Historic GHG reduction:

- In 2017 emissions of **GHG were 35% lower** compared to 1990.
- However, in the **last 3 years GHG emissions increased** mainly due to relatively strong economic growth.



Source: Ministry of the Environment of the Czech Republic

Draft of Integrated National Energy and Climate Plan of the CZ 1/2

- In the area of GHG emission reductions the EU target equals to 43% compared to 2005 in the sectors covered by the EU ETS and 30% in sectors outside the EU ETS.

- The main objective of the CZ is to reduce the total GHG emissions by 30% by 2030 compared to 2005, corresponding to a reduction of emissions of 44 million tonnes CO_2 eqv.

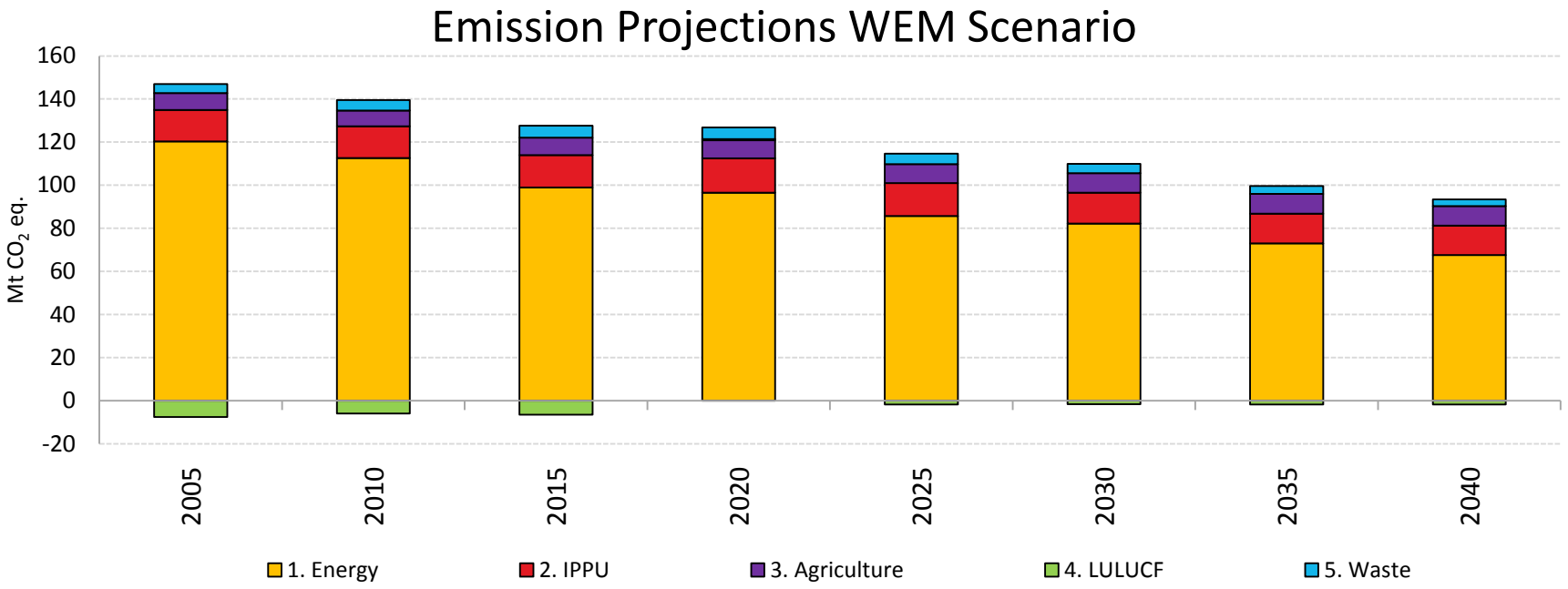
- According to the emission projections, a 34% reduction in GHG emissions (compared to 2005) in the CZ will be achieved through the implementation of the policies and measures contained in the Draft of National Plan.

Decarbonisation

GHG targets – Climate Change Policy

Timeframe of target	Description of target
Main target by 2020	To reduce emissions by 2020 by at least **32Mt CO_2 eq in comparison with 2005** (app. 20%).
Main target by 2030	To reduce emissions by 2030 by at least **44Mt CO_2 eq in comparison with 2005** (app. 30%).
Indicative target by 2040	To pursue the **indicative level of 70Mt CO_2 eq** of emissions in 2040.
Indicative target by 2050	To pursue the **indicative level of 39Mt CO_2 eq** of emissions in 2050 (80% emissions reduction compared to 1990).

Decarbonisation



Source: Ministry of the Environment of the Czech Republic

Draft of Integrated National Energy and Climate Plan of the Czech Republic 2/2

- The dimension of decarbonisation also includes the area of RES. The EU agreed on the level of 32% by 2030, expressed as a share of RES in final gross energy consumption.

- The CZ proposed a 20.8% (currently revised to potentially 22%) contribution to the European target by the year 2030. This is an increase of 9% compared to the national target of the CZ of 13% set for the year 2020.

Draft of Integrated National Energy and Climate Plan of the CZ

- With regard to the internal energy market dimension, there is a main target of 15% for electricity interconnectivity for the year 2030. The CZ aims at maintaining the import and export capacity of the transmission system for the year 2030.

- The CZ's interconnectivity hits almost 30%, thus does not consider necessary to introduce further specific policies in this area.

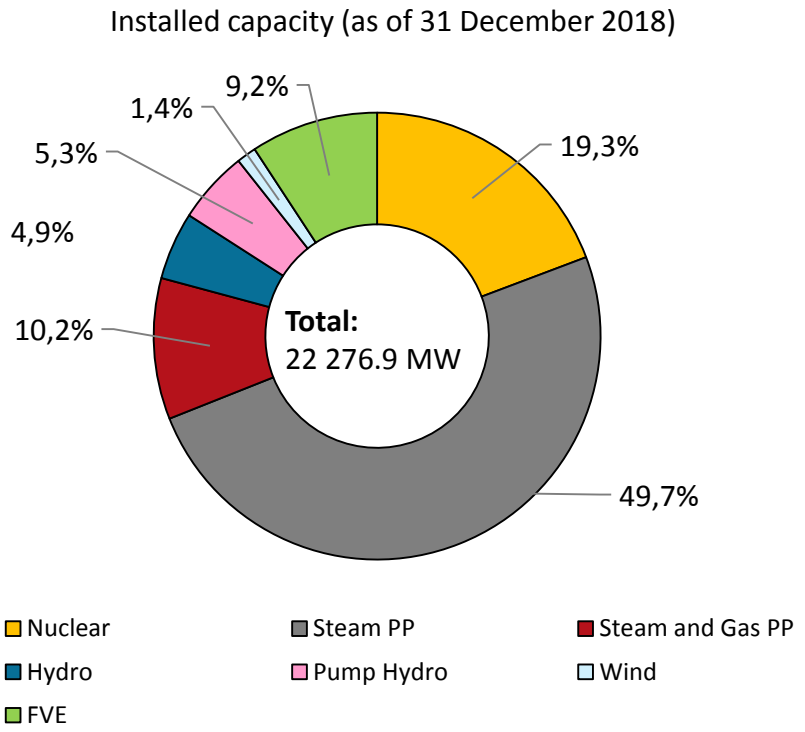
René Neděla
Deputy Minister
Ministry of Industry and Trade of the Czech Republic

Role of a Nuclear Energy

- Low-carbon baseload source of electricity (significant reduction of CO_2 emissions).
- Long-term, safe, stable and reliable power source.
- Safety guaranteed under current international and national laws and agreements.
- Increases the industrial production and its export potential.
- Knowledge base of the economy - the leader of high-tech and R&D.

René Neděla
Deputy Minister
Ministry of Industry and Trade of the Czech Republic

Energy mix (electricity)

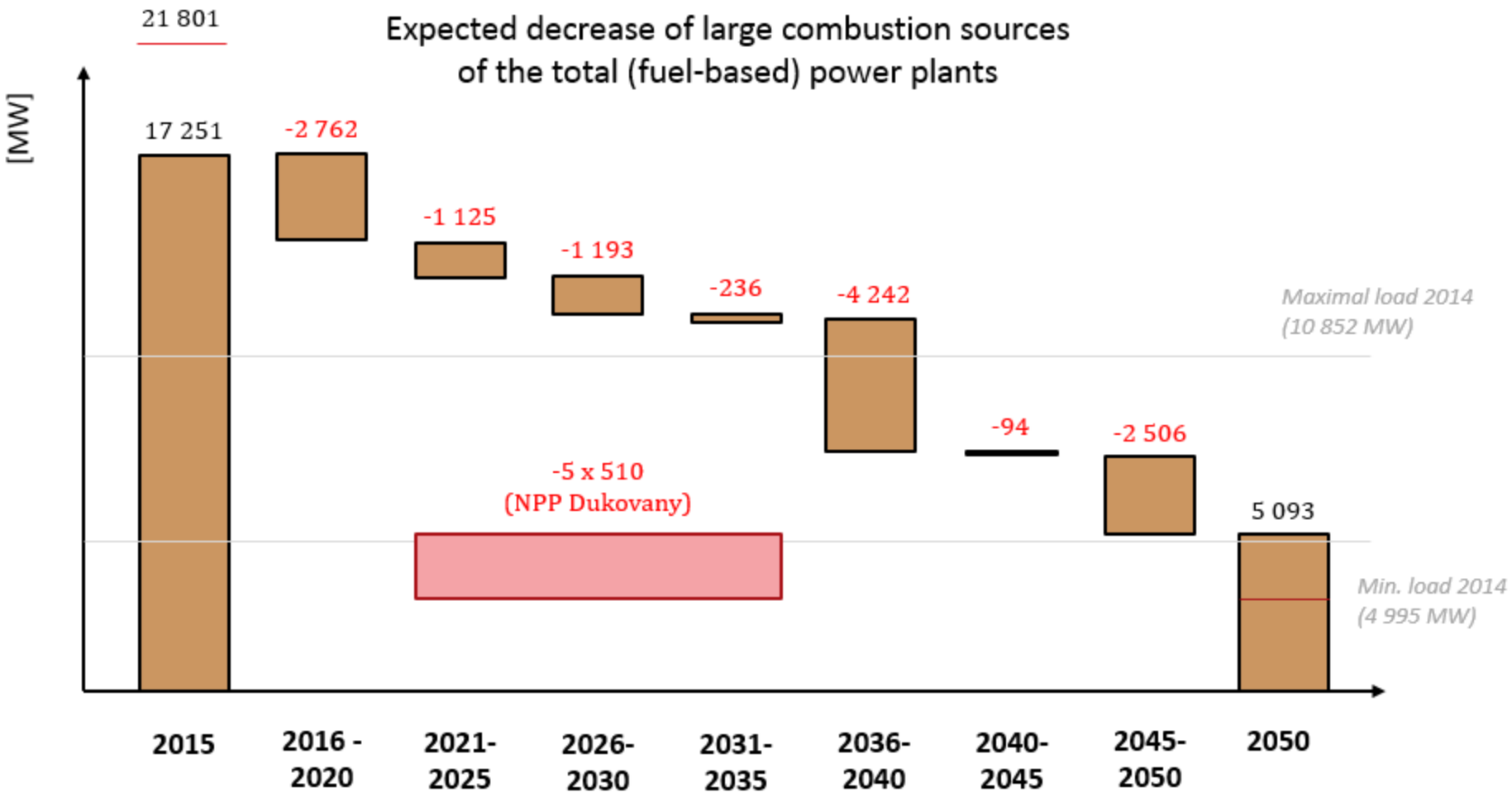


Source: Energy Regulatory Office (2018 report)

Installed capacity (as of 31st December 2018) in MW:

- Steam PP: 11 075.4 (49.7%)
- Nuclear: 4 290.0 (19.3%)
- Steam and Gas PP: 2 274.4 (10.2%)
- FVE: 2 056.8 (9.2%)
- Hydro: 1 092.5 (4.9%)
- Pump Hydro: 1 171.5 (5.3%)
- Wind: 316.2 (1.4%)
- **Total: 22 276.9 (100.0%)**

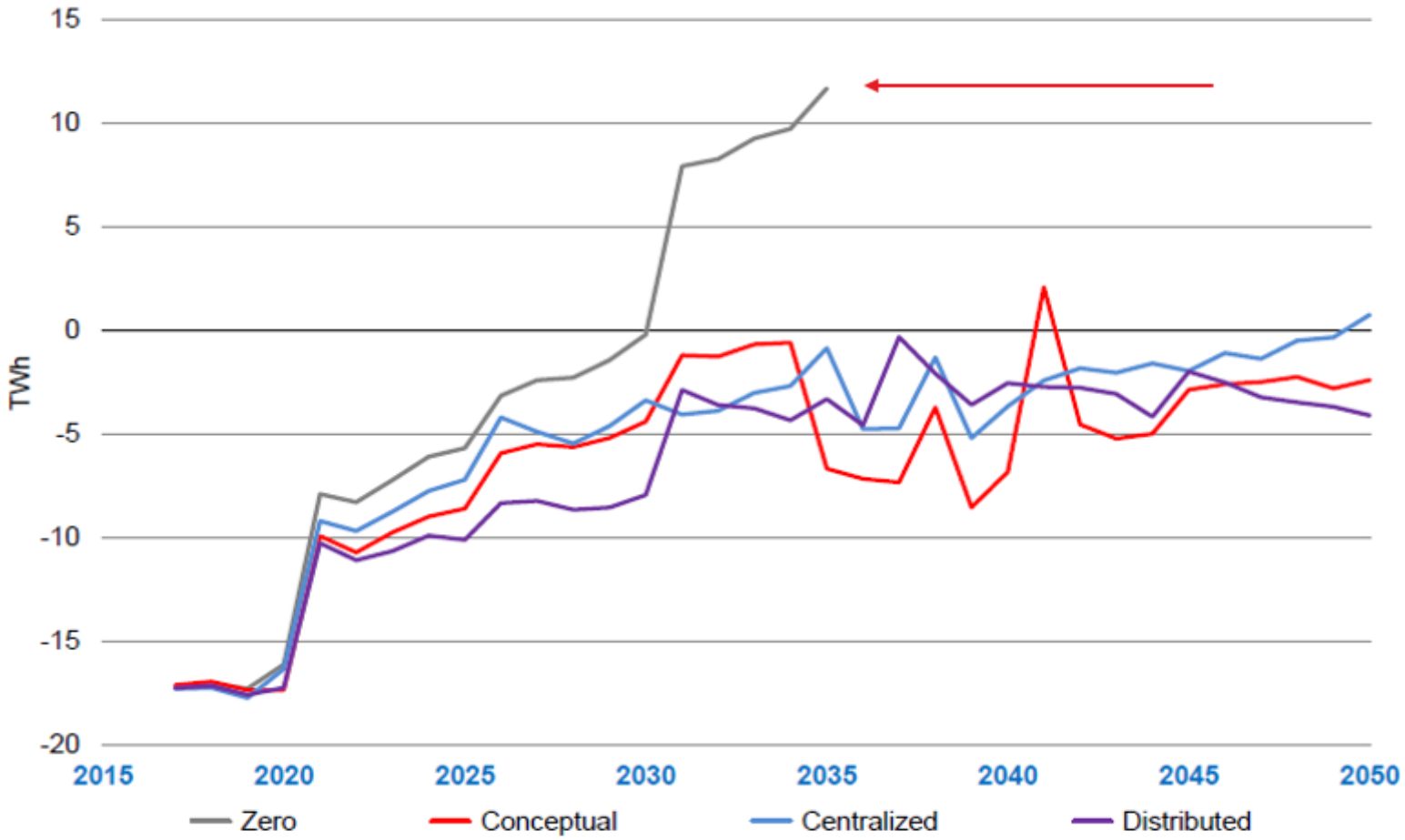
Czech Republic - Actual status



Source: Ministry of Industry and Trade of the Czech Republic

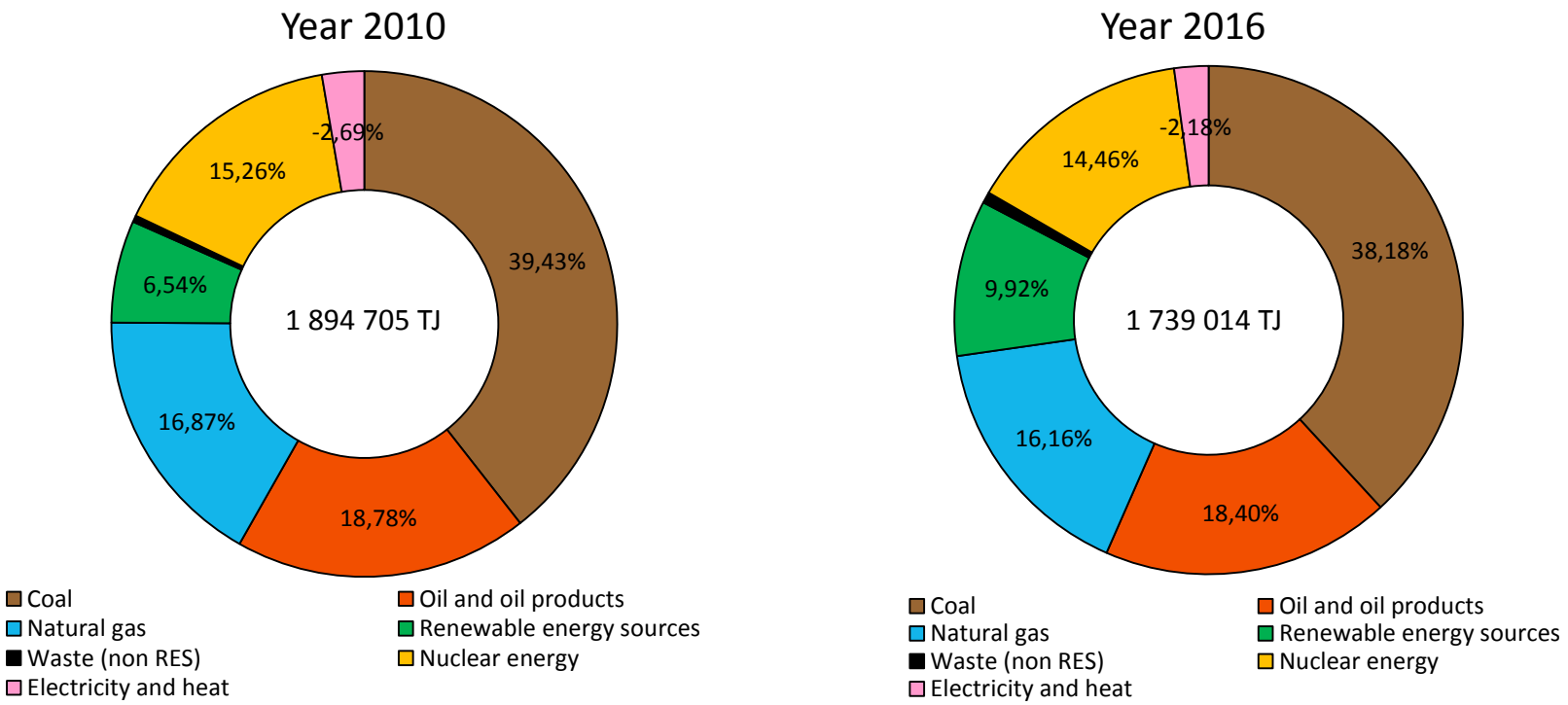
The CZ - Current status

Balance of electricity trading (import, export)



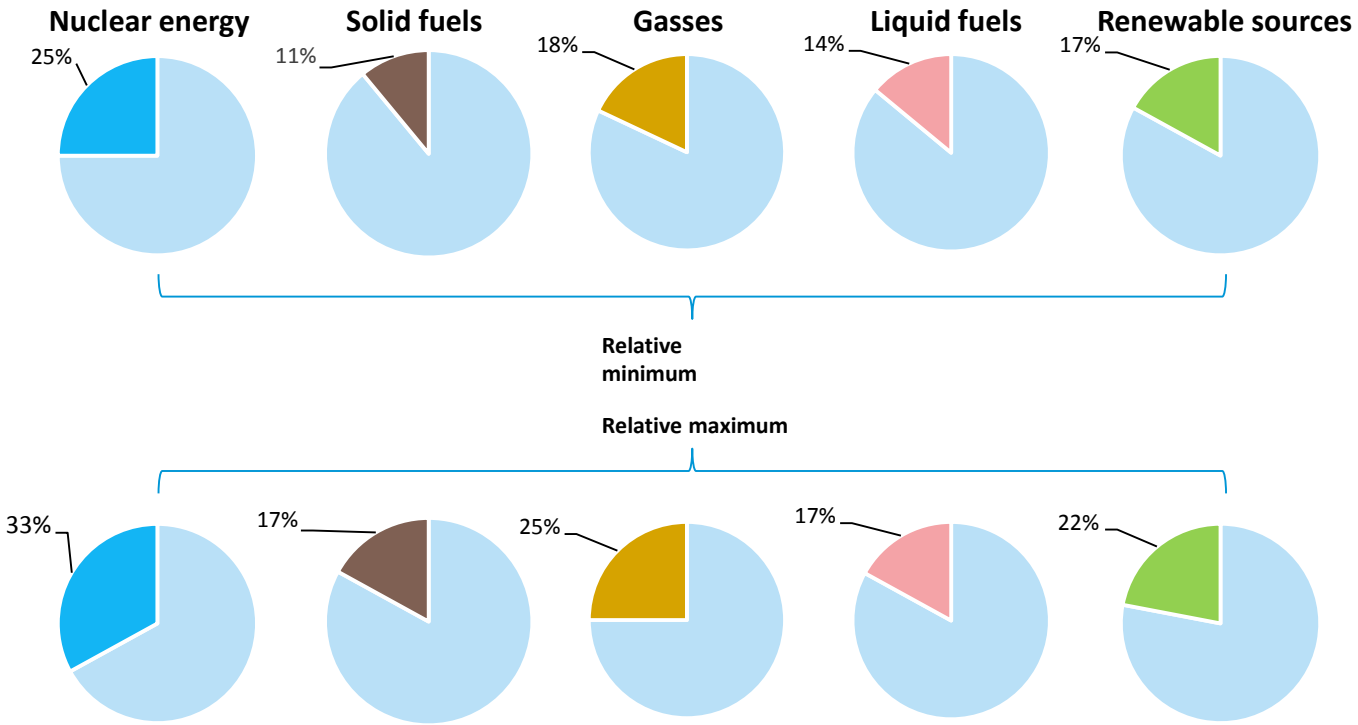
Source: Czech electricity and gas market operator, (OTE)

Energy mix (primary energy sources)



Source: Ministry of Idustry and Trade of the Czech Republic

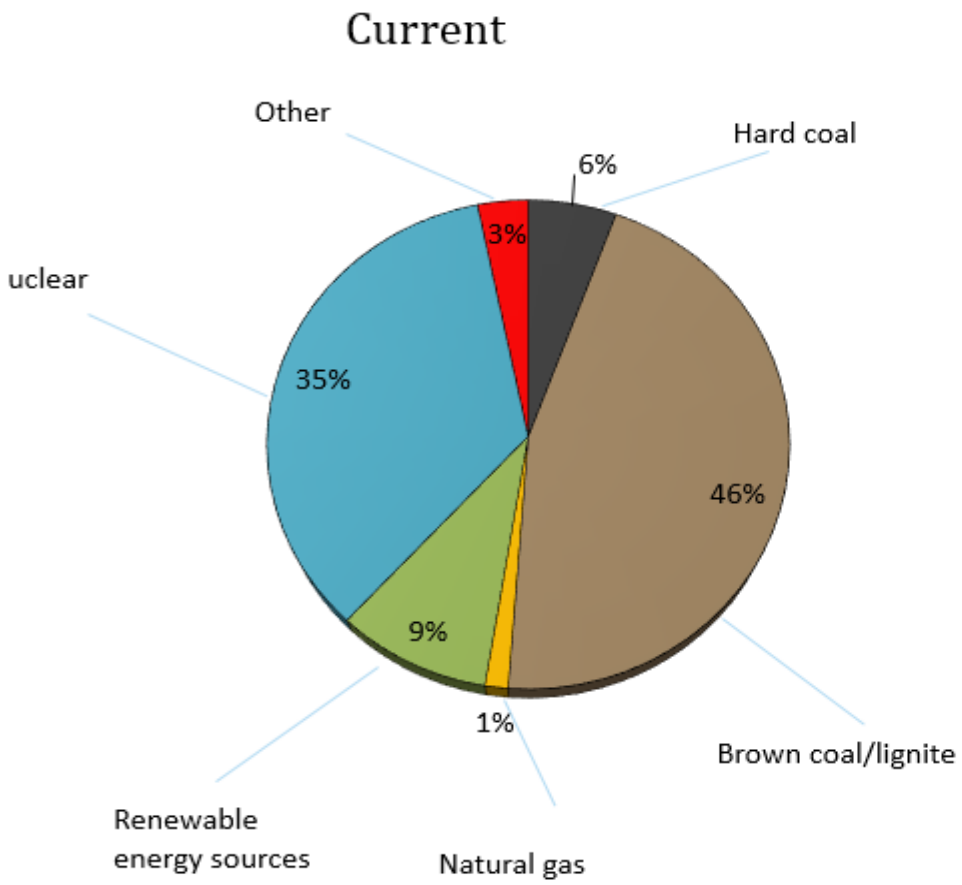
Diversification of PES (2040)

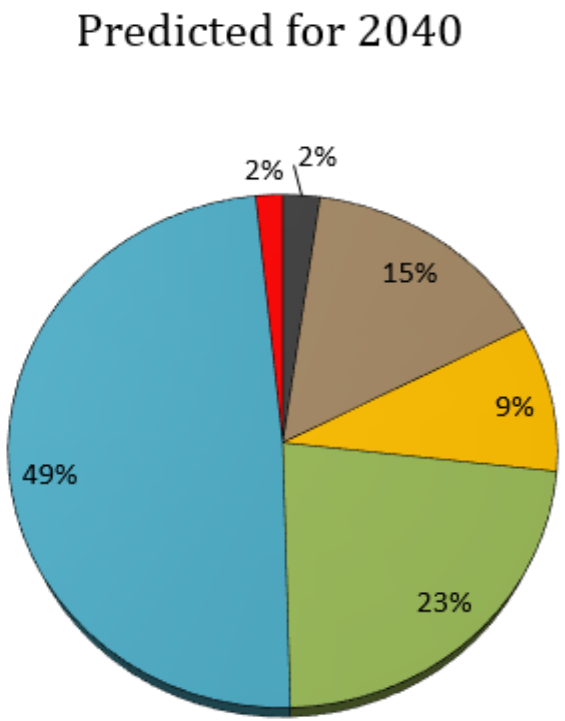


Source: Ministry of Industry and Trade of the Czech Republic

The CZ – Current status

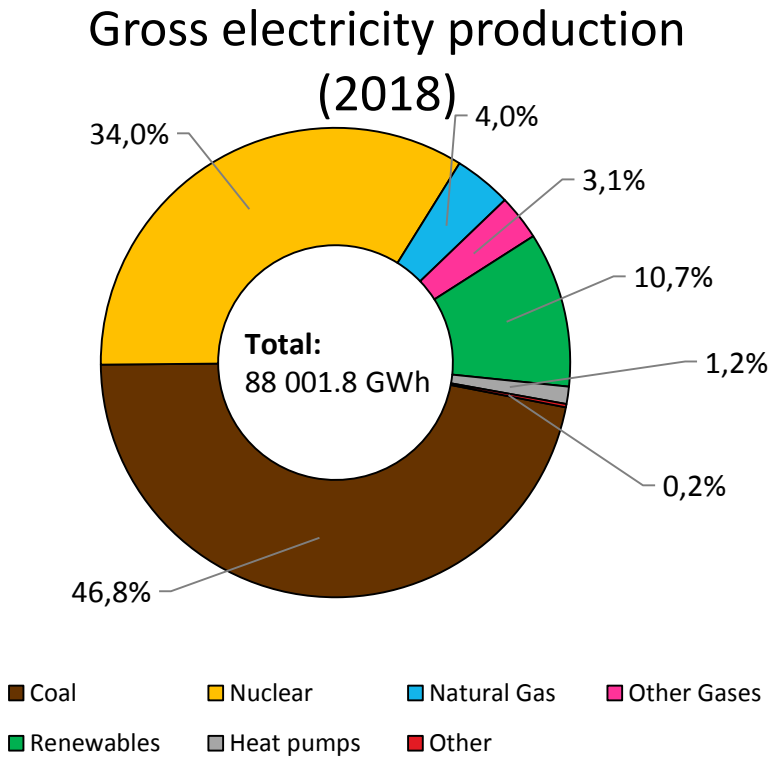
Gross electricity production





Source: Ministry of Industry and Trade of the Czech Republic

Energy mix (electricity)

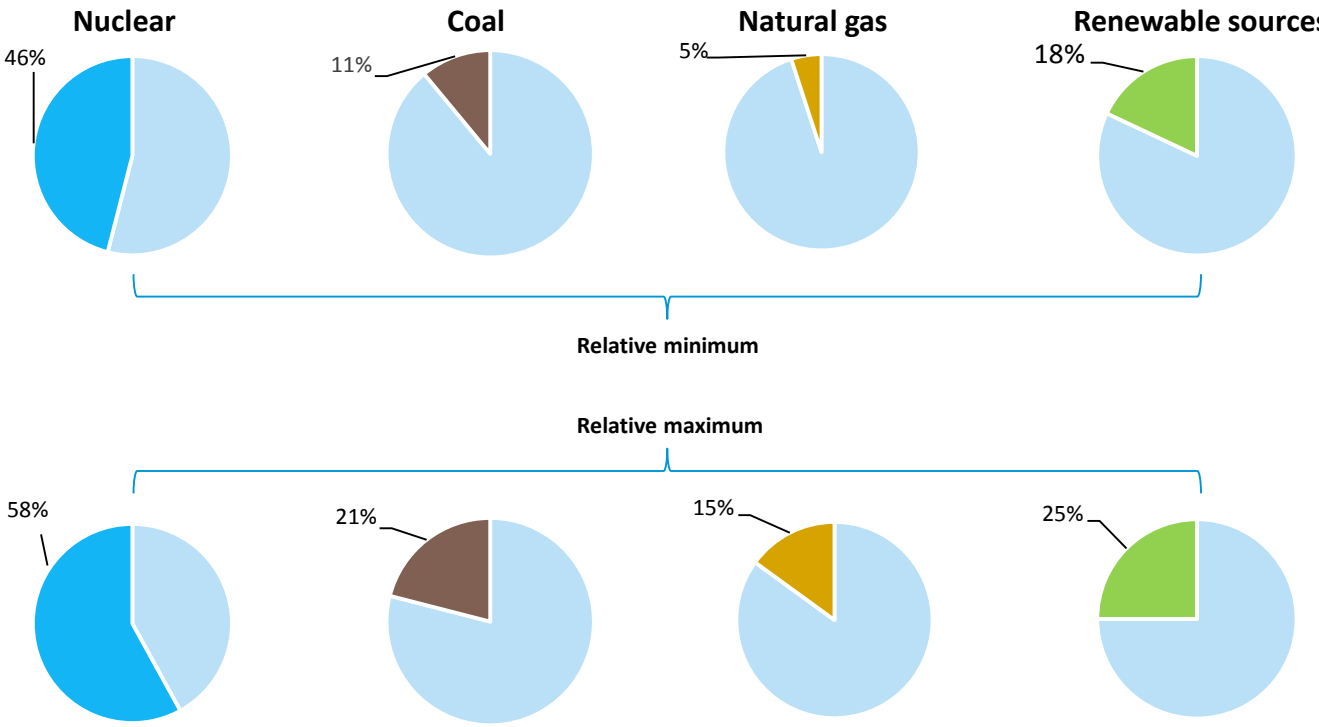


Gross electricity production (2018) in GWh:

- Coal: 41 188.3 (46.8%)
- Nuclear 29 921.3 (34.0%)
- RES: 9 403.9 (10.7%)
- H. pumps: 1 050.6 (1.2%)
- Other: 198.0 (0.2%)
- **Total 88 001.7 (100.0%)**

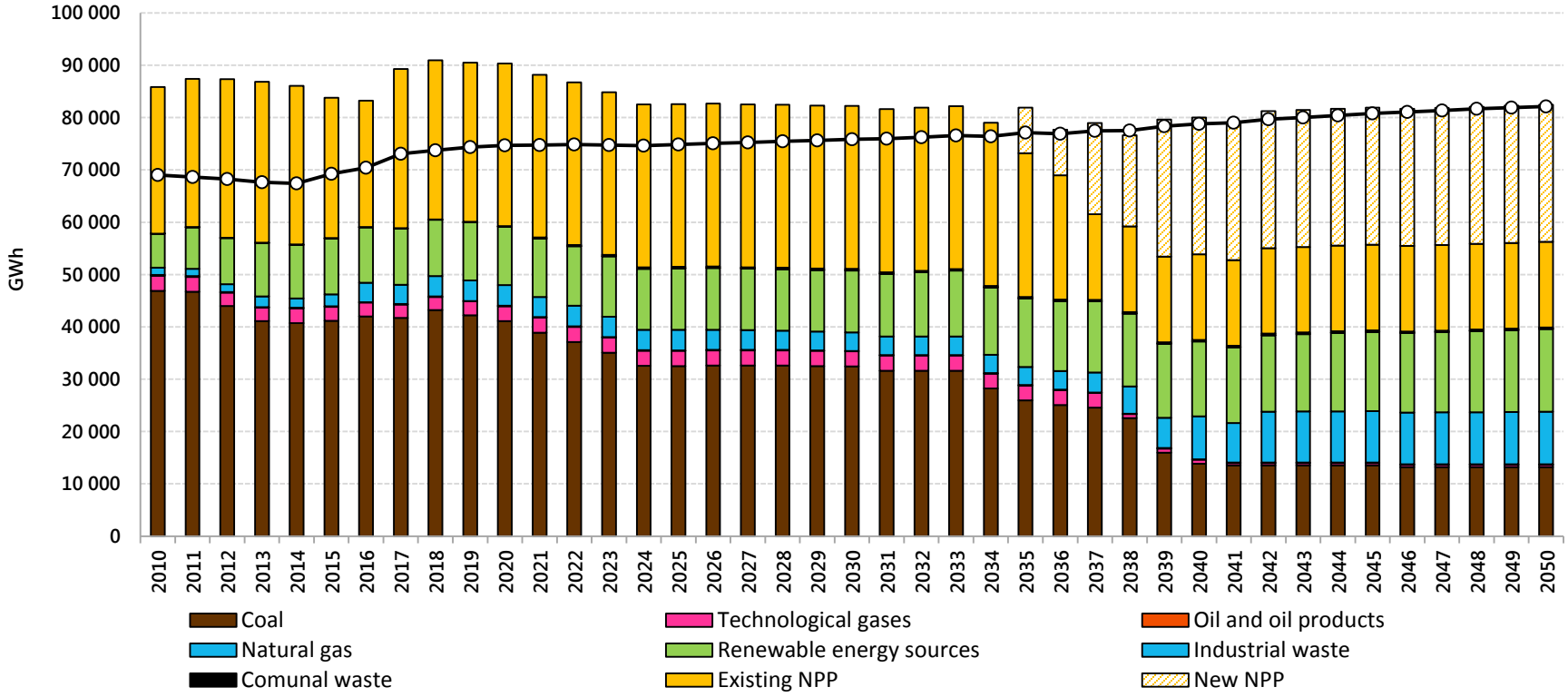
Source: Energy Regulatory Office (2018 report)

Diversification of electricity prod. (2040)



Source: Ministry of Industry and Trade of the Czech Republic

Forecast of electricity production and consumption

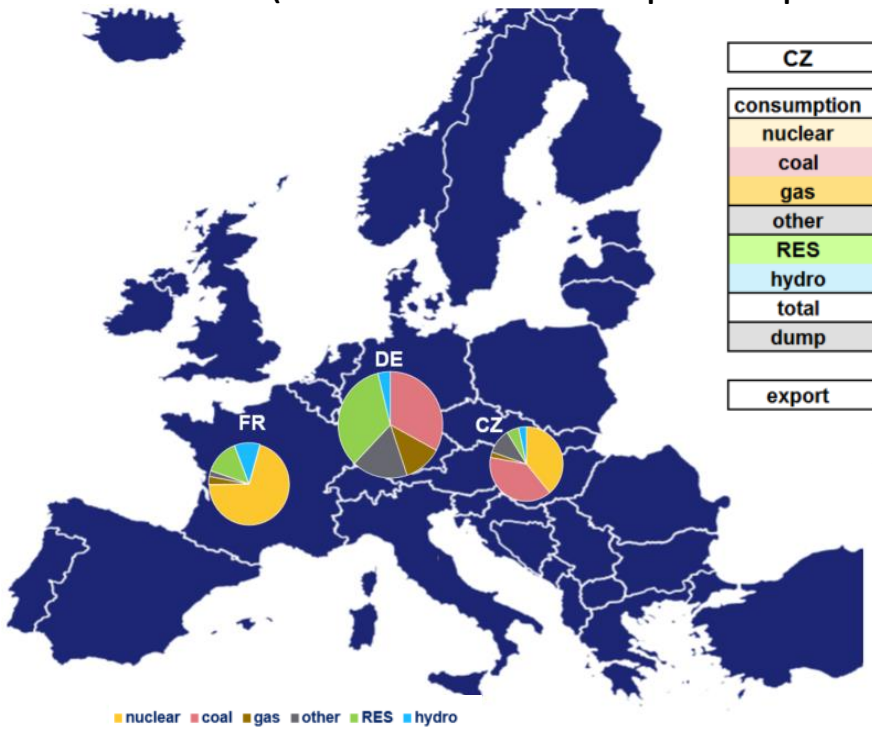


Source: Based on the draft NCEP of CZ

Generation adequacy in 2025 (scenario according to MAF 2018)

Electricity prod. and cons. balance in the CZ, GER and FR in 2025

(scenario with coal power plants in operation - MAF 2018)



CZ	TWh
consumption	73,5
nuclear	29,9
coal	29,7
gas	1,8
other	8,3
RES	4,2
hydro	2,7
total	76,5
dump	0,0
export	3,0

DE	TWh
consumption	554,0
nuclear	0,0
coal	180,9
gas	65,4
other	94,8
RES	187,0
hydro	21,1
total	549,2
dump	1,2
import	-4,7

FR	TWh
consumption	482,1
nuclear	402,0
coal	0,0
gas	18,2
other	12,8
RES	79,9
hydro	58,8
total	571,7
dump	0,0
export	89,6

Risk of ensuring balance in DE (LOLE > 3h]

Source: ČEPS – TSO of the Czech Republic

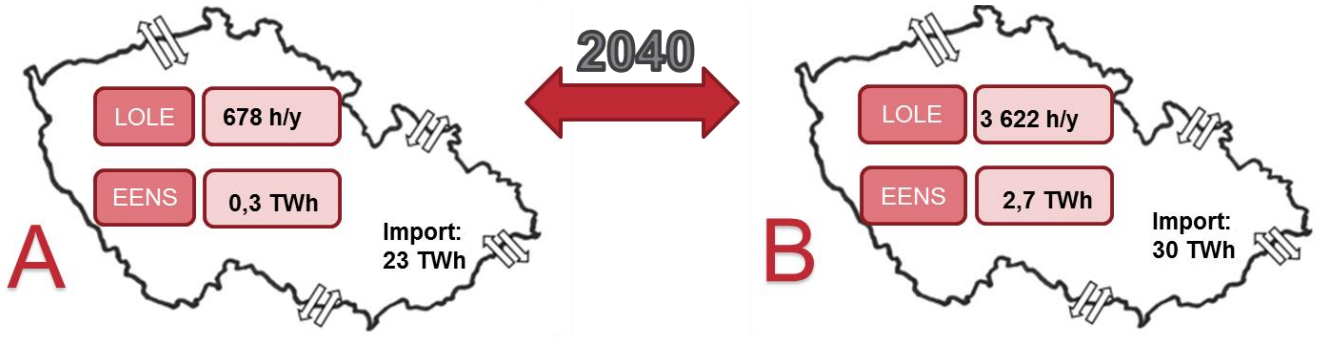
Additional information:

- Within the next 5-7 years, there will be a real risk of missing capacity in CZ and DE, even in case of consideration of the base case
- The reason is the massive phase-out of coal resources due to the BAT/BREF requirements
- The risk is increasing with more strict emission constrains for the operation of plants
- The need for flexibility is indicated (in units of TWh) – dump energy, the necessity for accumulation
- Implementation of the strategic reserves and capacity mechanisms

MAF (2019) CZ results for 2040 for base case scenario (A) and low-carbon scenario (B)

- Analysis of the Czech energy self-sufficiency
  - Without new generation capacities it is not possible to ensure the energy self-sufficiency of the Czech Republic
  - Significant dependence on electricity imports
  - The Czech Republic is not secured even when is importing electricity

- According to scenario B, the not-supplied energy up to 2,7 TWh per year can be expected, what can lead to the consumption-related regulation during 3 622 hours per year
  - As a result, there will be electricity deficit up to 753 MW of average hourly output (what corresponds to the consumption of an agglomeration of approximately 0,7 to 1 million inhabitants)



Dukovany II - Current Status 1/3

- **The Government Resolution No. 485 from July 8th , 2019 selected option 4.2 “Contract” of the investor model for the construction of a new nuclear build.**
  - Construction will be carried out through a 100% subsidiary of ČEZ with certain guarantees from the State. The relationship between the State and ČEZ will be governed by a contract for this specific project.
  - The contracts between the State and ČEZ:
    - Will define State support that will enable ČEZ to obtain a loan for construction on favorable terms.
    - Will deal with the situations related to a possible change in the legislative and regulatory environment.
    - Will allow the State to control the construction process and define the rights and obligations of both parties, including the possible takeover of the investment company by the State.
  - The investment effort will be concentrated in the construction of 1 or 2 units at Dukovany II site, each having installed capacity up to 1.200MW.

Dukovany II - Current Status 2/3

- **Negotiations with EU authorities will take place at the end of November 2019.**
  - Formal negotiations on the chosen investor model and compliance with the rules of the EU internal market will be led by Special Envoy for Nuclear Energy, Jaroslav Míl.
  - The EC is aware of the political sensitivity of nuclear energy and the different views of MS.
  - EU considers RES and Nuclear Energy to be the 'backbone of carbon-free electricity production' within the framework of the EU's decarbonisation strategy.

Dukovany II - Current Status 3/3

- August 2019 - the Ministry of the Environment granted the EIA for the Dukovany II.
- As part of the legal arrangement between the State and ČEZ, the Framework agreement and Implementation contract being prepared.

- **Tasks in the process of preparation in 2020**
  - Supply and Business model

    Full understanding of the supplier and business model is a vital step for the preparation of documentation for the technology vendor tender.
  - Licensing processes according to Czech legislation.
  - Notification process with the EC.

Temelín project - Current Status

Still there is a discussion on the further development of Nuclear Energy in the CZ. The other site - Temelín - is now in the following state:

- **Environmental impact assessment (EIA)**
  - Positive Statement issued in January 2013
  - Conditions to be fulfilled in site permit process
  - Valid for 5 years (until 2018) with possibility of an extension for next 5 years
  - ČEZ has applied for 'verification statement' – issued in May 2016
- **Nuclear sitting permit**
  - Issued in October 2014 for ČEZ, a. s.
  - Enterprise Elektrárna Temelín II has to apply for new permits
  - Conditions to be fulfilled in site permit process
- **Separate subsidiary company established**
  - Special Purpose Vehicle (SPV) Elektrárna Temelín II was officially established on October 1st, 2016

Gov. resolution 485/2019 (of 8th of July) charged relevant state authorities to manage activities on the site of NPP Temelín in a way that will enable fast activation on an as-needed basis.

Thank you for your attention

MINISTRY OF
INDUSTRY AND TRADE

René Neděla
Deputy Minister
Ministry of Industry and Trade of the Czech Republic