

NE-RS 2017

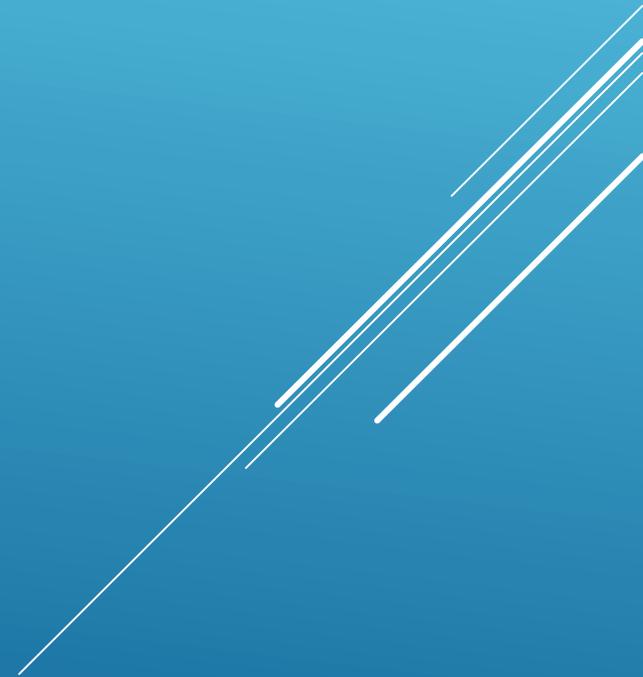
10TH CONFERENCE ON NUCLEAR ENERGY

PRAHA, 8 NOVEMBER 2017

STATE OF THE PREPARATORY ACTIVITIES RELATED TO NEW NPPS IN THE CZECH REPUBLIC
(WHAT HAS BEEN PREPARED AND WHAT'S LEFT FOR THE NEW GOVERNMENT)

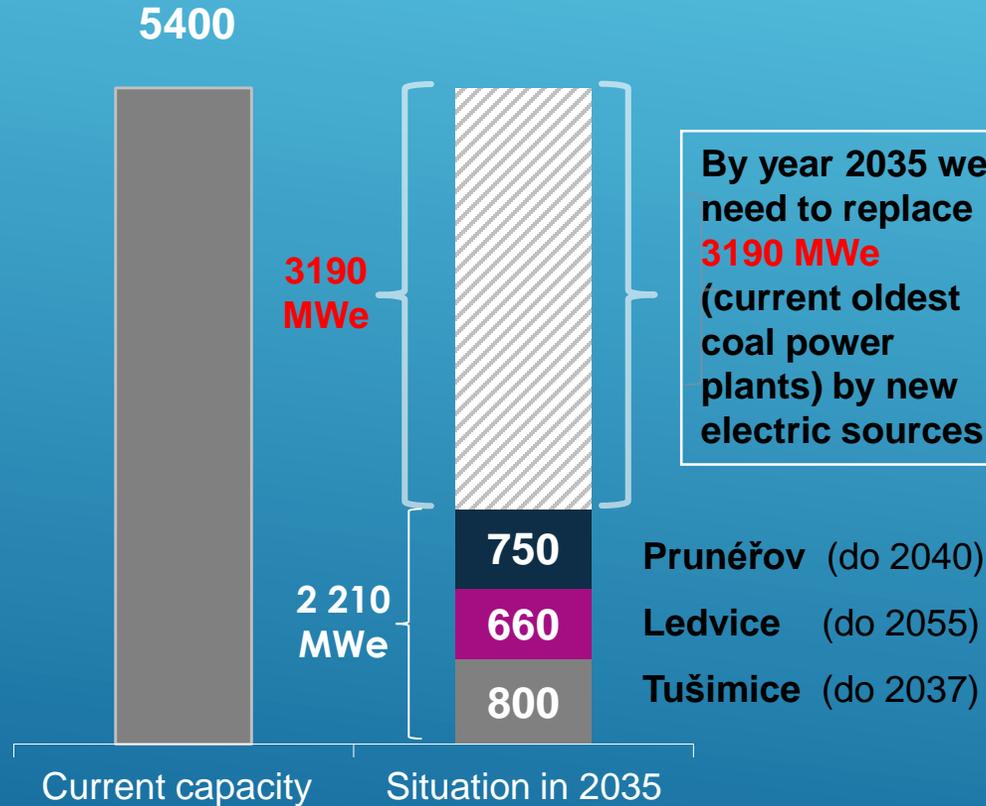
Presented by Ján Štuller, State commissioner for nuclear energy

WHAT IS THE PROBLEM?



NAP NE: IN NEXT TWO DECADES WE SHOULD EXPECT WITH HIGH PROBABILITY CONSIDERABLE DECREASE OF ELECTRICITY GENERATION IN COAL POWER PLANTS

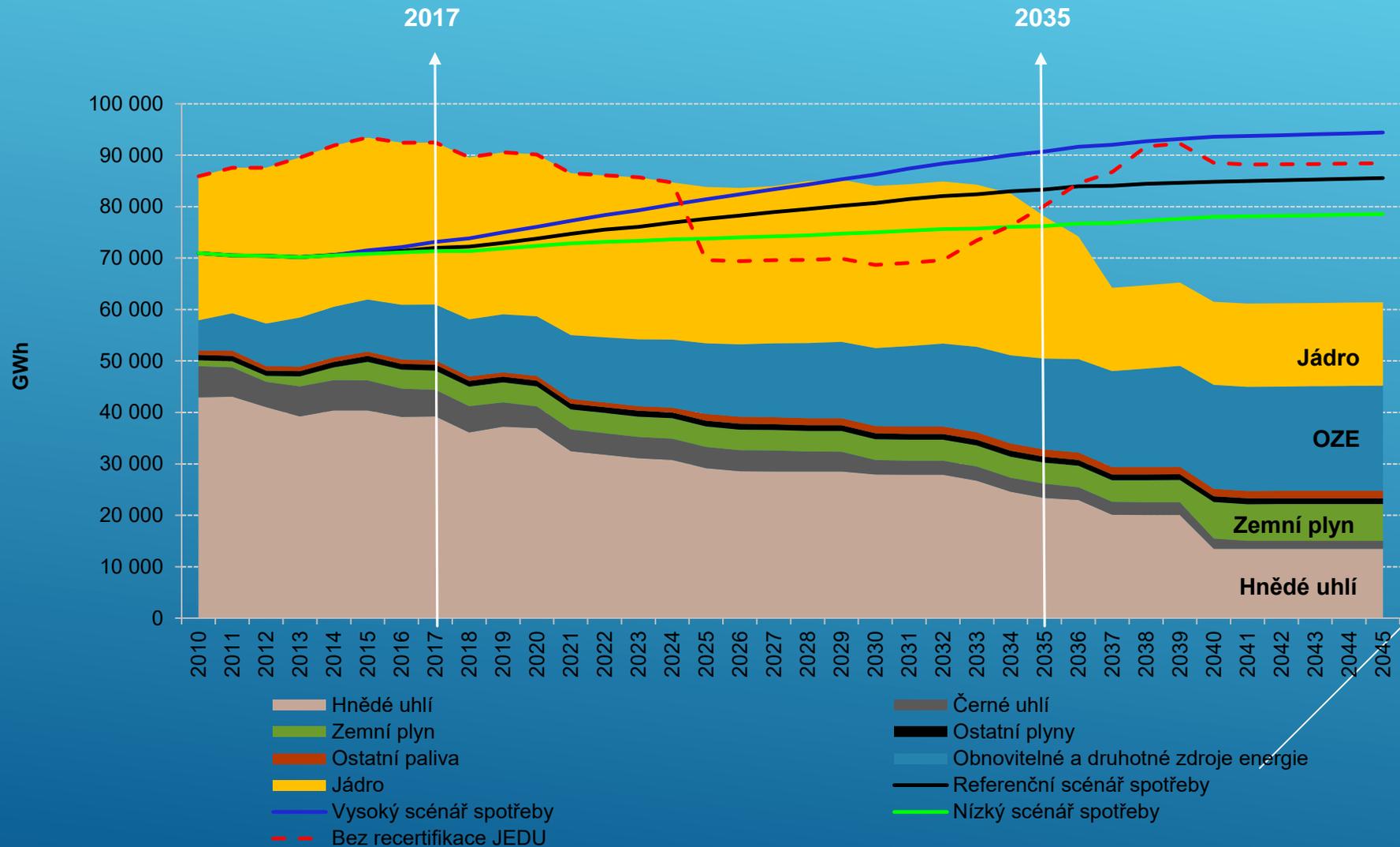
Current capacity of ČEZ coal power plants [MWe]



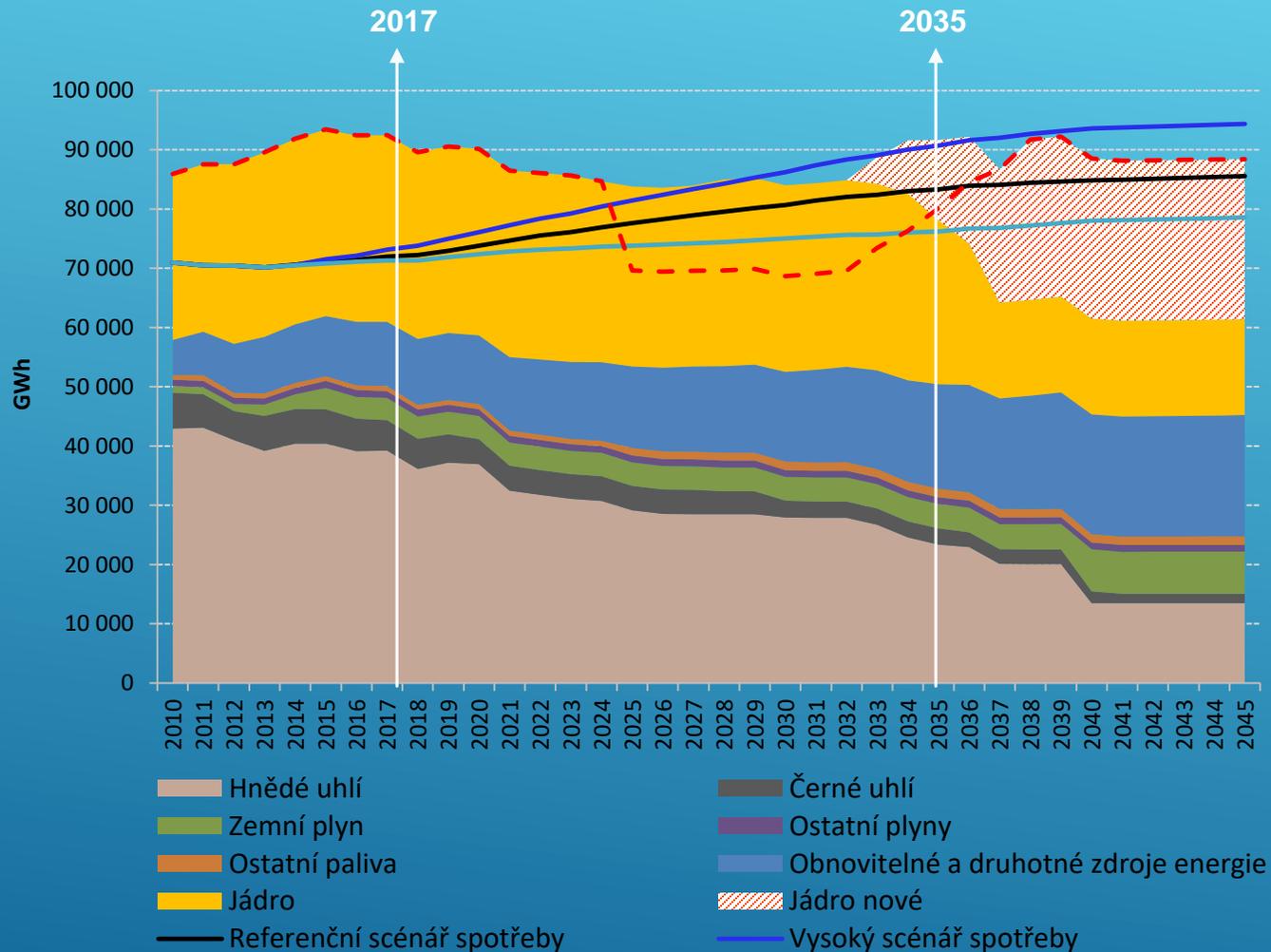
- After 2030 the availability of electric production capacity will be decreasing dramatically.
- By 2040 the whole portfolio of brown coal power plants (except Ledvice power plant - 660 MW) will have to be replaced by new sources.

Furthermore, by 2035-2037 additional new sources will be needed to replace 4 units at Dukovany NPP. **(2000 MWe).**

NAP NE – HIGH RISK OF ELECTRICITY DEFICIT IN 2035 (OR EVEN SOONER) IF NO NEW SOURCES ARE BUILT AND PUT IN OPERATION BY THAT TIME

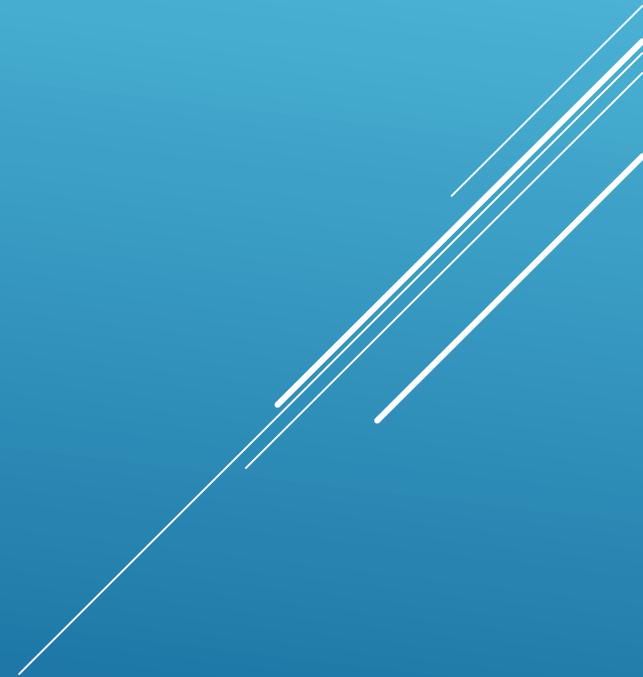


SEK / NAP NE



- ▶ The surplus of energy sources will be eliminated due to decrease of coal mining, environment protection restrictions and the end of lifetime of the Dukovany NPP.
- ▶ The cut in energy sources will not be possible to compensate by increasing the efficiency or energy savings or by using renewables only → the only options for compensating the lack of energy sources will be the nuclear (alternatively natural gas) if no new and more efficient technologies are found.
- ▶ The use of natural gas has well know shortcomings (lower energy security, higher operational costs, price fluctuations and production of CO₂).
- ▶ Therefore, the only choice is energy mix including nuclear energy.

WHAT WE PLAN TO DO?



NATIONAL ACTION PLAN FOR NUCLEAR ENERGY DEVELOPMENT (NAP NE)

In June 2015 the State energy strategy and the NAP NE were approved by the Government and adopted for immediate implementation.

NAP NE is based on:

- Risk analysis: high risk of electricity deficit after 2035 (or even sooner) if no new electric power sources are built.
- Strategic objective: energy security based on own reliable and modern sources (safe, reliable, stable, efficient, environment friendly) acceptable for the public.
- More than 30 years of experiences with NPPs being the backbone of the domestic electric power generation
- Limited conditions for renewables: full self-sufficiency in electricity production based solely on renewables is unrealistic 😞

NAP NE and new NPPs

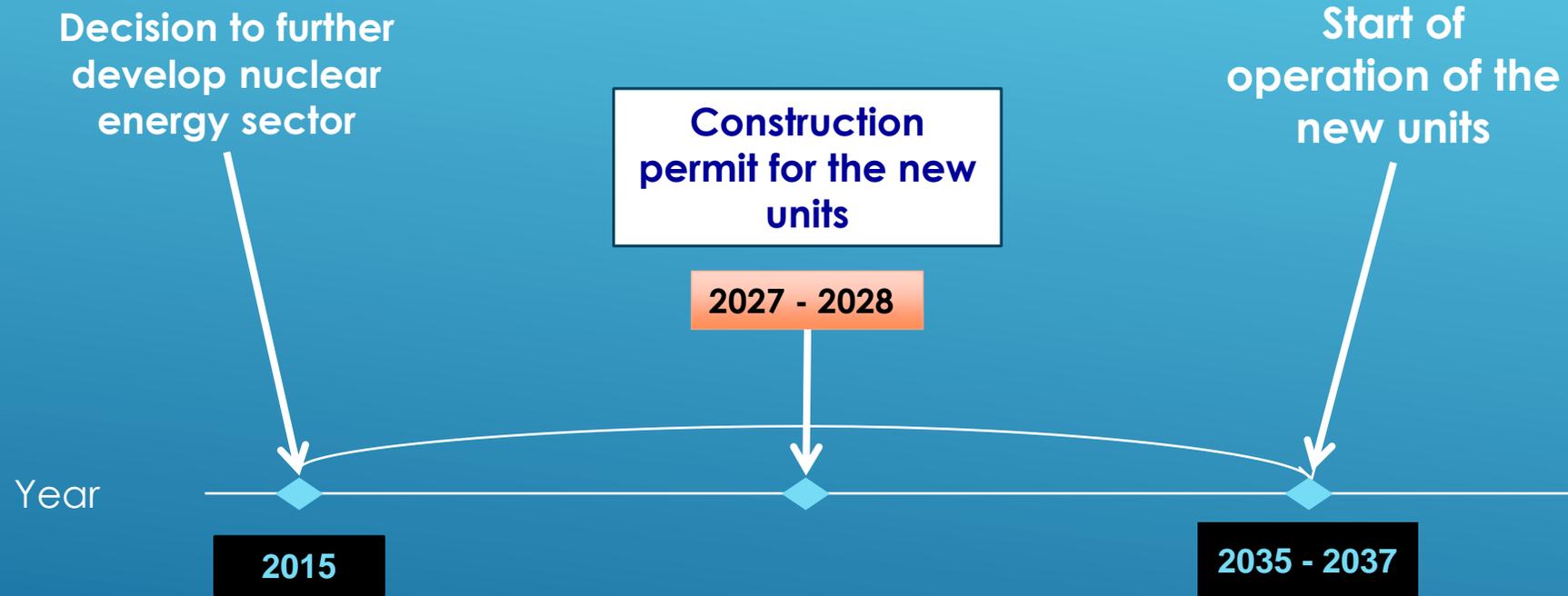
NAP NE focuses on:

- Strengthening the role of nuclear energy in electricity generation mix; by 2035-2037 replace the oldest units of Dukovany NPP and partially compensate the decreasing production in fossile (coal) power plants => **electricity production in nuclear should increase to up to 50% of the gross electricity generation.**

- Accelerating preparatory activities related to the construction of new nuclear units at existing sites at Dukovany and Temelín with the objective of:
 - **installing new capacity of up to 2 500 MW** (respectively with the annual production of around 20 TWh) **by 2034-2035 (2035-2037)**
 - **giving priority to Dukovany site** (so as to compensate on time possible shutdown of Dukovany NPP in 2035-2037).

- Maintaining safe continued operation of Dukovany NPP and Temelín NPP up to 50 (or 60) years of operation ●

NAP NE – installing new capacity of up to 2 500 MWe by 2034-2035 (2035-2037 ?)



NAP NE and new NPPs

NAP NE envisages following steps and activities to be completed:

before 2025:

- ▶ Decision by the Government on Investment model and financing model (~~2016-2017~~-**2018**)
- ▶ Complete the EIA process for EDU 5,6
- ▶ Selection of the NPP supplier
- ▶ Starting the site licensing and construction licensing processes
- ▶ Issue of site and construction licenses for two units at each site

----- HOLD POINT -----

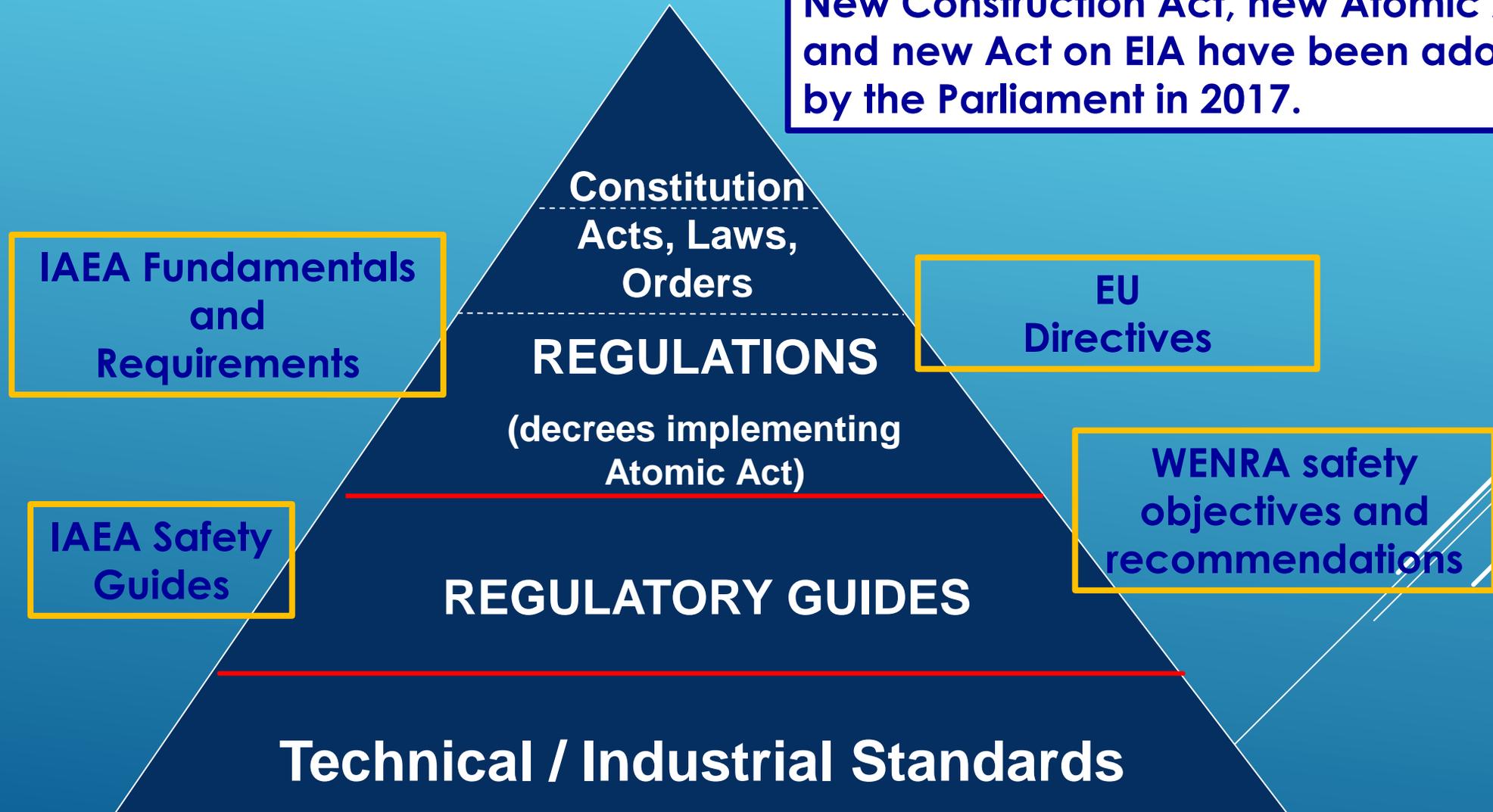
after 2025: construction of one to four new units depending on electricity needs and electric power of the new units 🇸🇪

**WHAT HAVE WE DONE SO FAR IN PREPARING
CONSTRUCTION OF NEW NPPs?**



LEGISLATION AND REGULATORY REQUIREMENTS FRAMEWORK

New Construction Act, new Atomic Act and new Act on EIA have been adopted by the Parliament in 2017.



IMPLEMENTATION OF THE NAP NE

Tasks at the Government level:

- ❑ To establish The Standing Nuclear Committee to oversee further preparation and implementation of policy measures, to oversee implementation of the NAP NE and to bring to the attention of the Government issues which require Cabinet attention and action - done in January 2016.
- ❑ To establish expert Working Groups to support the Standing Nuclear Committee (to carry out analytical activities and prepare proposals for implementing the NAP NE) - done, three expert working groups established and approved by the Cabinet in January 2017.
- ❑ To appoint the State Commissioner for nuclear energy (Special Envoy for Nuclear Energy) to monitor the implementation of the NAP NE, inform at early stage the Standing committee and cabinet members on discrepancies and obstacles and propose remedial measures - done in June 2016. 🚫

IMPLEMENTATION OF THE NAP NE

Government - Ministry of Industry and Trade (MTI):

- To start communication and interact with possible suppliers and partners
 - In July 2016 the MIT approached to 10 companies (potential suppliers of the new NPPs) with a Request for Information (RFI). Six companies responded positively and sent to the Ministry requested generic information related to investment, financial and technical topics.
 - This was not a start of a selection process! Obtained information helped the Czech side to consolidate its understanding of the situation in nuclear sector and helped expert groups to prepare optimal investment and financing models.

The list of 10 companies approached by the MIT

Potential Supplier	Country	Reactor type	Power	IP obtained
Westinghouse	USA	AP 1000	1200 MW	✓
Rosatom	Russia	MIR TOI	1200 MW 1250 MW	✓
Kepeco /KHNP	Korea	APR 1400 APR 1000+	1400 MW 1100 MW	✓
Areva	France	EPR 1700	1700 MW	✓
Mitsubishi	Japan	APWR 1700	1700 MW	✗
ATMEA	France / Japan	ATMEA 1100	1100 MW	✓
CGN	China	HPR 1000	1150 MW	✓
CNNC	China	ACP 1000 (HPR 1000)	1150 MW	✗
SNPTC	China	CAP 1400	1400 MW	✗

The list of 6 companies which answered and sent relevant Information Packages to the MIT

Company	Type/Technology
ATMEA	ATMEA1
EDF	EPR
China General Nuclear Power Corporation (CGN)	1000 MWe
KHNP (+KEPCO)	APR1400
	APR1000+
ROSATOM	MIR 1200
WESTINGHOUSE ELECTRIC COMPANY	AP1000

IMPLEMENTATION OF THE NAP NE

Government: Decision on investment and financing model - NOT TAKEN YET

Three possible investment models are discussed in the NAP NE:

- I. Investment by the current operator and holder of the relevant assets - ČEZ, a. s./or SPV, (construction costs covered by ČEZ, a. s. or by its 100% owned SPV, co-financing by the supplier possible);
- II. *Investment by a consortium of investors, consortium could consist of several investment partners including NPP supplier and ČEZ Group;*
- III. Investment by the state 😊

IMPLEMENTATION OF THE NAP NE

ČEZ Group: preparatory activities (I)

Task No.	Description of the task	Deadline	Status
1	To continue preparing the project with alternatives at Temelín and Dukovany sites	continuously	Implemented as planned
2	To create two SPVs	12/2016	Implemented 10/2016, EDU II and ETE II 100% owned by ČEZ, a.s.
3	To maintain necessary capabilities for implementing NAP NE and build up competencies of the project team.	06/2016	Implemented within the deadline, the team consolidated and stabilized

SITES FOR NEW NPPs



Dukovany

- Construction of Unit 5 and 6
- Pressurized Water Reactor (PWR)



Temelín

- Construction of Units 3 and 4
- Pressurized Water Reactor (PWR)



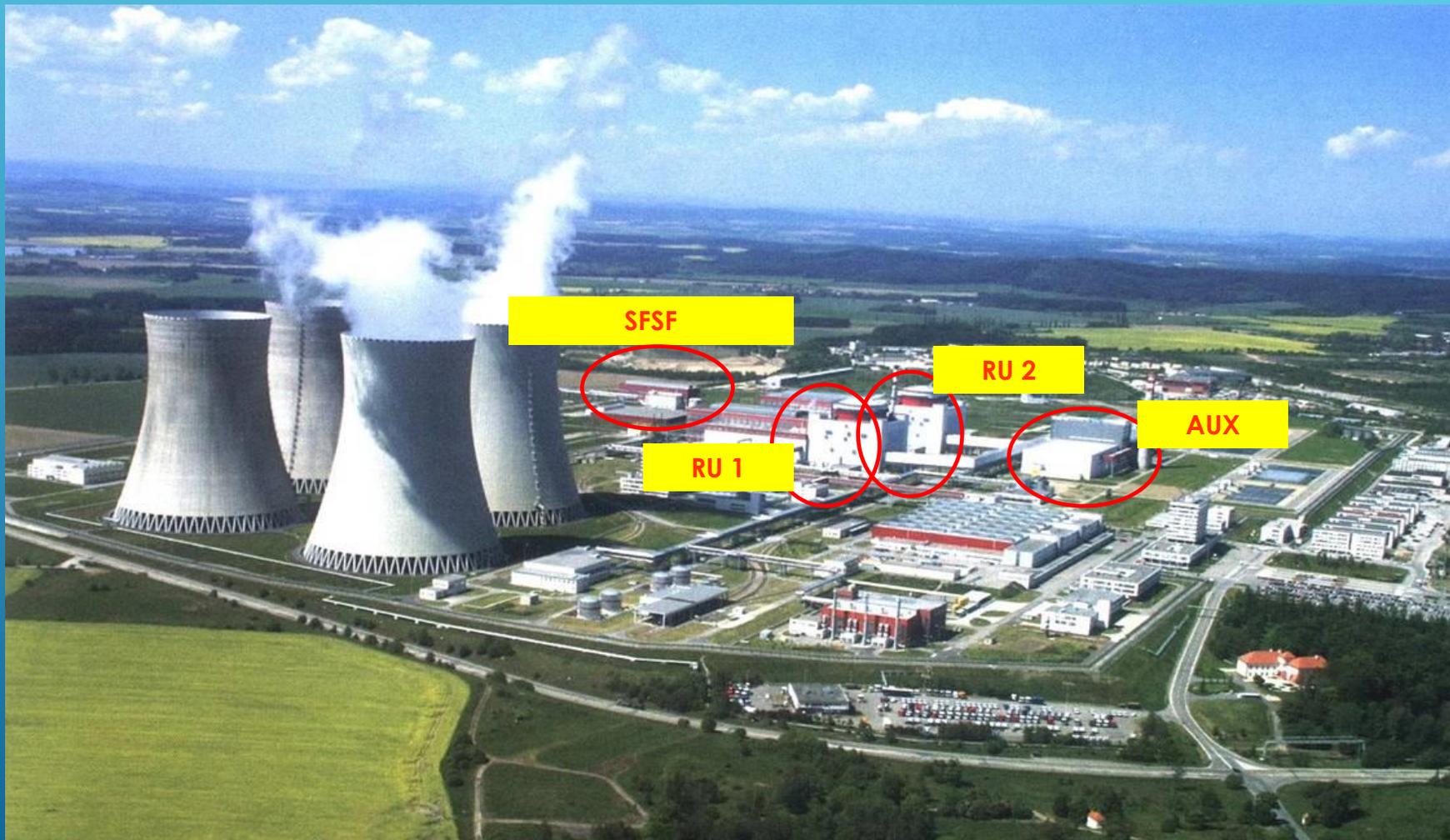
DUKOVANY SITE



DUKOVANY SITE



TEMELÍN SITE



TEMELÍN SITE



IMPLEMENTATION OF THE NAP NE

ČEZ Group: preparatory activities (II)

ČEZ SPV EDU II and ETE II are currently the investors and the owners of the lands which are planned for the construction of the new NPPs.

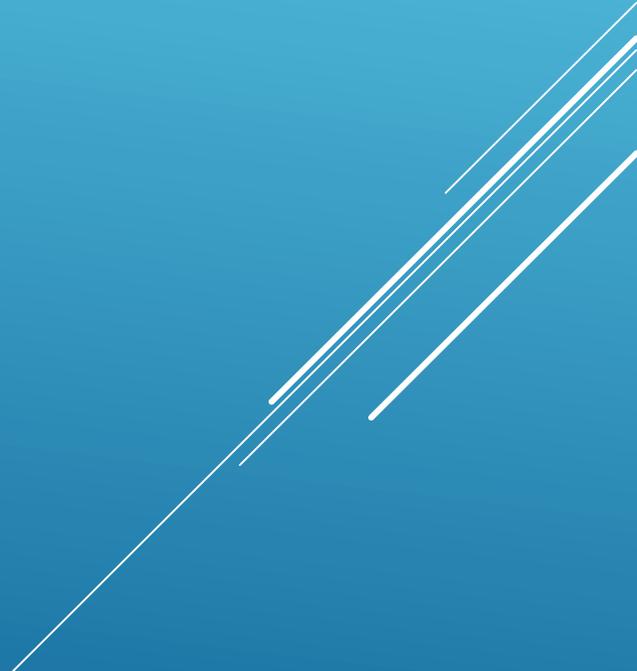
Status of activities carried out by both SPVs is as follows:

- ▶ NPP Dukovany 5,6
 - EIA initial phase – started in July 2016 and was completed in December 2016;
 - EIA full scope - ready to submit the request and relevant studies to the Ministry of Environment by December 2017
 - Assessment of limiting local conditions – completed in 2017/10
 - Site assessment and preparation of relevant studies and documentation – in process
 - Preparation of transport lines for heavy and large components and – in process
 - Preparation of electric connection lines – in process

- ▶ NPP Temelín 3,4
 - EIA – completed in 2013 (request for the extension of the Ministry of Environment decision is under preparation)
 - SÚJB Site Approval – issued in 2014
 - Local related investments – in process
 - Preparation of transport lines for heavy and large components – in process
 - Preparation of electric connection lines – in process

IMPLEMENTATION OF THE NAP NE

What is next?

Decorative white lines consisting of several parallel diagonal strokes in the bottom right corner of the slide.

CONTINUING PREPARATORY ACTIVITIES

We envisage the following steps and activities:

Completion before 2027-2028:

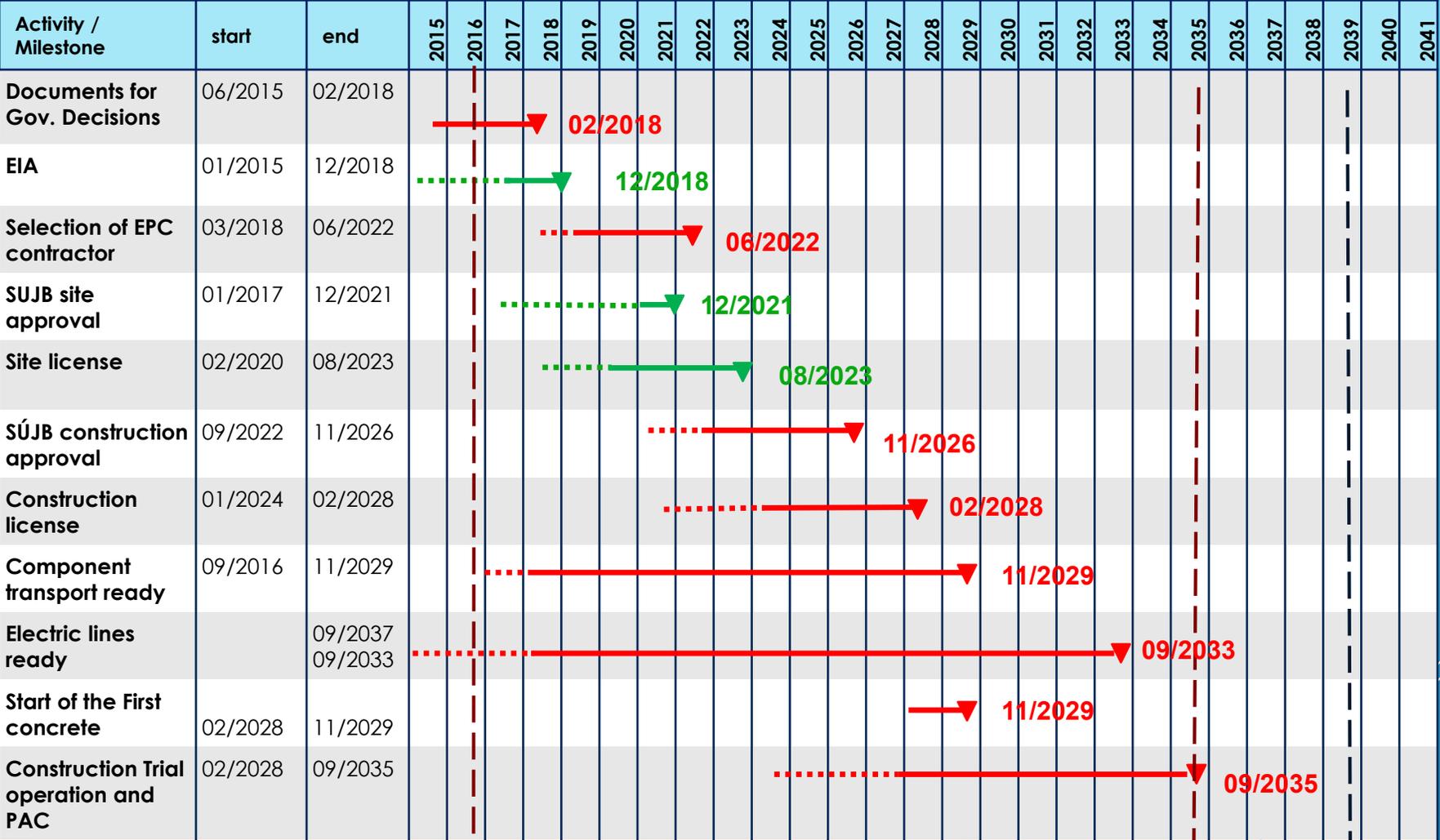
- ❑ Decision by the Government on Investment model and financing model (2016--2017- 2018)
- ❑ Complete the EIA process for EDU 5,6
- ❑ Selection of the NPP supplier
- ❑ Site and construction licensing processes
- ❑ Obtaining site and construction licenses for two units at each site

----- **HOLD POINT** -----

after 2027-2028:

construction of one to four new units depending on electricity needs and electric power of the new units 🚫

DESPITE THE DELAYS IN CRUCIAL DECISIONS THE DEADLINES FOR EDU 5,6 AND ETE 3,4 ARE STILL WORKABLE

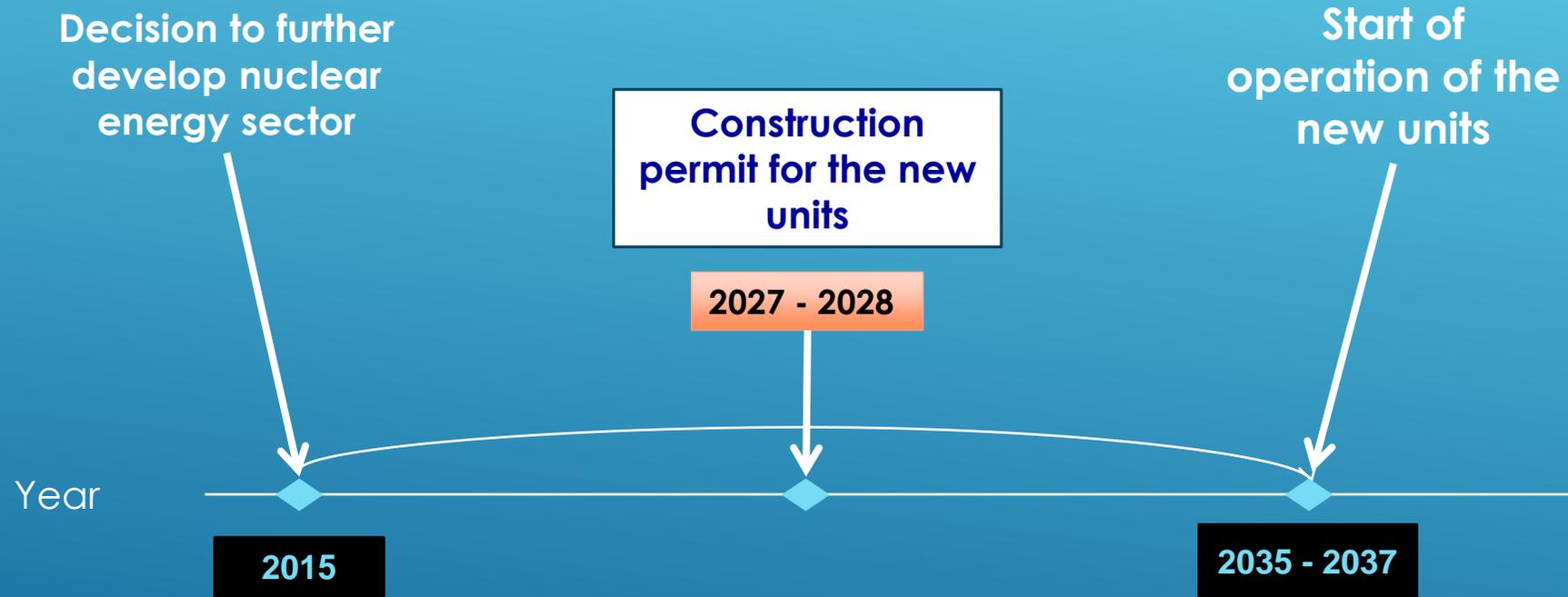


DESPITE THE CURRENT POST ELECTION SITUATION IN PRAGUE



I believe, we still can make it

The deadline 2035 is still possible to meet !



THANK YOU FOR YOUR ATTENTION

The image features a solid blue background with a subtle gradient. In the center, the text "THANK YOU FOR YOUR ATTENTION" is written in a bold, white, sans-serif font. In the bottom right corner, there are several thin, white, parallel lines that create a sense of motion or a modern design element.