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Description of the Financing Arrangement for Nuclear Power Plant Decommissioning in Belgium

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Topics

- Context
- Overview NPP's in Belgium
- History of financing arrangements
- Current mechanism
- Challenges

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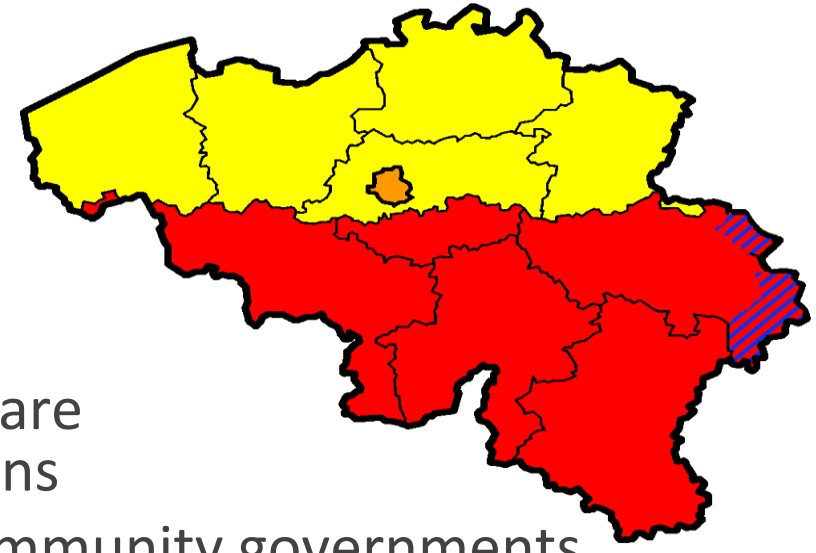
Belgium is a federal state with a division of competences

- The constitutional reforms in the 1970s and 1980s led to the creation of a federal state with:
  - three communities
  - three regions
- These institutions have powers and responsibilities for the different fields
- The Federal government has:
  - Residuary competences: all competences that are not explicitly assigned to communities or regions
  - Shared competences: federal and regional /community governments are equally competent
  - Explicit competences: clearly assigned to the Federal government
- Non-nuclear energy is a regional competence



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Nuclear fuel cycle and nuclear R&D is an explicit federal competence

- Nuclear fuel cycles and related R&D programmes
  - Nuclear provisions
  - Fission and fusion nuclear R&D (mainly carried out at the SCK•CEN)
  - Nuclear waste management
- Other non nuclear federal competences
  - Security of supply, national prospective studies and energy statistics and balances
  - Large stockholding installations, production and transmission / transport of energy (electricity grid >70 kV), including large storage infrastructure
  - Electricity transport tariffs (Federal Regulator – CREG)
  - Offshore wind energy

IAEA nuclear profile - https://cnpp.iaea.org/countryprofiles/Belgium/Belgium.htm

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Overview NPP's in Belgium - 1

- 2 sites: Doel and Tihange (7 units)
- Total installed capacity 5.921 MW

Reactor Unit	Type	Net Capacity [MW(e)]	Status	Operator	Reactor Supplier	Construction Date	First Criticality Date	First Grid Date	Commercial Date
DOEL-1	PWR	433	Operational	ELECTRAB	ACECOWEN	1969-07-01	1974-07-18	1974-08-28	1975-02-15
DOEL-2	PWR	433	Operational	ELECTRAB	ACECOWEN	1971-09-01	1975-08-04	1975-08-21	1975-12-01
DOEL-3	PWR	1006	Operational	ELECTRAB	FRAMACEC	1975-01-01	1982-06-14	1982-06-23	1982-10-01
DOEL-4	PWR	1033	Operational	ELECTRAB	ACECOWEN	1978-12-01	1985-03-31	1985-04-08	1985-07-01
TIHANGE-1	PWR	962	Operational	ELECTRAB	ACLF	1970-06-01	1975-02-21	1975-03-07	1975-10-01
TIHANGE-2	PWR	1008	Operational	ELECTRAB	FRAMACEC	1976-04-01	1982-10-05	1982-10-13	1983-06-01
TIHANGE-3	PWR	1038	Operational	ELECTRAB	ACECOWEN	1978-11-01	1985-06-05	1985-06-15	1985-09-01

Overview NPP's in Belgium - 2

- All PWR's, second generation
- First connection to the grid: between 1975 and 1985
- 1 nuclear operator ELECTRABEL - ENGIE (part of ENGIE (FR))
- EDF BELGIUM owns 50% of Tihange Unit 1
- EDF LUMINUS has a stake of 10,2% in 4 nuclear units (Tihange 2 & 3 and Doel 3 & 4)
- Synatom is responsable for the management of the fuel cycle of NPP's

Overview NPP's in Belgium - 3

- Since 2003, nuclear phase-out policy towards 2025
- The law limits the operation of NPP's to 40 years
- In 2013 and 2015 additional 10 years granted for the 3 oldest units
  - because of concern security of supply of electricity
  - upon regulatory approval (FANC-AFCN)
- Consequences of the decommissioning :
  - closing 7 units in 4 years time (2022 – 2025)

History of financing arrangements

- From 1975 to 1985: no specific rules
- From 1985: convention between the operators and the Belgian state
  - created the first obligation to provision for future liabilities
  - the provisions were based on the initial investment amount
  - through a lump sum, fixed for 5 years, during a certain period
- New law on 11th April 2003 imposes a prudentential control on the existance, sufficiency and the availability of decommissioning funds

Current mechanism - 1

- Since 2003 a specific legal arrangement
- All provisions (decommissioning and spent fuel) are to be managed in a designated company, Synatom
- Synatom = 100% daughter company of Electrabel-ENGIE but a seperate legal unit (= **internalised system with segregated funds** within a group)
- 2 government representatives in the Board
- All owners must pay into the same fund
- Creation of a supervising body : Commission on nuclear provisions
- The modifications of the nuclear phase-out law had no direct impact on the provisioning mechanism

Current mechanism - 2

- Methodology:
  - future liabilites are estimated using reference scenarios elabotared by ONDRAF/NIRAS (waste) and Synatom (recycling or direct disposal)
  - the net present value of future liabilaties must be present in the accounts of the nuclear provision company (Synatom) following IAS 37 rules
  - built up during exploitation of the reactors with yearly interest supplements
  - if shortage when decommissioning: deficit must be covered by the nuclear operator
  - every three years : audit of the methodology, reference scenario, …

Current mechanism - 3

- Evaluation by the Commission on nuclear provisions:
  - submission by the operator of a decommissioning scenario
  - submission by Synatom of a scenario for the spent fuel
  - cost estimation and planning of the expenditures
  - calculation method and discount rate
  - the Commission has to ask the opinion of NIRAS-ONDRAF (the Belgian Agence for radioactive waste management)
  - the Commission accepts or asks for changes if it disagrees with the proposed methodology or financial parameters (inflation, discount rate, …)

Current mechanism - 4

- Management of the provisions:
  - done by the nuclear provision company, Synatom
  - can lend up to 75% of the provisions to the nuclear operators
  - condition: - good credit rating (> BBB)
    - solvancy ratio must be whithin agreed range
  - if credit quality degrates: loan percentage is reduced
  - 25% of the provisions have to be invested outside the assests of the nuclear operatos, whith sufficient diversification and spread
  - a minimum of 3 years of liquidity is required at any point in time

Current mechanism - 5

- State of play:
  - funds at the end of 2015:
    - 3 301 million euro for decommissioning
    - 4 733 million euro for spent fuel management
  - current discount rate : 4,8%
  - no shortages as differences in perfomances must be supplemented by the operators
  - 5th evaluation by the Commission on nuclear provisions started last week

Challenges

- All reactors still operational but the 7 reactors will shut down in 4 years time
- Discount rate under pressure due to very low long term risk-free interest rates
- Mergers, acquisitions and corporate restructurings in a volatile European energy market
- Polical decision on the final disposal of high activity waste still needs to be made (potential impact on costs for HLW-management)

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Questions ?

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