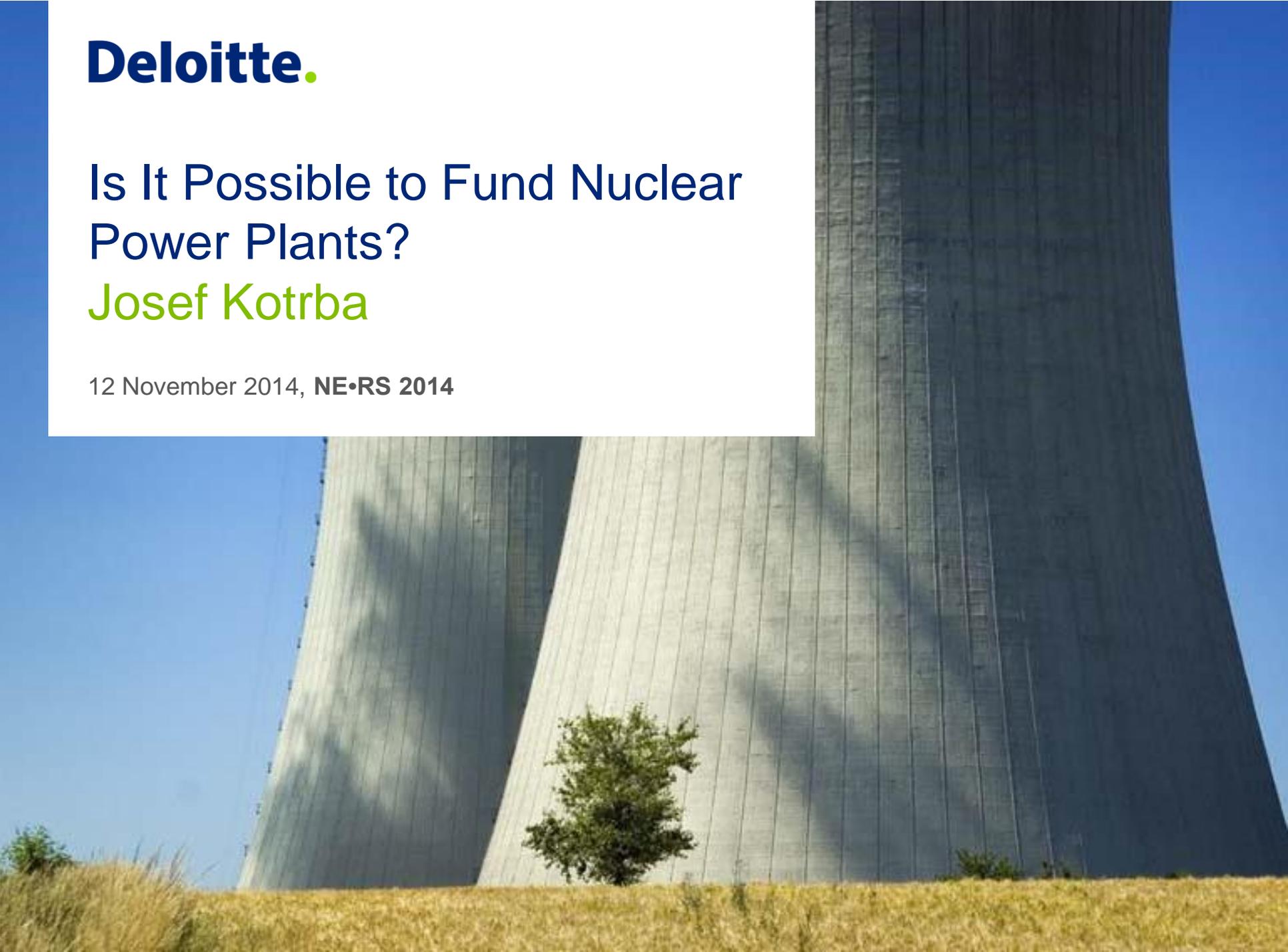


Deloitte.

Is It Possible to Fund Nuclear Power Plants?

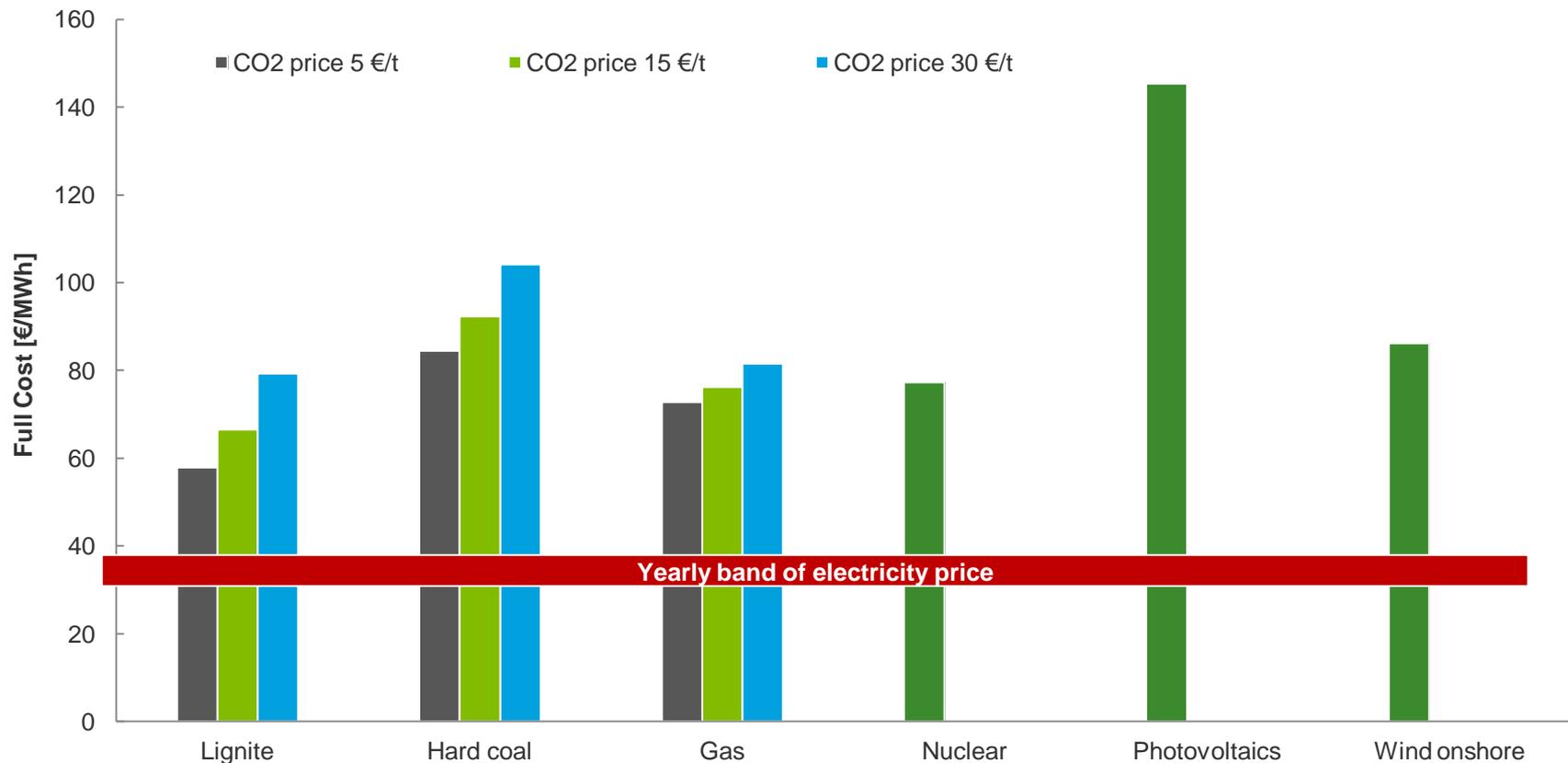
Josef Kotrba

12 November 2014, **NE•RS 2014**



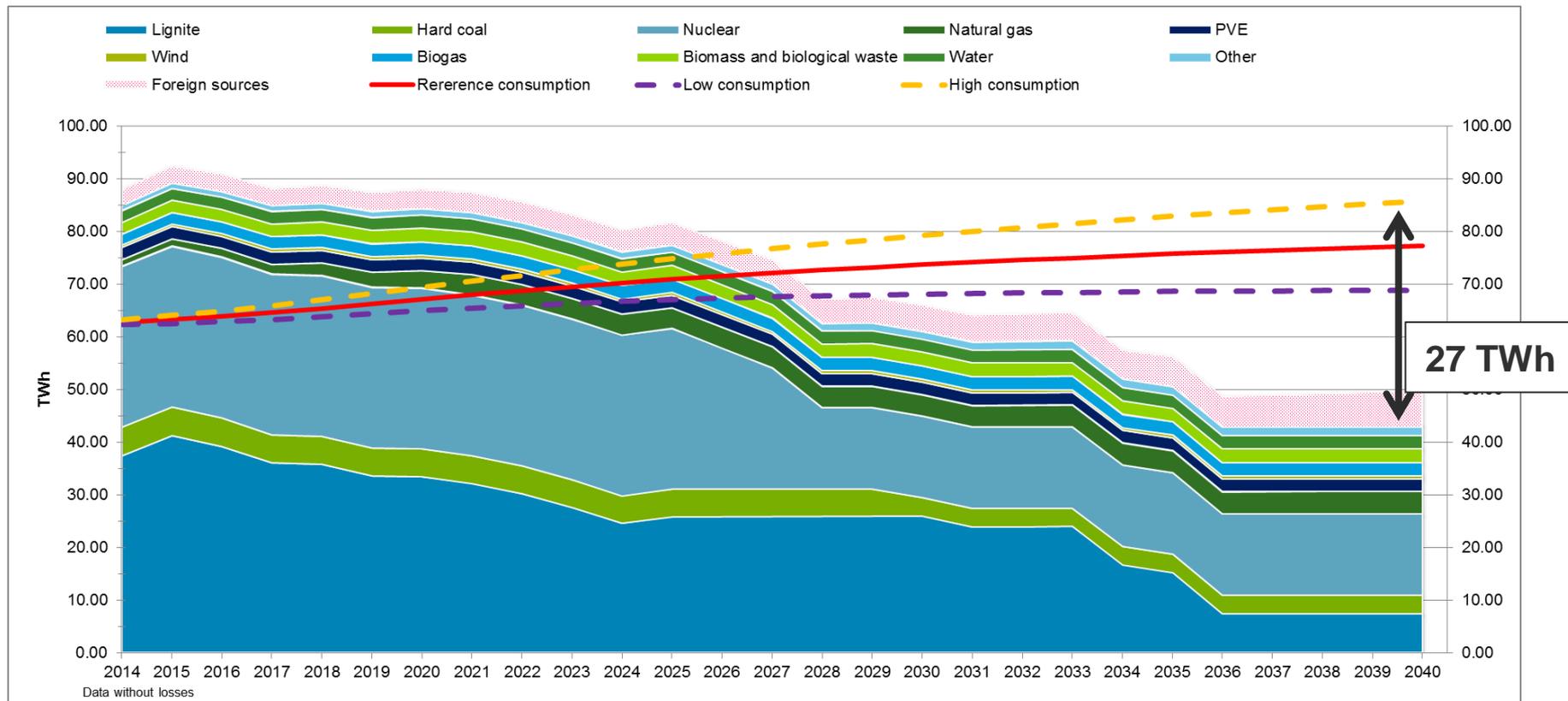
Nuclear Energy Is No Outsider Compared to Its Competitors

However, the current situation does not provide any motivation for new investments



Energy Sources Also Have a Limited Lifecycle

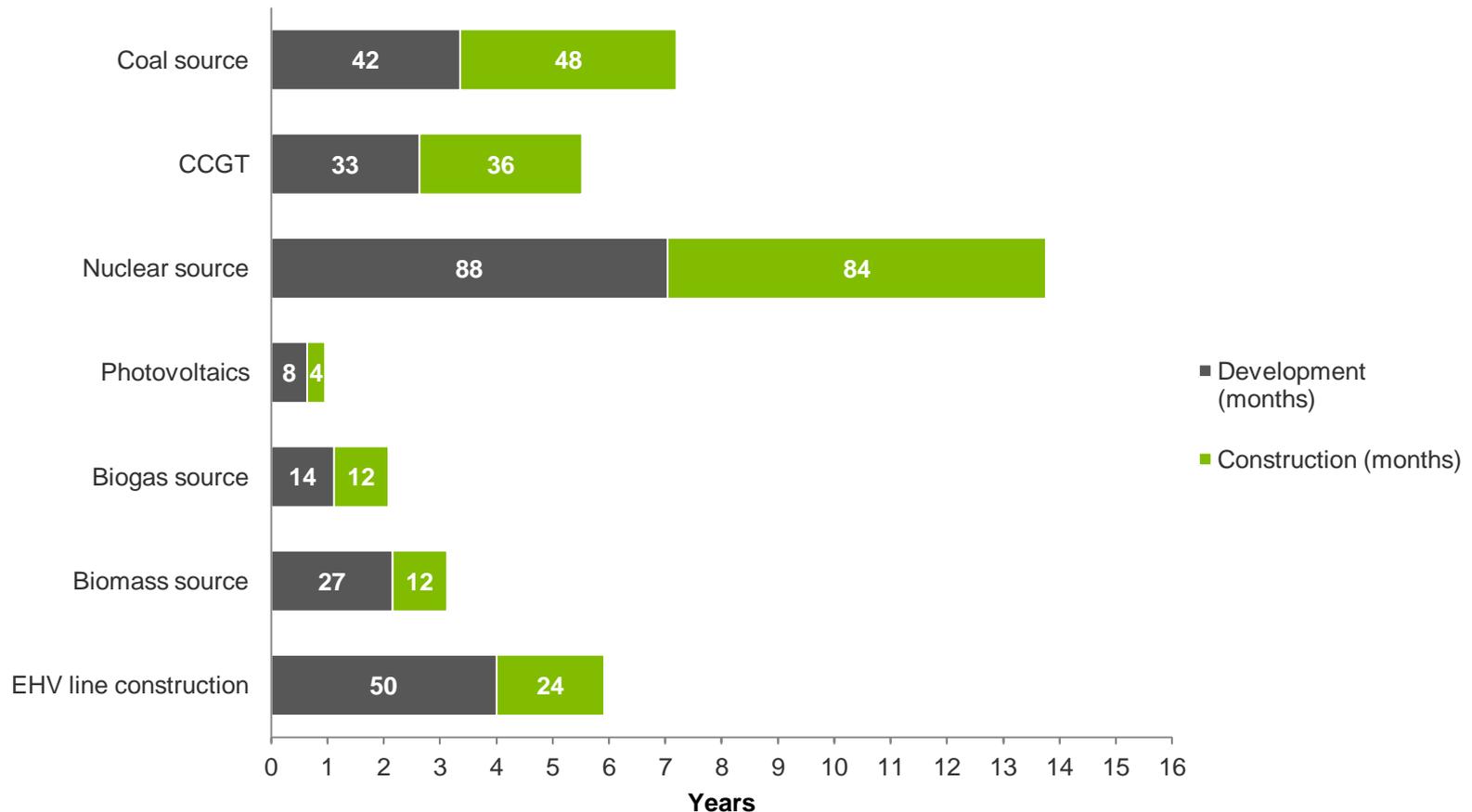
If the operation of Dukovany is discontinued for any reason, an almost immediate solution will be sought after 2025



The model demonstrates Deloitte's opinion on the operation of the current portfolio of power plants in the Czech Republic and shows the risk of shutdown of JEDU between 2025-2027, including the operation of the CCGT Počerady.

It Is Necessary to Ensure Secure Supplies...

... but the preparation and realisation of energy constructions takes an extremely long time



The power engineering sector is currently experiencing tough times with extreme uncertainty. The industry is only now going through the economic crisis, additionally increased by external regulatory interventions and off-market principles.

How is it possible to ensure at least an 8-year-long investment with an operational time of 60 years and a discounted payback of 35 years?

There Are Many Power Plant Construction Models

However, no one is willing to carry the ball and chain of nuclear energy without solving the risks

Existing funding methods in Europe



Hungarian-Russian Model – Inclusion of the Government

Gentlemen's agreements are also used in the construction of nuclear power plants

- **Agreement between the Hungarian Prime Minister and the Russian President**

- An agreement on funding the expansion of the Paks nuclear power plant was announced in January. The agreement was passed by the Parliament in June thanks to the majority of the governmental party Fidesz.
- The government has bought a project from MVM (owned by the government itself) and, as a result, the activities likely to be fully performed under state supervision.
 - Russia shall provide a loan amounting to a maximum of EUR 10 billion and shall cover 80% of costs.
 - The start of repayment of the principal is deferred by 10 years until 2026.
 - The repayment period is 21 years.
 - Hungary shall fully participate in budget overruns.

Period	Interest
2014 – 2025	3.9%
2026 – 2032	4.5%
2033 – 2039	4.8%
2040 – 2046	4.95%

- **Attitude of the opposition and the EU**

- The opposition has criticised the lack of discussion on the necessity of sources, the manner of concluding the agreement and Hungary's poor economic situation.
- The European Union has not provided any statement regarding the situation.

Contract for Difference (CfD) – Risk Sharing Model

The EU has approved the use of a new mechanism of nuclear energy in the UK in the form of CfD

- **Basic principles of the mechanism**

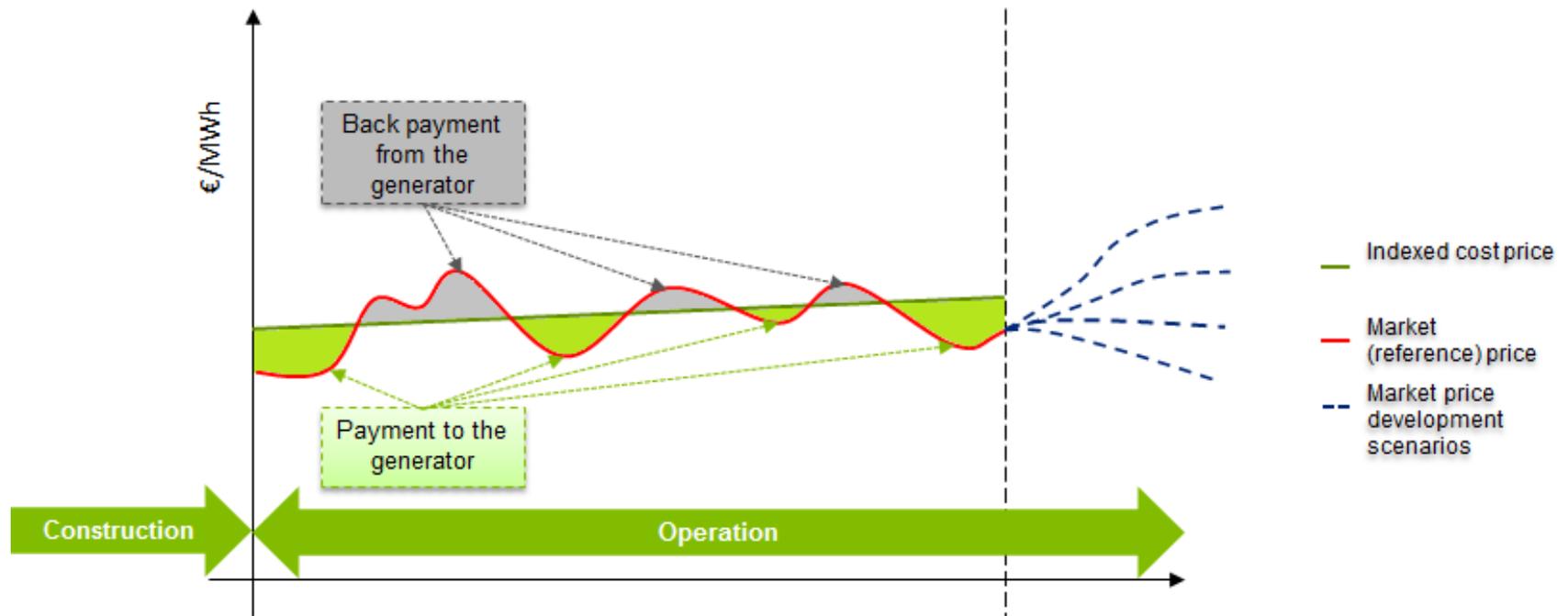
- The objective is to ensure the full return on investment so that the investor is willing to realise it.
- The mechanism is based on the full costs of sources – respecting the operation, depreciation and the cost of capital.
- CfD is a certain contract between the customer and the producer ensuring that the electricity will be supplied for a justifiable price.
- Based on the real market price of electricity and the arranged cost price of the supported source, both parties shall compensate the surplus/shortage in payments.

- **Division of risks**

- The length of contract should respect the needs of the producer as well as provide a partial compensation to the consumer; however, it must ensure at least the discounted payback period.
- All risks outside the change in the market price are borne by the producer! Besides, the contract shall respect the market principles to the maximum extent possible.
- CfD has been concluded today for the Hinkley Point C power plant in the UK for 35 years with the cost price of 92.50 GBP/MWh (117.48 EUR/MWh).

Contract for Difference – Risk Sharing Model

The mechanism should be set symmetrically to avoid excessive burden of the consumer



Mankala – Cooperation Model

Every penny makes a nuclear pound; no project is too large, but multiple entities are needed for the realization

- **Increasing the involvement of consumers**

- The model is very similar to the consumption cooperative. Mankala predominantly engages consumers in electricity generation.
- The consortium of consumers and energy companies will found a company for the construction and operation of sources. The power plant only becomes a profit centre and consumers take energy at generation costs.
- The advantage consists of the direct engagement of consumers in the generation and higher competition in the sector with lower entry costs.

- **Current use**

- The model is used in the ongoing construction of the Olkiluoto 3 nuclear power plant as well as the planned Hankiviki 1 power plant. For instance, as many as 50 companies may be involved in the construction.
- 40% of electricity is generated in Finland in this manner. The model is not used in other European countries.

The better and more predictable the setting of the market environment is, the easier the funding of nuclear power plants will be.

If the future market situation remains unpredictable and the role of support continues to be significant, energy companies will not be able to fund nuclear energy on their own. The government will thus have to find a special mechanism for this type of source.



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