

Towards a French Nuclear Phase-Out?

New Directions in the Energy Debate

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Nuclear Energy Conference 2015

Europe without nuclear - What does Europe's energy future look like?

19th May 2015

Redoutensäle in Promenadenhof

Linz - Upper Austria

WISE-Paris: committed to independent expertise.....

- Information and consultancy **independent agency** created in 1983
- Non profit status and **general interest** goal
- A **service** to institutional players, academics, NGOs, medias...
- A large but intrinsically consistent **range of issues** covered

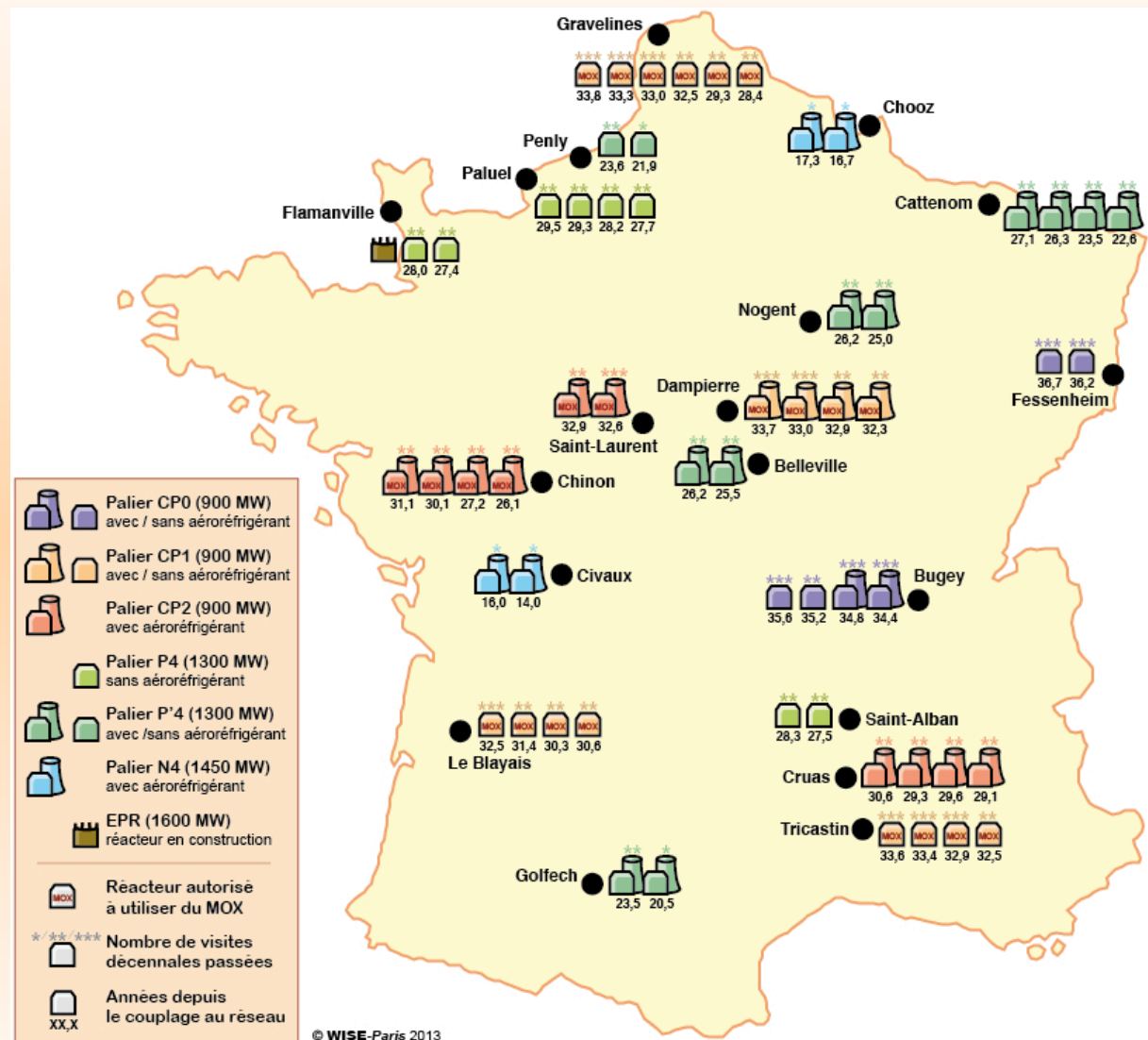


- **Systemic** analysis of issues, international approach
- Non institutional but **professionnal** expertise
- **Critical thinking** but no activist activities
- Strong commitment to developing **pluralist expertise**

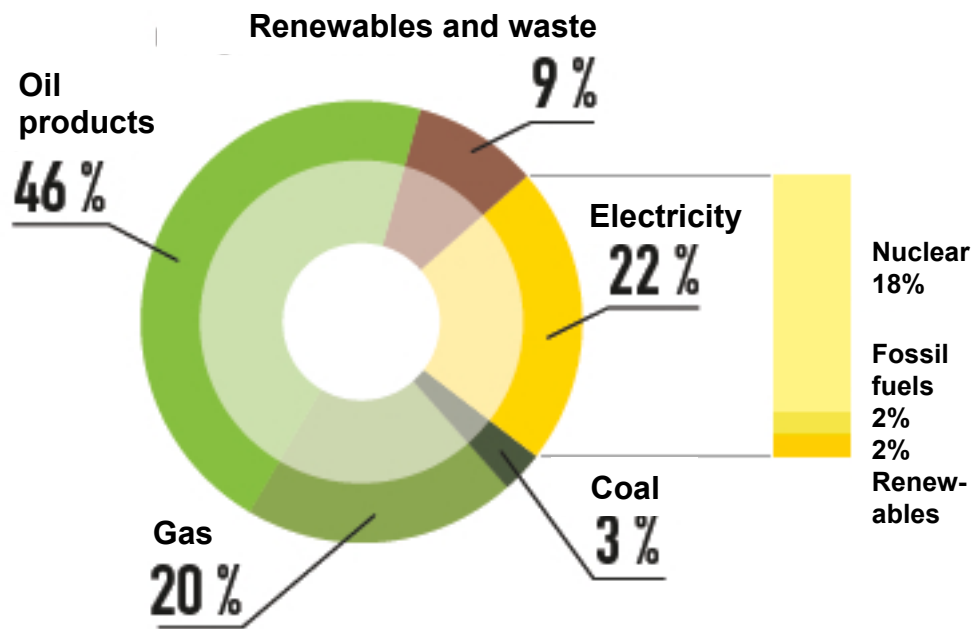
Note than since the early 1990s WISE-Paris has no tie with any other WISE organisation

French nuclear programme

- 58 reactors on 19 sites
- A single operator – EDF (84.5% State-owned)
- An integrated fuel and reactors service company – AREVA (83.2% State-owned)
- A much standardized fleet (all PWRs, 6 standards) :
 - 34 units / 3 standards 900 MWe
 - 20 units / 2 standards 1.300 MWe
 - 4 units / 1 standard 1.450 MWe
 - (plus EPR under construction)



French final energy consumption
by energy source (2011)



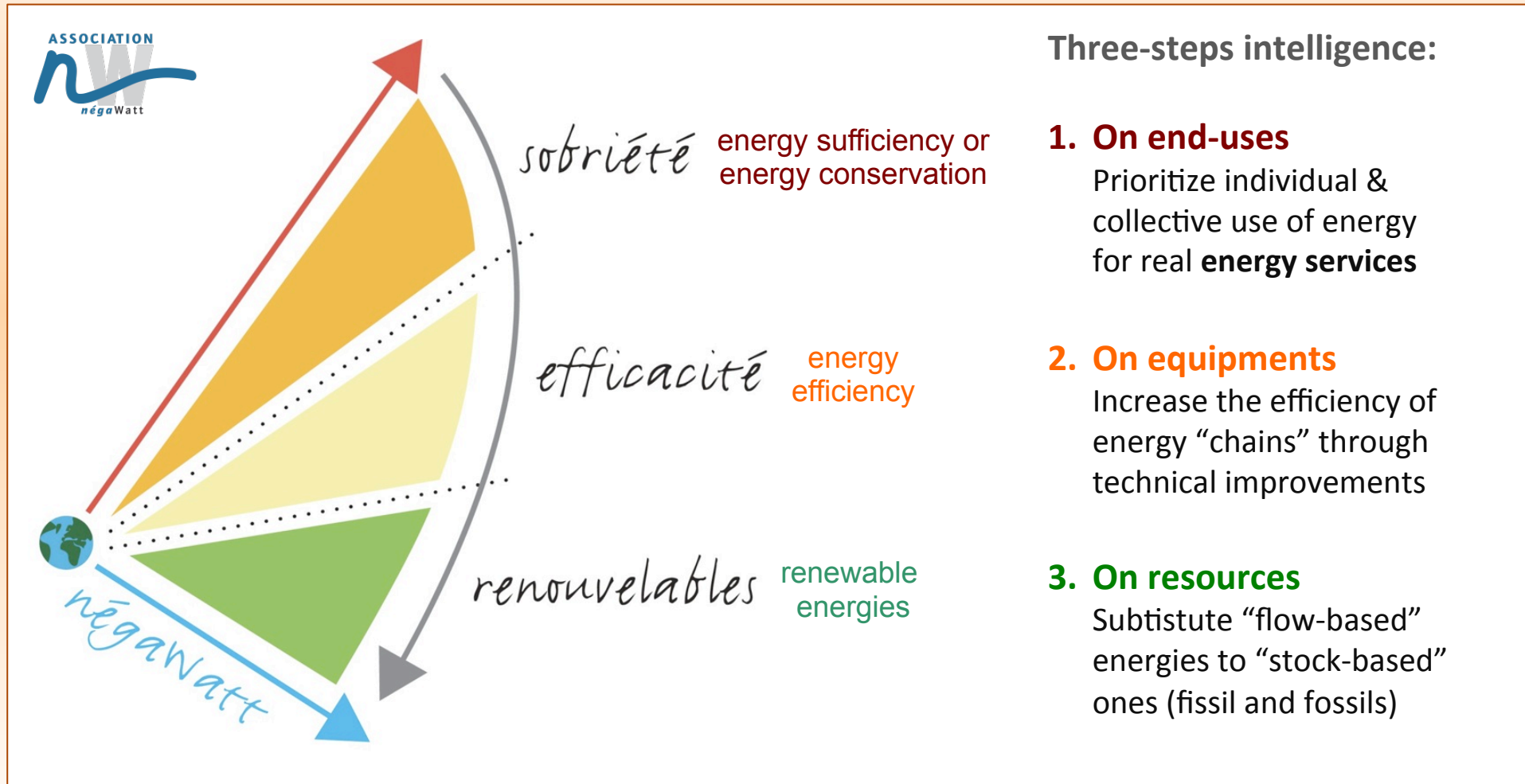
Source: bilan de l'énergie, 2011, SOeS

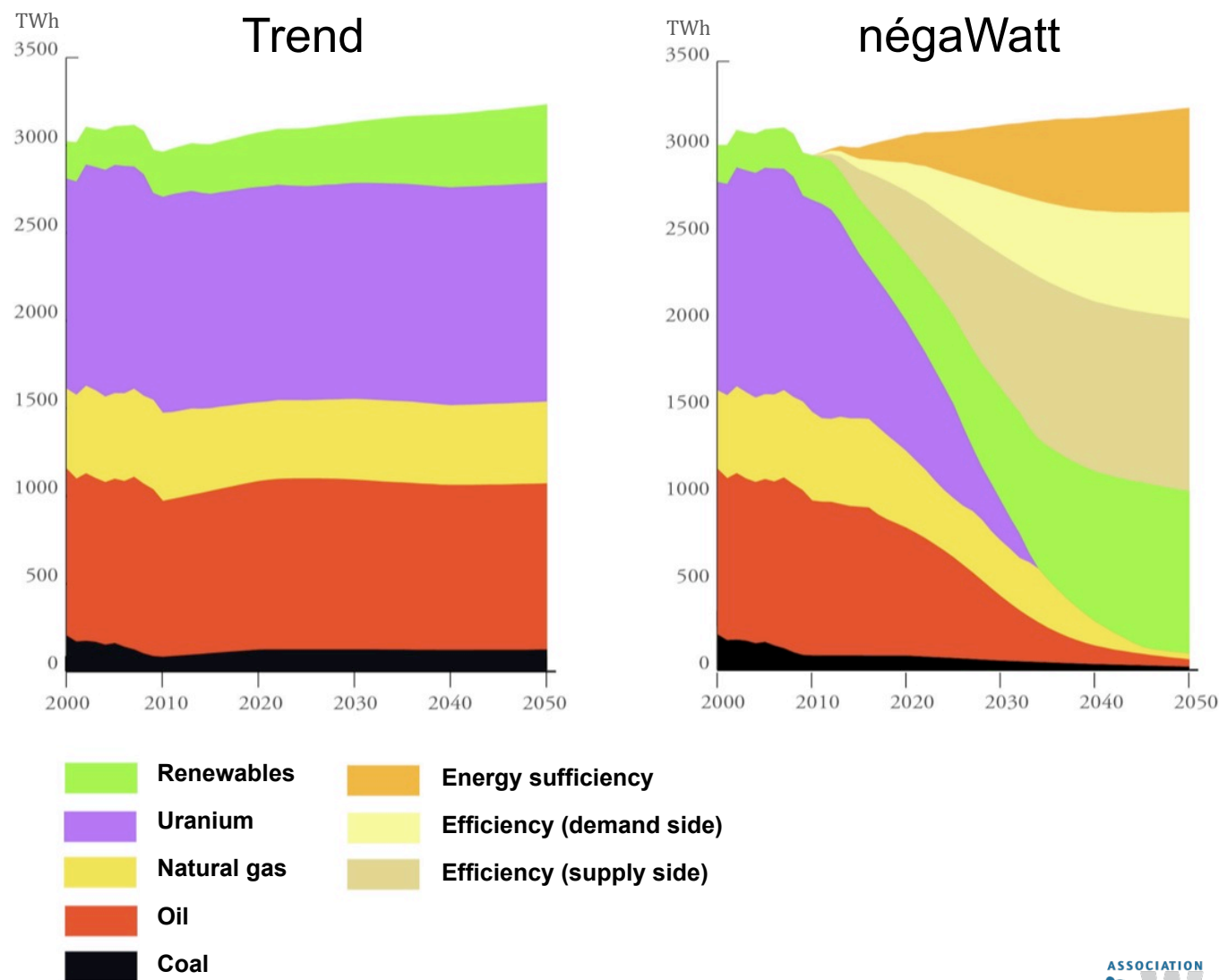
French energy status

- **Around 70% dependency on (imported) fossil fuels**
National energy bill close to €60-70bn/a
- **GHG emissions roughly 4 times the world sustainable level**
=> objective of 4-fold cut by 2050
- **Electricity up to 80% dependent on nuclear power, with an ageing reactors fleet**
(average >30 years)

plus a broader need to renovate and replace ageing energy infrastructures

négaWatt scenario: an independent work published in 2011 by a group of experts
Explore the potential for energy transition in France by 2050 based on the négaWatt approach





Results by 2050

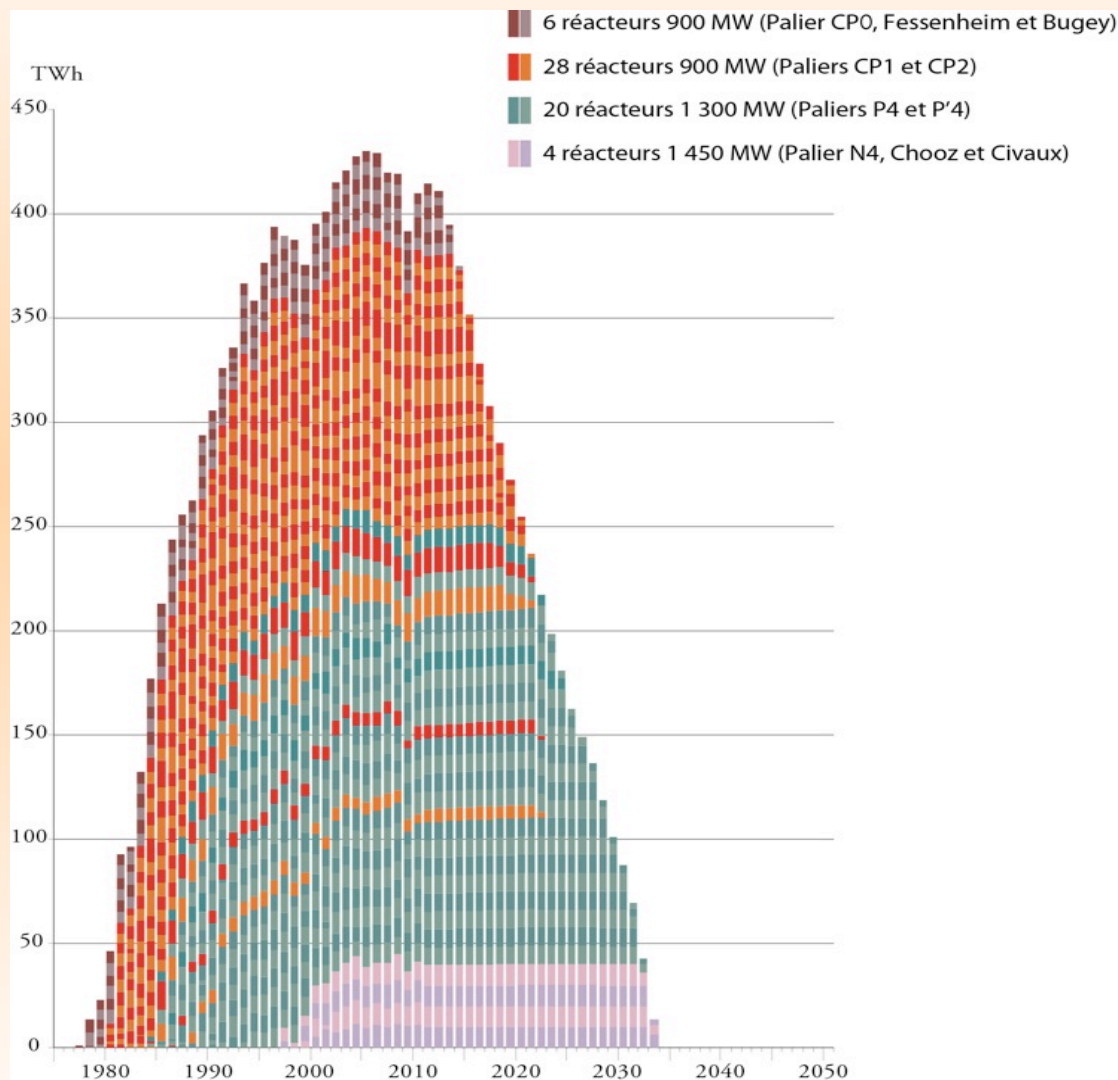
**67% reduction
of primary energy
consumption**

**93% based on
local renewable
energy resources**

**+ 16-fold reduction
of energy related
CO₂ emissions
(compared to 2010)**



Nuclear phase-out in 22 years



- Step-by-step implementation
- No extension after 40 years
- No start of EPR (Flam-3)

2011-2017
3 500 MW / year

2018-2027
2 500 MW / year

2028-2033
4 500 MW / year

A multi-years political process:

- **From Fukushima to May 2012 Presidential elections**

- Some political leaders moving after Fukushima catastrophe
- Hollande introduces the objective of 50% nuclear by 2025
- Strong symbolic move: Hollande during the campaign calls for phasing out “double dependency” on oil and nuclear

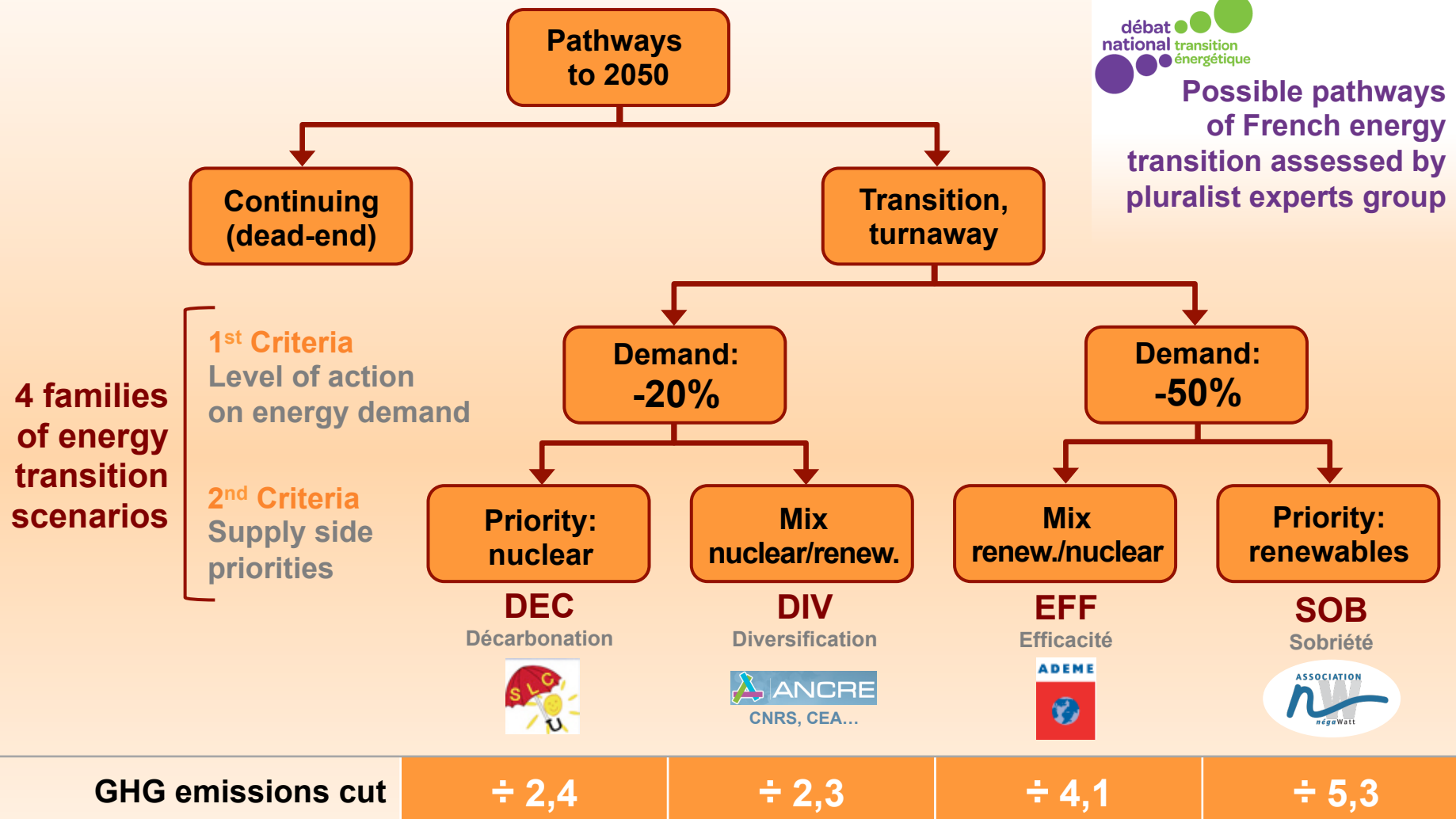


- **From the elections to an Energy Transition Bill**

- Large national and decentralized debate on energy transation from Dec. 2012 to July 2013
- Draft Energy Transition bill presented to Parliament July 2014
- Final law to be passed June 2015



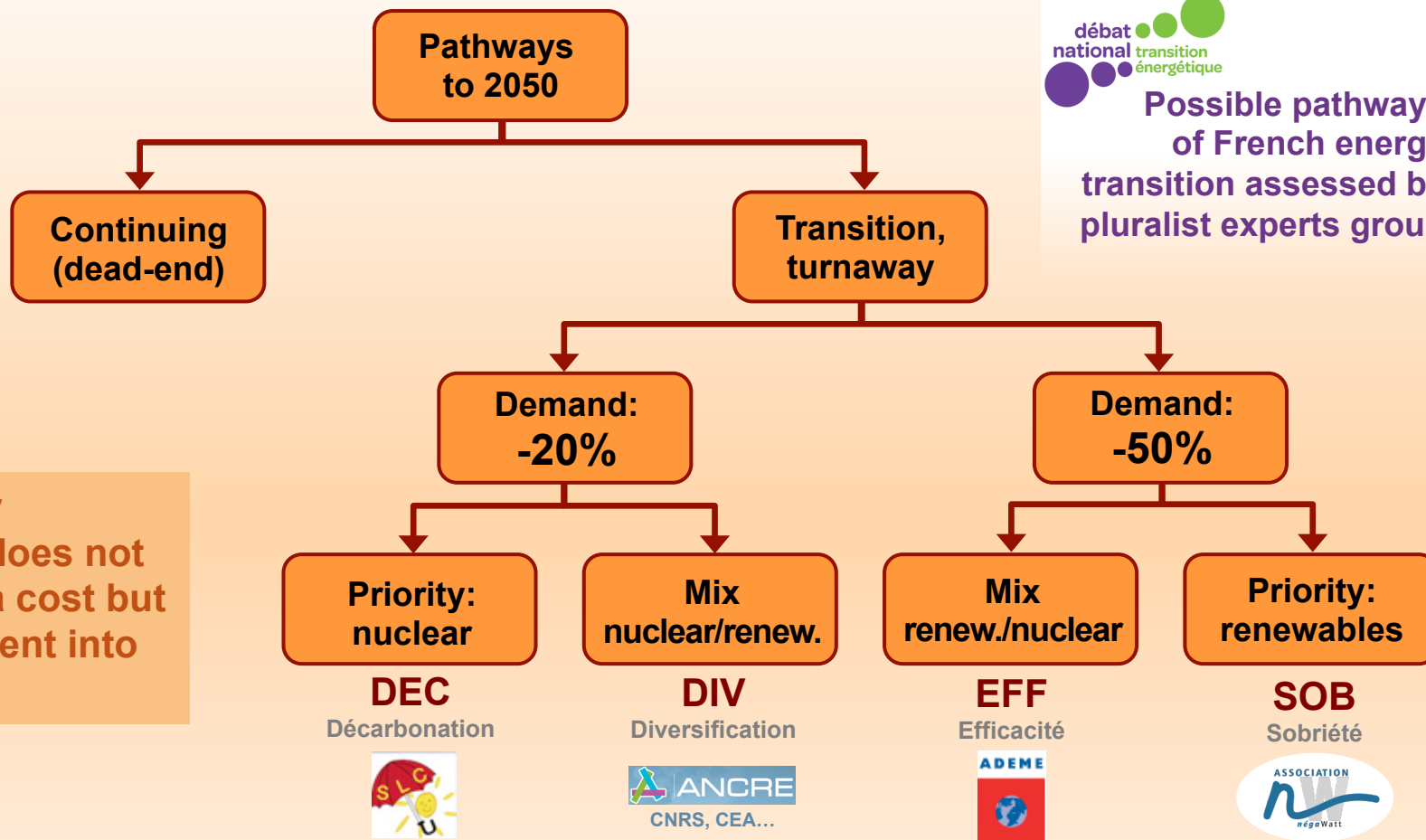
débat national transition énergétique
Possible pathways of French energy transition assessed by pluralist experts group



Needs 2-fold reduction of energy demand to meet 4-fold reduction of GHG emissions

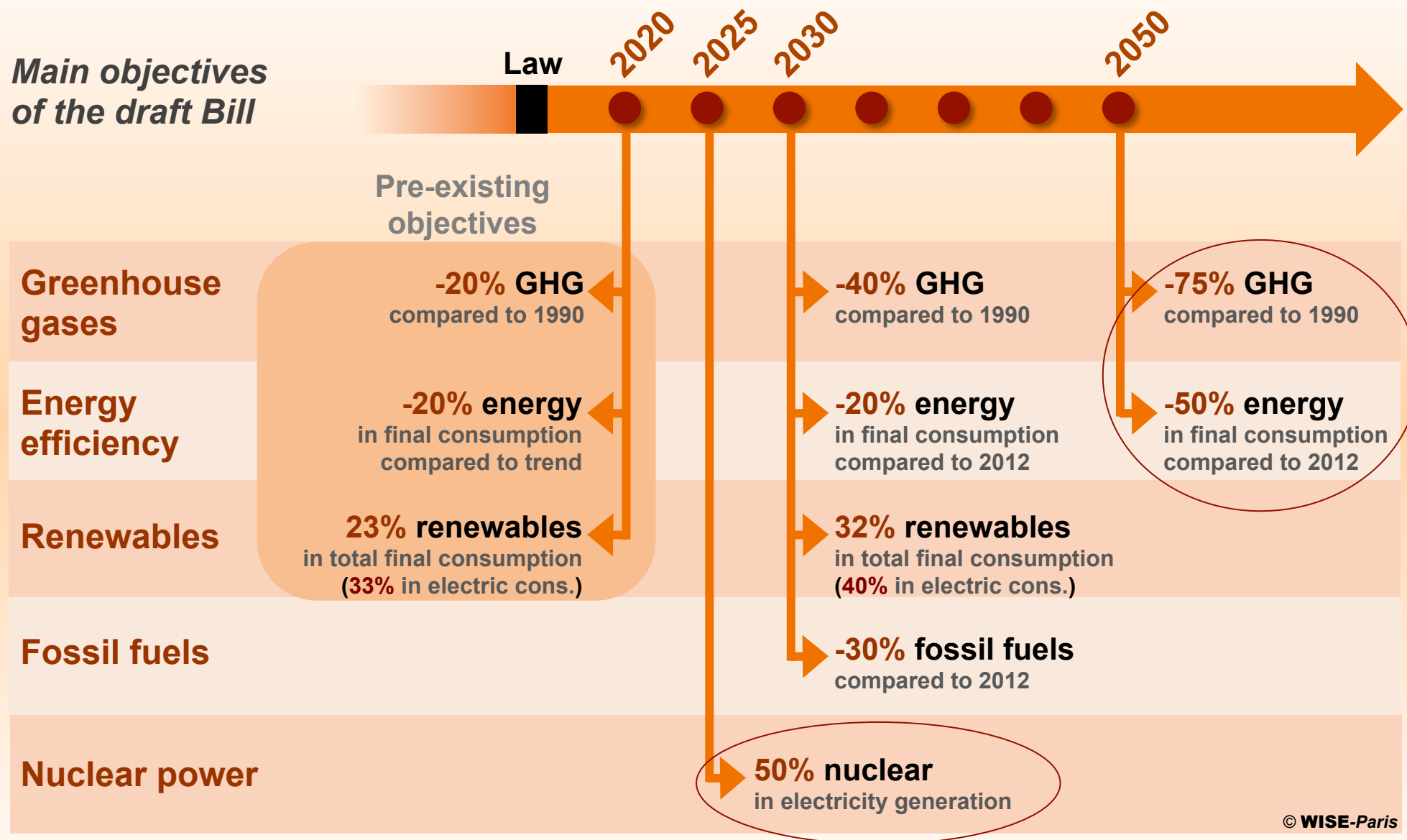
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The energy transition does not represent a cost but an investment into the future



GHG emissions cut	÷ 2,4	÷ 2,3	÷ 4,1	÷ 5,3
Net Investments / Energy imports (2012-2050)	-€1,145bn	-€1,151bn	-€1,389bn	-€1,470bn

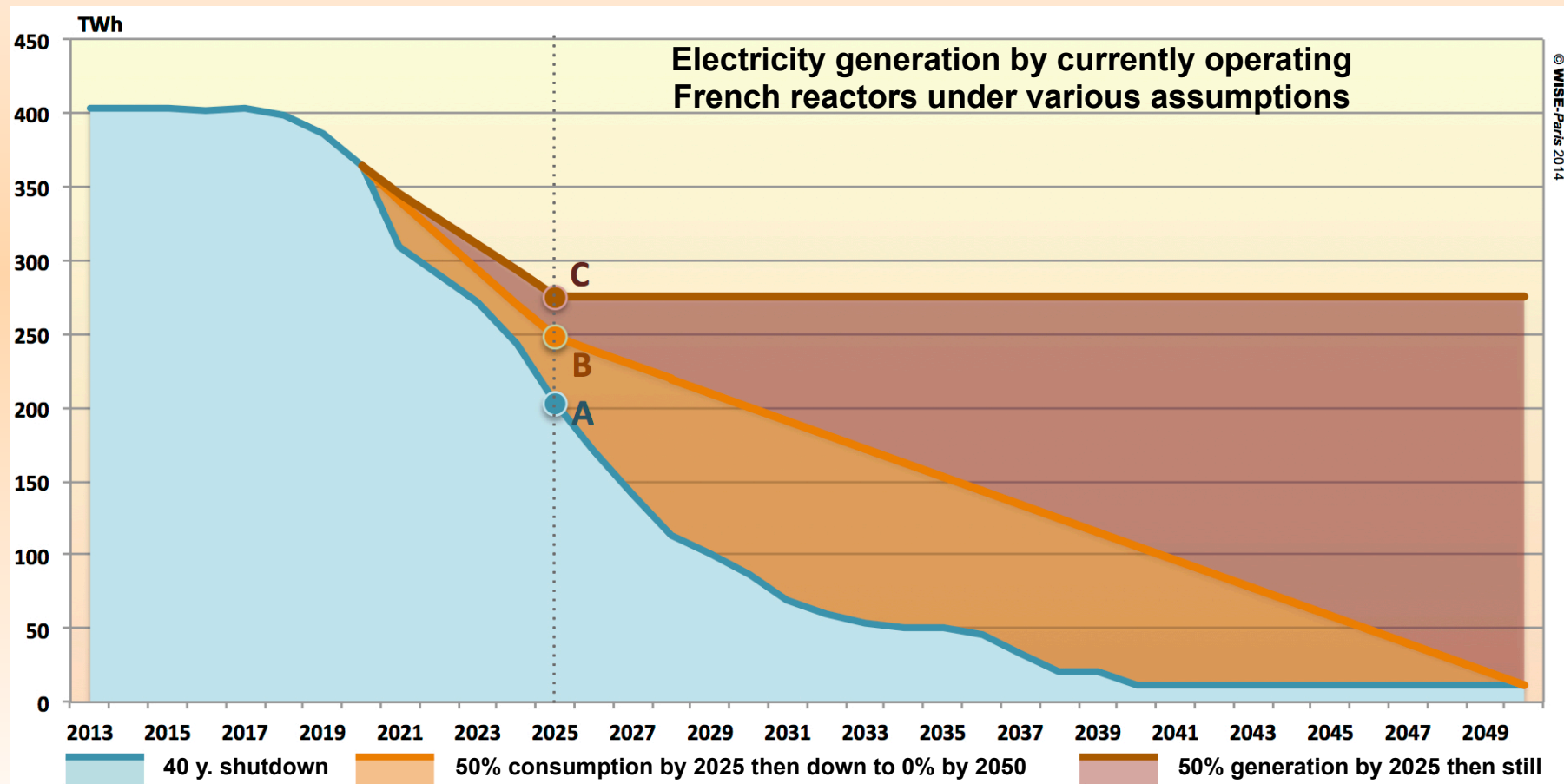
Main objectives of the draft Bill



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50% by 2025 is a very constrained trajectory

- Assuming flat electricity consumption, objective means some 20 reactors shut-down
- Yet this is less than the number that should shut down if no extension after 40 years



From 75% to 50% nuclear in 2025?

- **No clear framework for reactors shutdown:**

- Commitment on Fessenheim-1 & 2 by 2016
- No real action taken yet for this to happen
- No mechanism for the Government to impose shutdowns to EDF
- Only a 63.2 GW cap (current existing capacity)
- “Pluriannual energy planning” + EDF should decide
- A public inquiry will be needed for a reactor to get license extension beyond 40 years

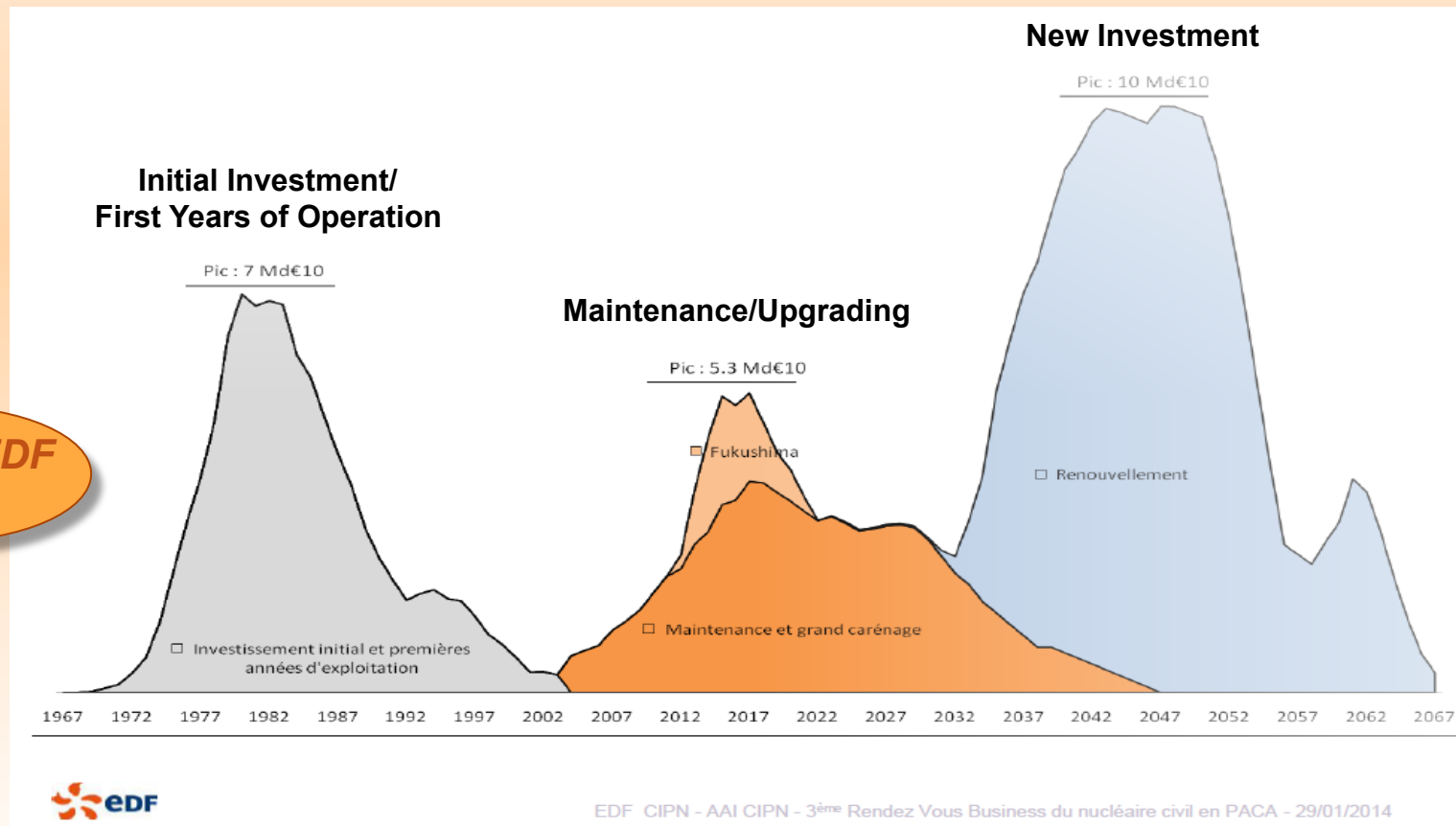
- **No clear vision of the direction after 2025:**

- Nothing said about nuclear power after 2025
- The Government is neither aiming for phase-out...
- ...nor is ready to speak about new reactors



Focus: investments needed to maintain EDF reactors

- Court of Accounts: €110bn at least ahead for reinforcing safety and extending lifetime
Highly challenging industrial and financial programme – out of EDF's real capacity
- Even greater costs to replace existing reactors by EPRs on the longer term

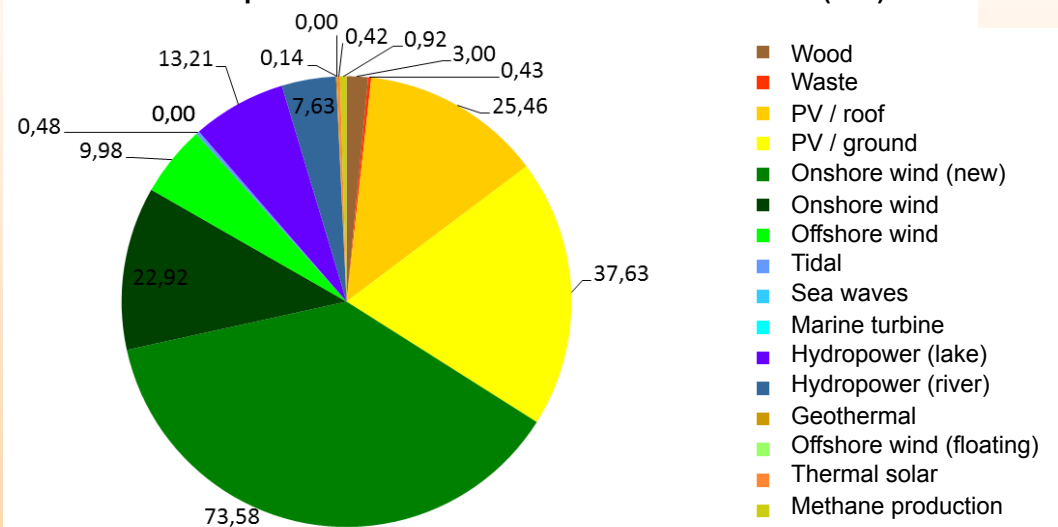


New official study:

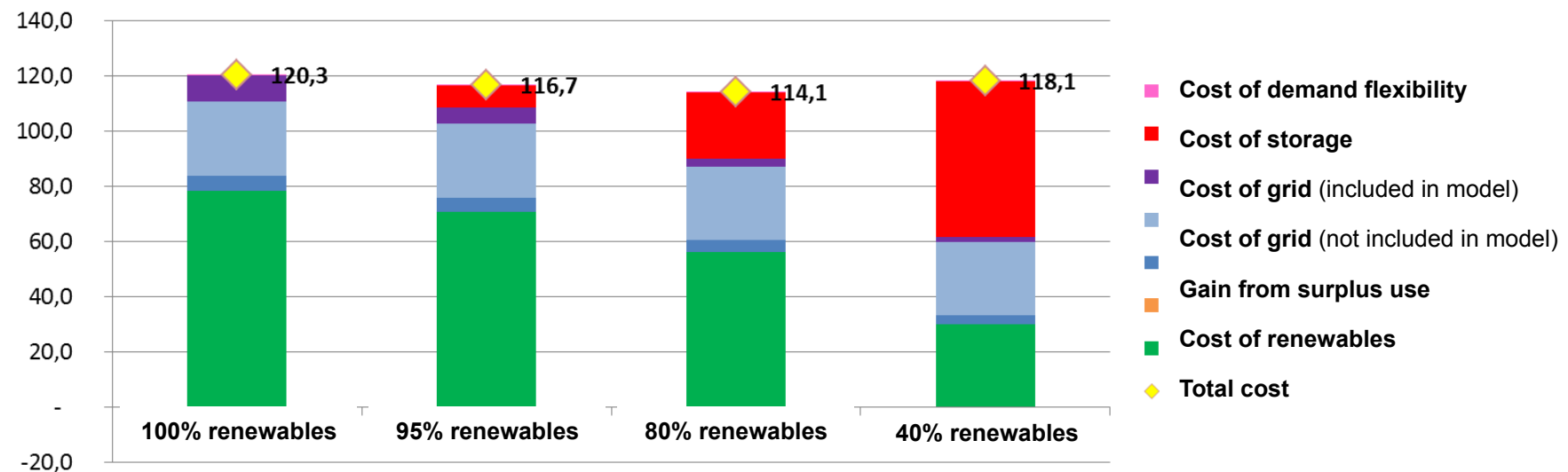
(by French Energy management agency)

- 100% renewable electricity by 2050 is realistic and affordable (same cost as 40% plus nuclear)
- Study completed in April 2015
Government tried to push back publication but the study leaked

Installed capacities in central 100% renewables scenario (GW)



Energy cost (€/MWh)



Thank you for your attention

More information :



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