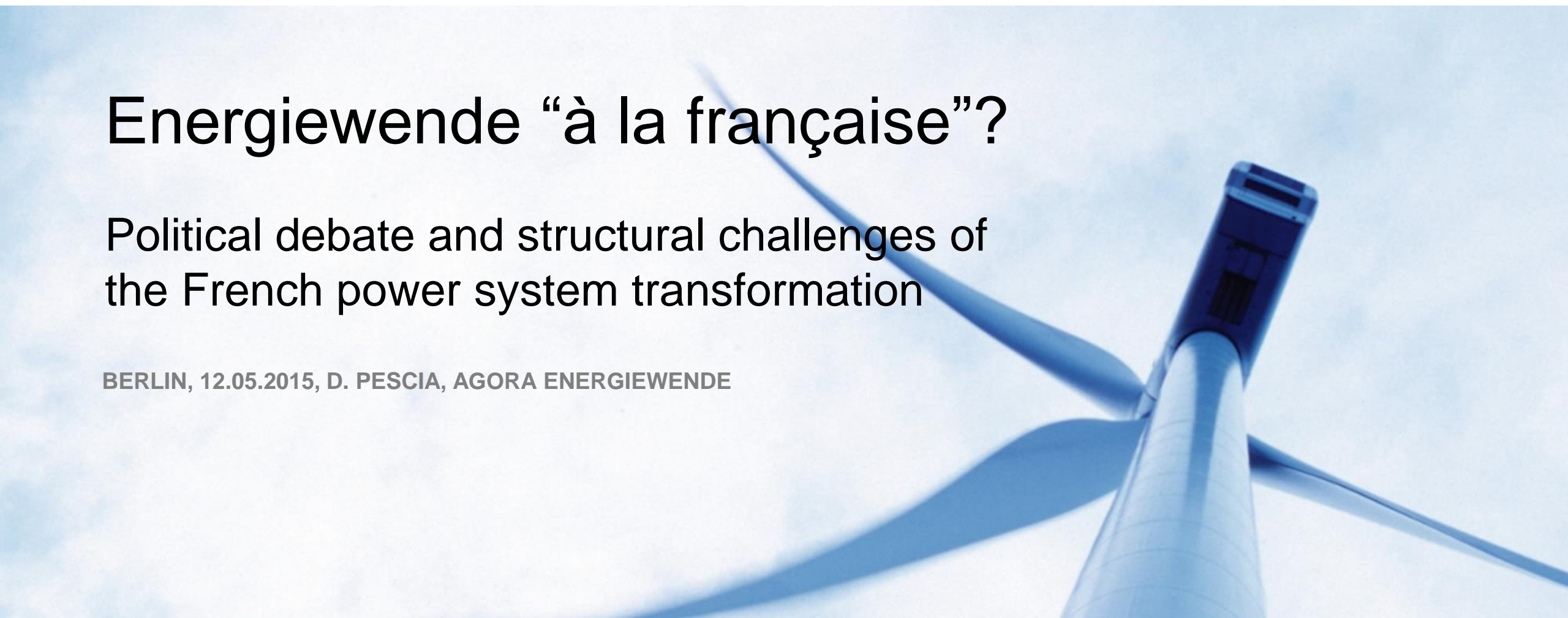


Energiewende “à la française”?

Political debate and structural challenges of
the French power system transformation

BERLIN, 12.05.2015, D. PESCIA, AGORA ENERGIEWENDE



Who we are

- Independent and non-partisan Think Tank, 18 Experts
- Project duration: 2012-2017 | Financed with 15 million Euro by the Mercator Foundation and the European Climate Foundation
- Mission: How do we make the *Energiewende* in Germany a success story?
- Analyzing, assessing, understanding, discussing, putting forward proposals

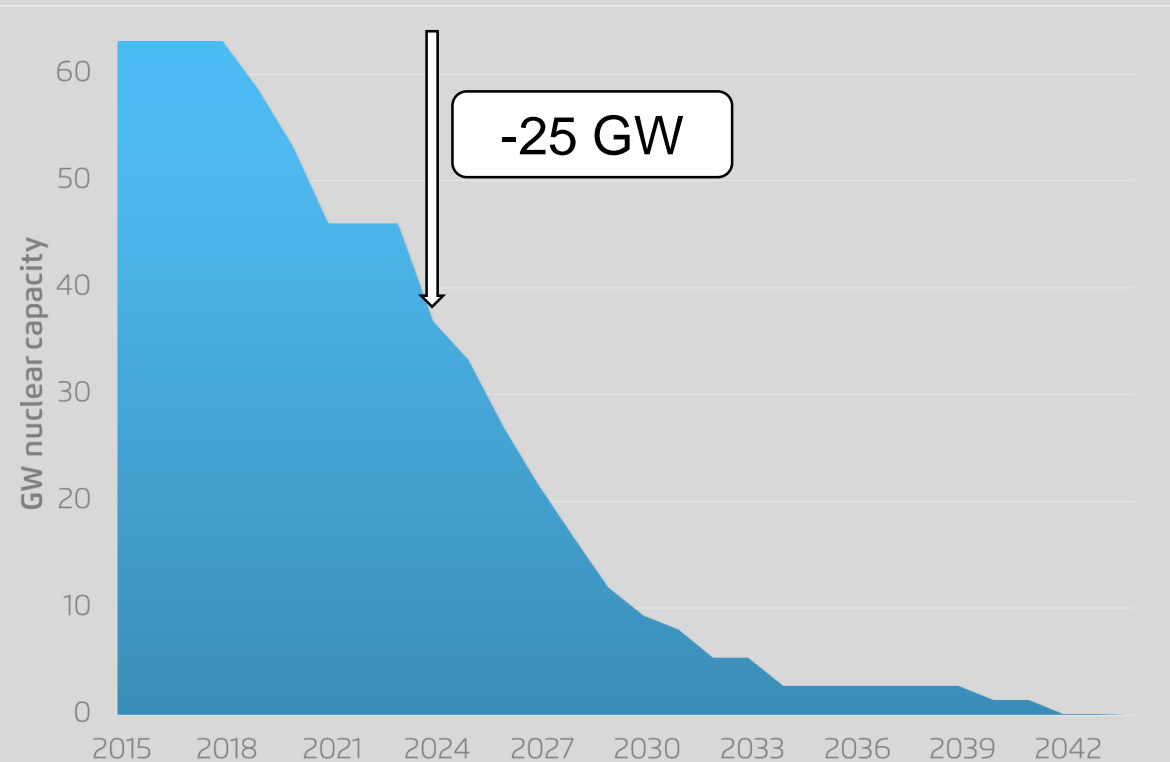


1. Structural challenges of the French power system and power market



The nuclear cliff : between 2018-2025, 25 GW nuclear capacities reach the end of their 40 years lifetime

End of 40 years cycle of French nuclear capacities (remaining nuclear capacity GW)



EDF

Nuclear power covers about 75% of the French power production (63 GW)

Important investment decisions in the context of an aging nuclear fleet.

Controversy about the costs of the retrofit program ("Grand carénage").

- 90 Mds €₂₀₁₀ for 2011-2033 according to Court of Auditors (i.e. 1425 €/kW) .

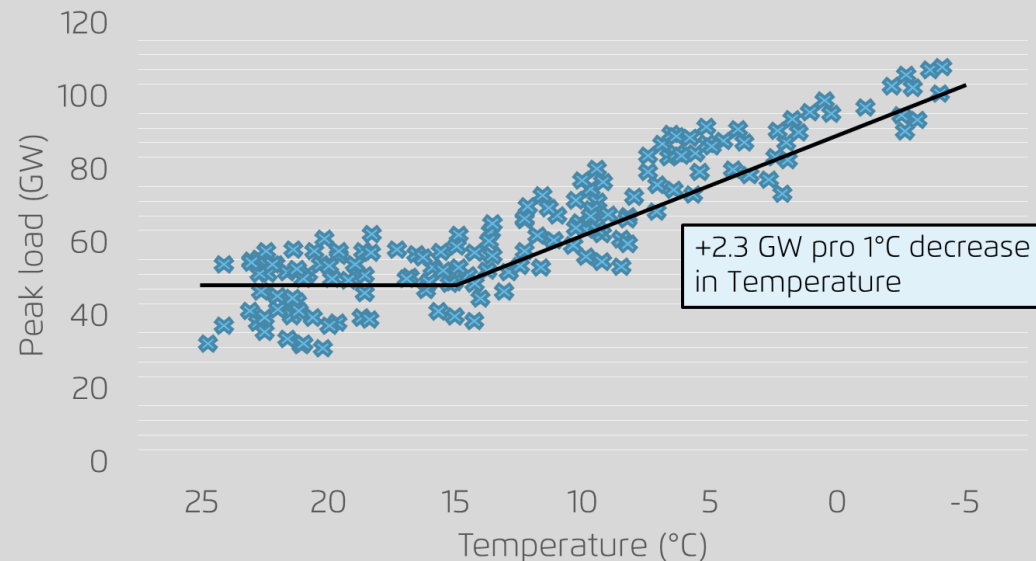
- between 1400 and 3700 €/kW according to WISE (depending on the security standard).

The lifetime extension **contributes to increase the generation cost** of the French nuclear power (evaluated at about 60 €₂₀₁₃/MWh¹)

¹ current economic cost (equivalent, while slightly different, to the LCOE methodology)

High sensitivity of electricity demand to temperature: rationale for the introduction of a capacity mechanism

Peak load (GW) in France as a function of decreasing temperature



RTE

Concerns about future adequacy problems since 2008 : 1 °C decrease in T° increases peak load by +2.3 GW (electric heating)

About 6 years to develop and implement the capacity mechanism. Adoption of CRM mechanism in 2015; first delivery year 2016

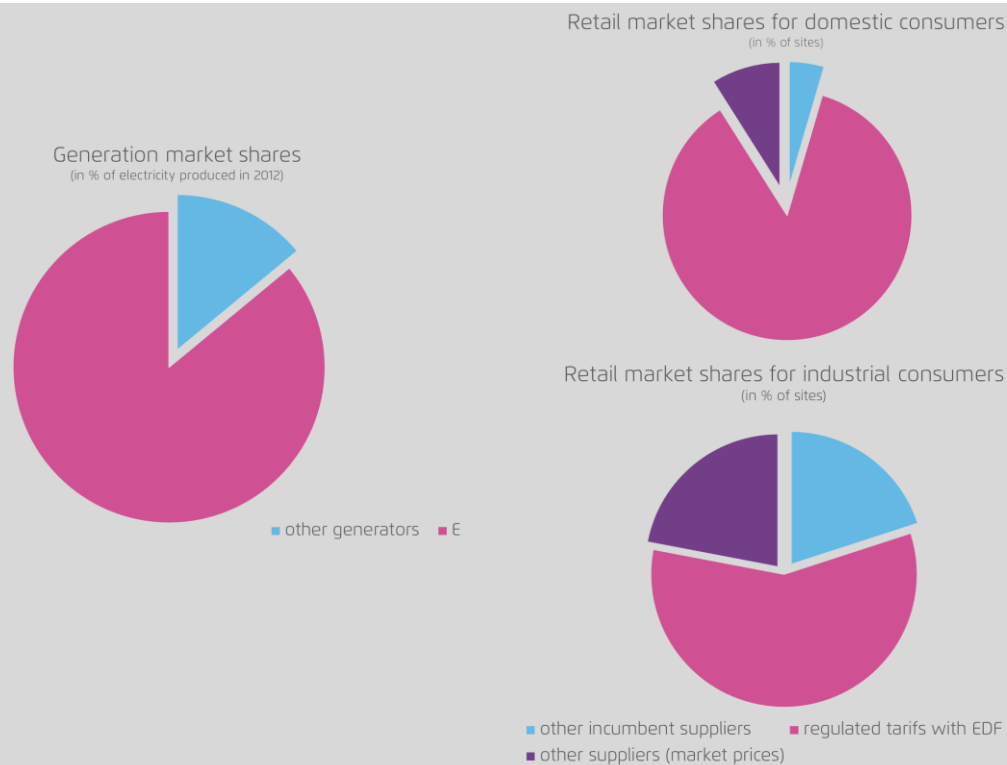
Main features of the mechanism

- > incentive to trigger DSM potential
- > decentralized mechanisms
- > technology neutral
- > interconnection taken into account implicitly

Consultation on cross-border participation (to move from implicit to explicit consideration)

A highly concentrated power market : a set of reforms is supposed to increase competition on the retail market

Market shares of EDF and competitors in 2012 (generation and retail)



EDF dominates all market segments. Most consumers still benefit from regulated tariffs.

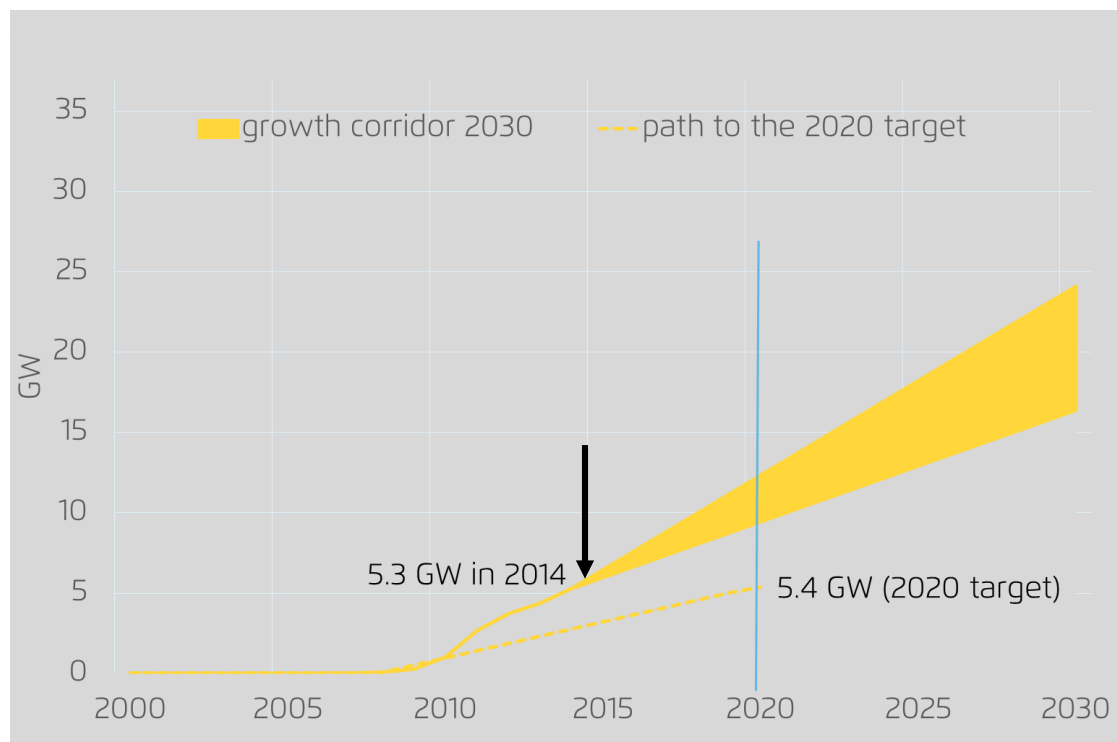
France implemented a power market reform in 2010, in response to two investigations of the Commission :

- End of regulated tariffs for industrial consumers in 2016 (regulated tariffs maintained for households)
- Regulated access to EDF's production (100 TWh) for suppliers at regulated tariff (42€/MWh)

Little use of the mechanism (only 15 TWh bought for 1st semester 15) : access price too high for new entrants (given the low wholesale prices) and too low for EDF (reinvestments for retro-fit)

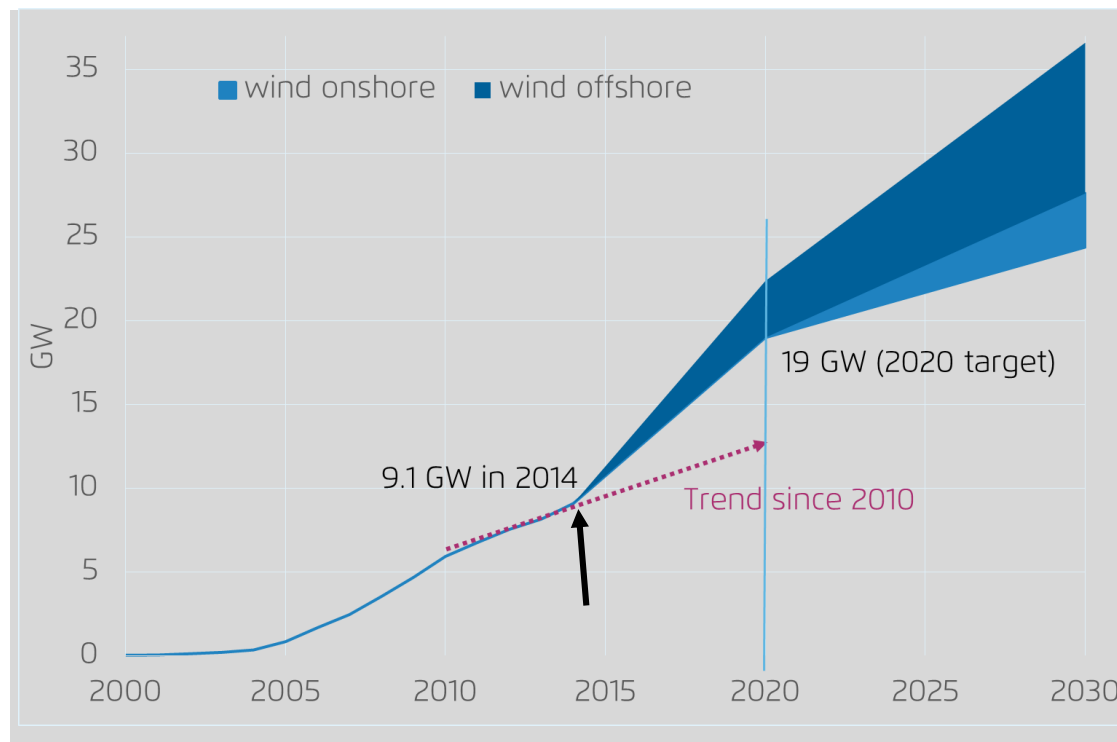
EU commitments for renewable energies : France is likely to miss its 2020 targets – unknown beyond

Installed PV capacities (GW) in France : historic (2000-2014) and potential development (up to 2030)



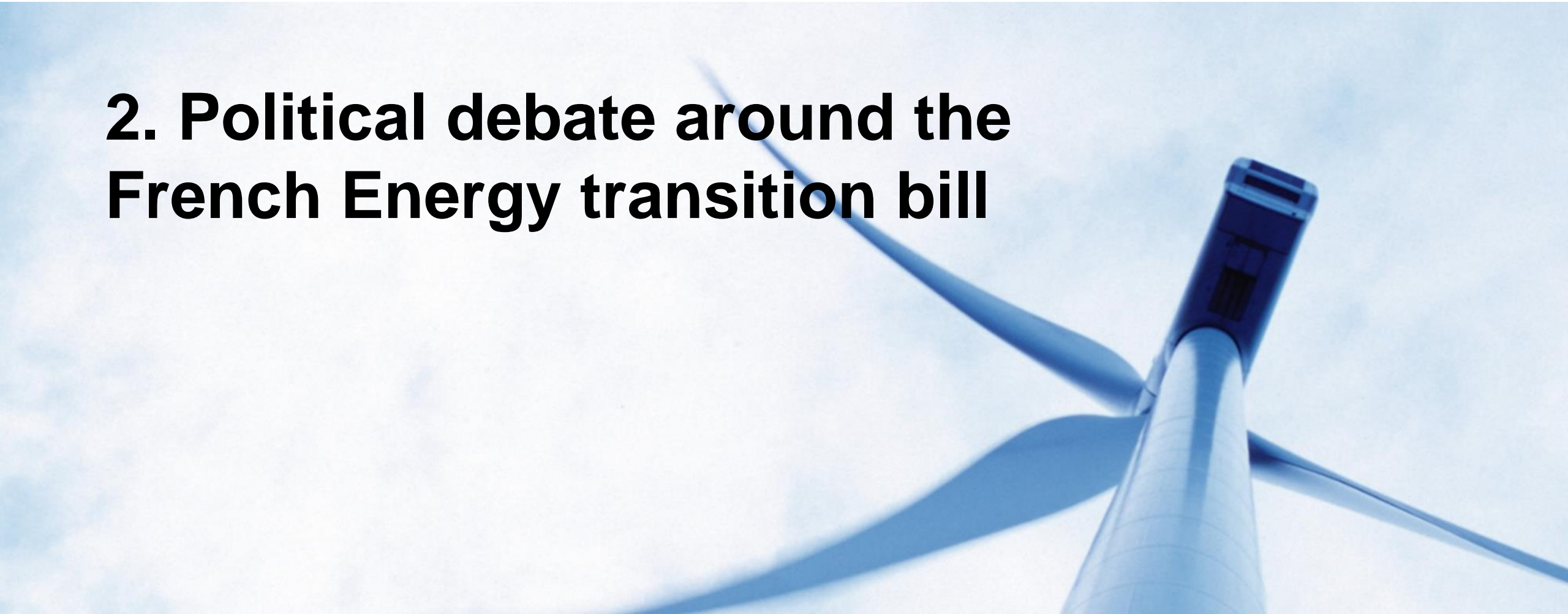
DGEC (2014)

Installed wind capacities (GW) in France : historic (2000-2014) and potential development (up to 2030)

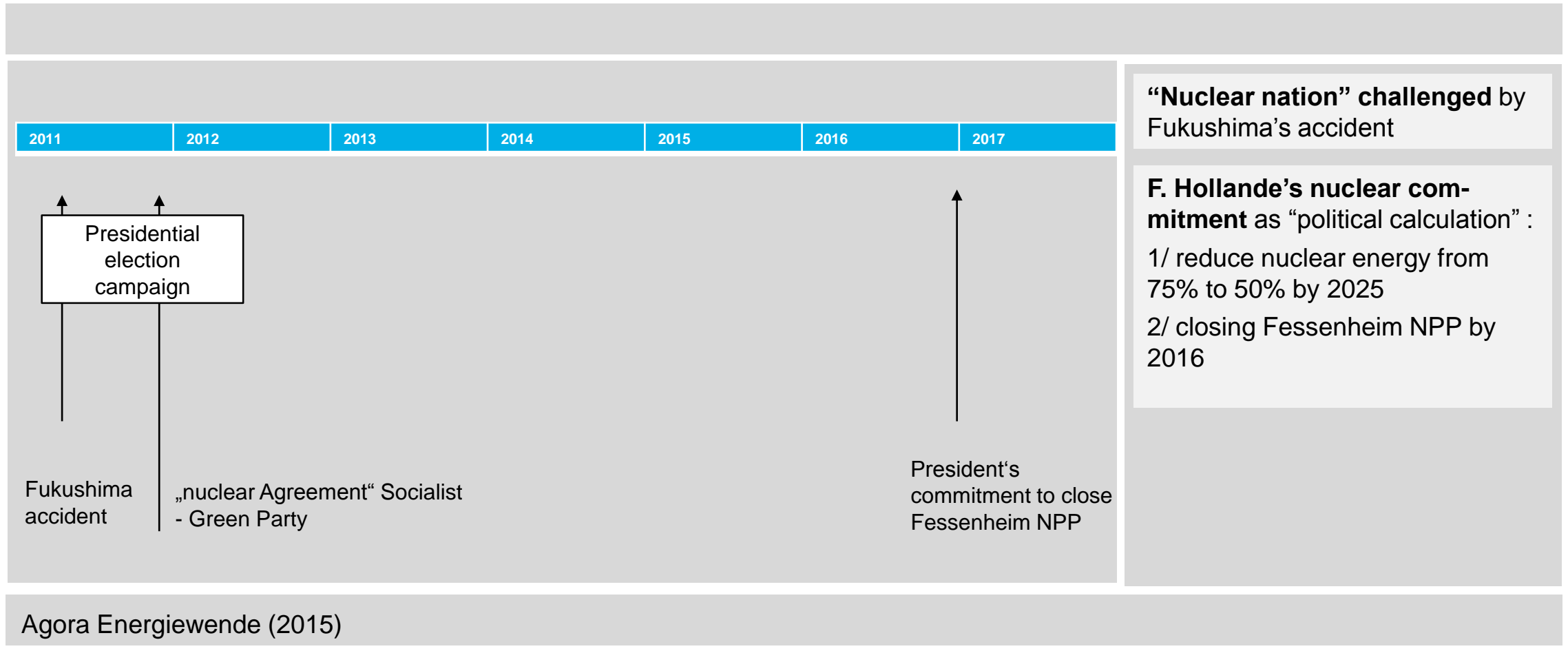


DGEC (2014)

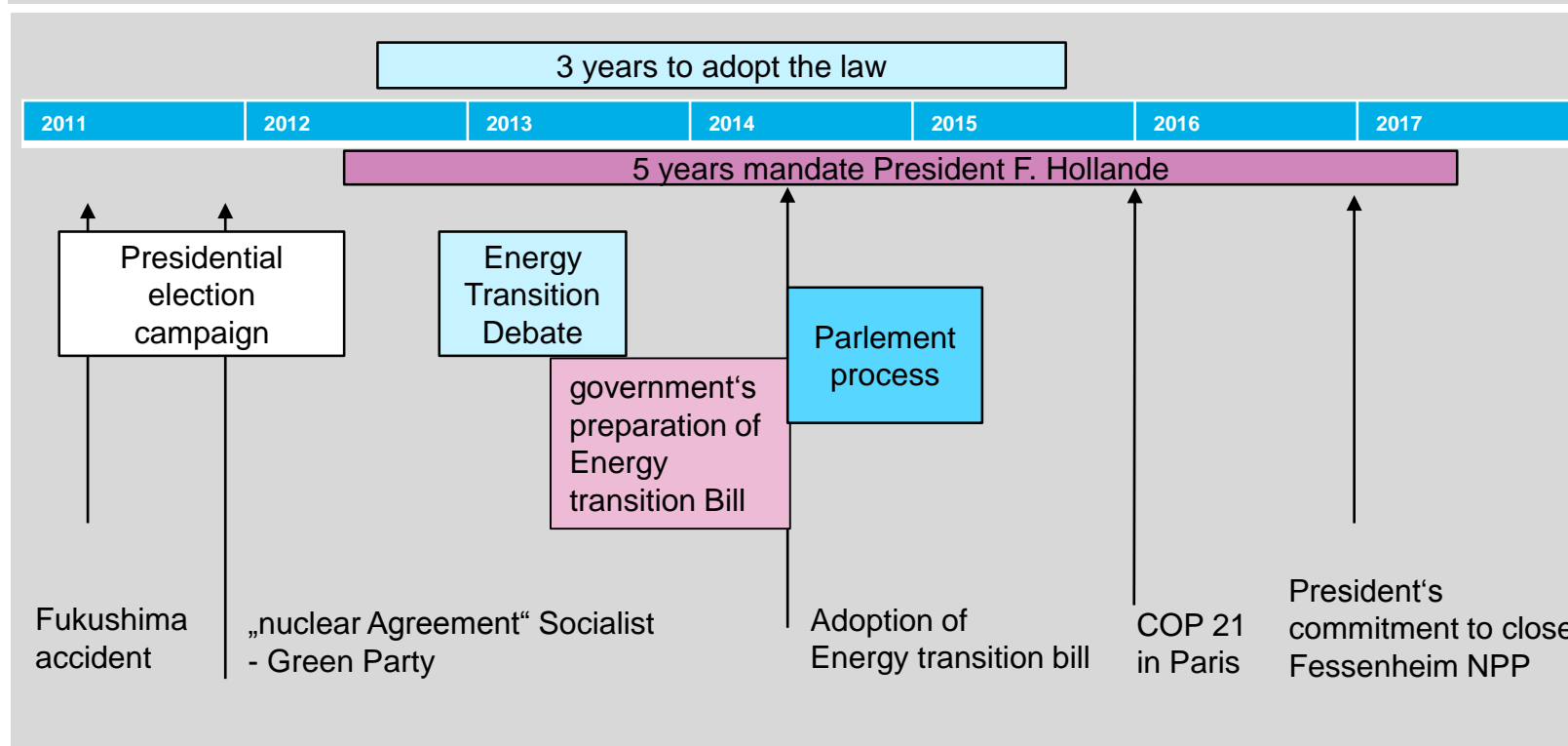
2. Political debate around the French Energy transition bill



The French energy transition bill – a highly political and controversial context – Act I



The French energy transition bill – a highly political and controversial context – Act II



“Nuclear nation” challenged by Fukushima’s accident

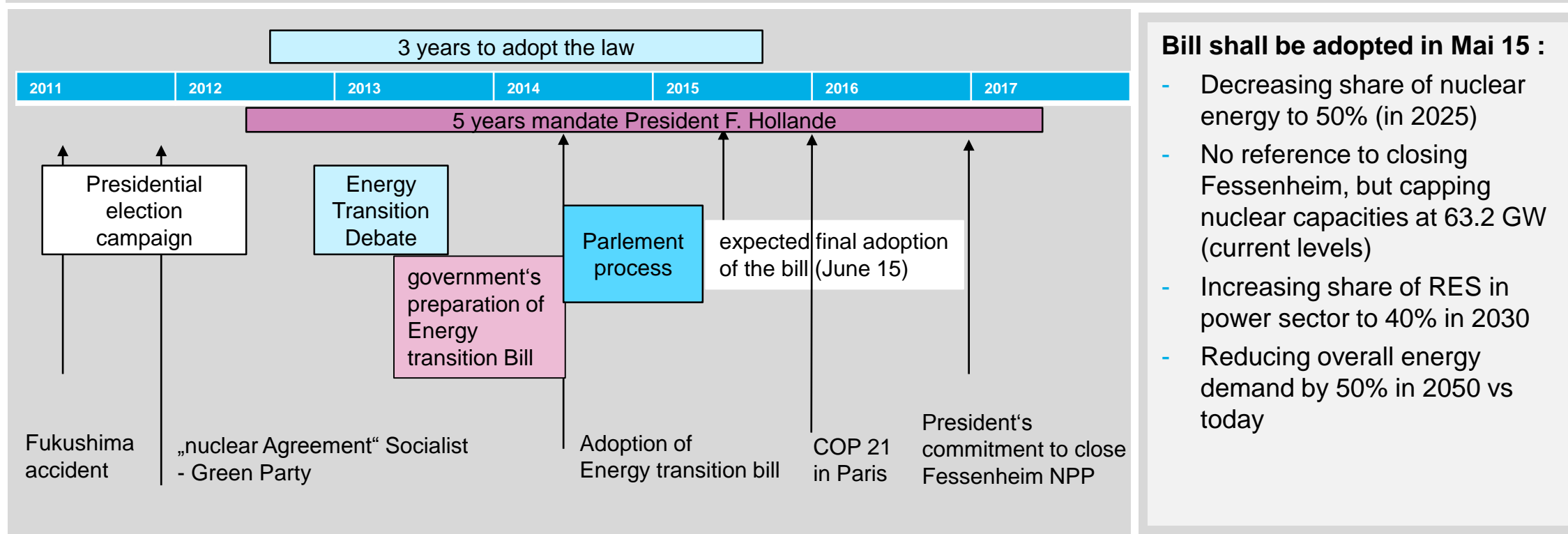
F. Hollande’s nuclear commitment as “political calculation” :

- 1/ reduce nuclear energy from 75% to 50% by 2025
- 2/ closing Fessenheim NPP by 2016

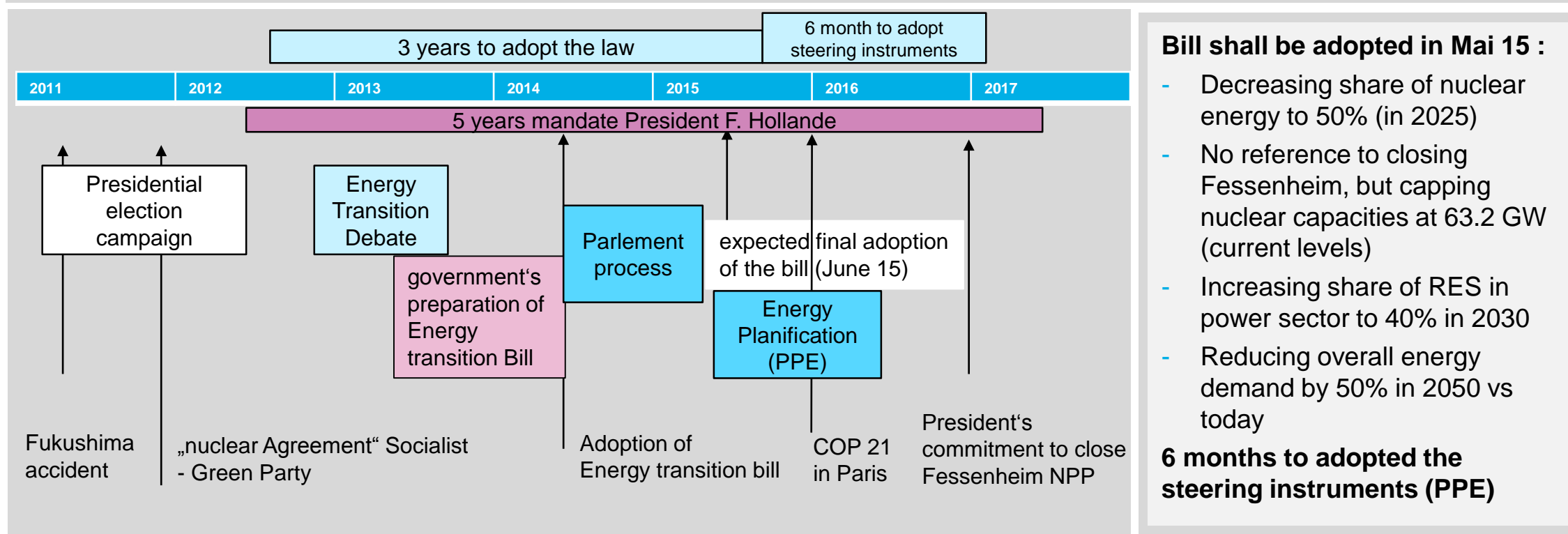
Long, controversial and tedious political debate

Social and economics focus of the energy debate

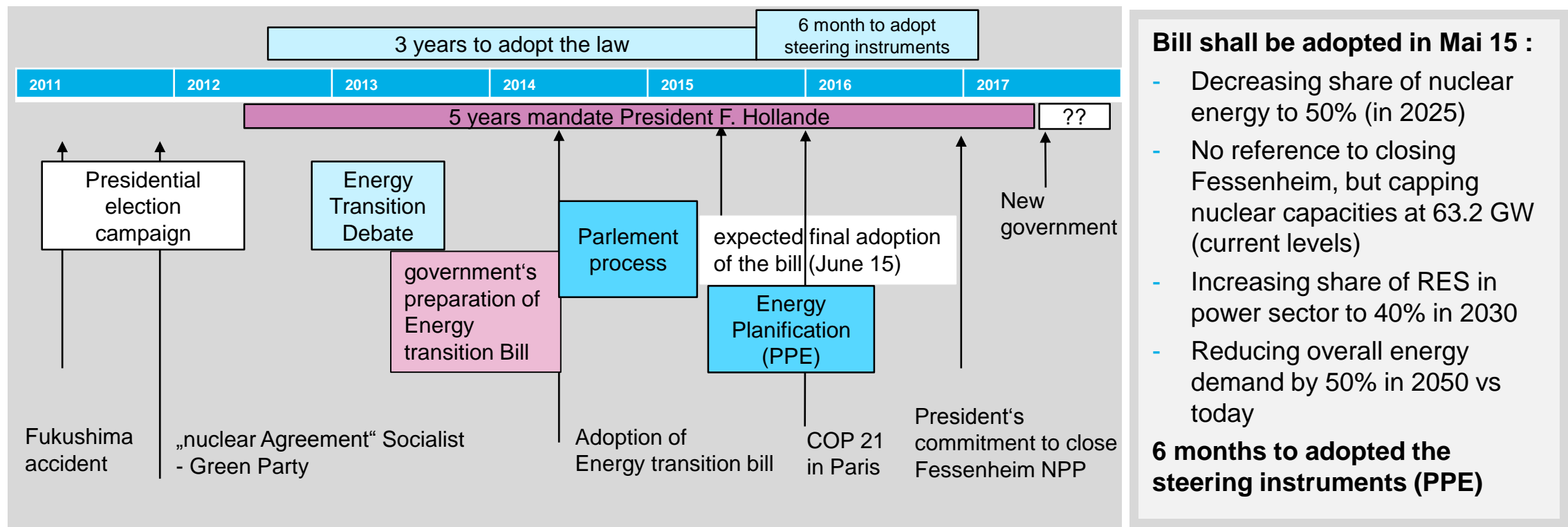
The French energy transition bill – a highly political and controversial context – Act III



The French energy transition bill – a highly political and controversial context – Act IV



The French energy transition bill – a highly political and controversial context – A new theatre play in 2017?

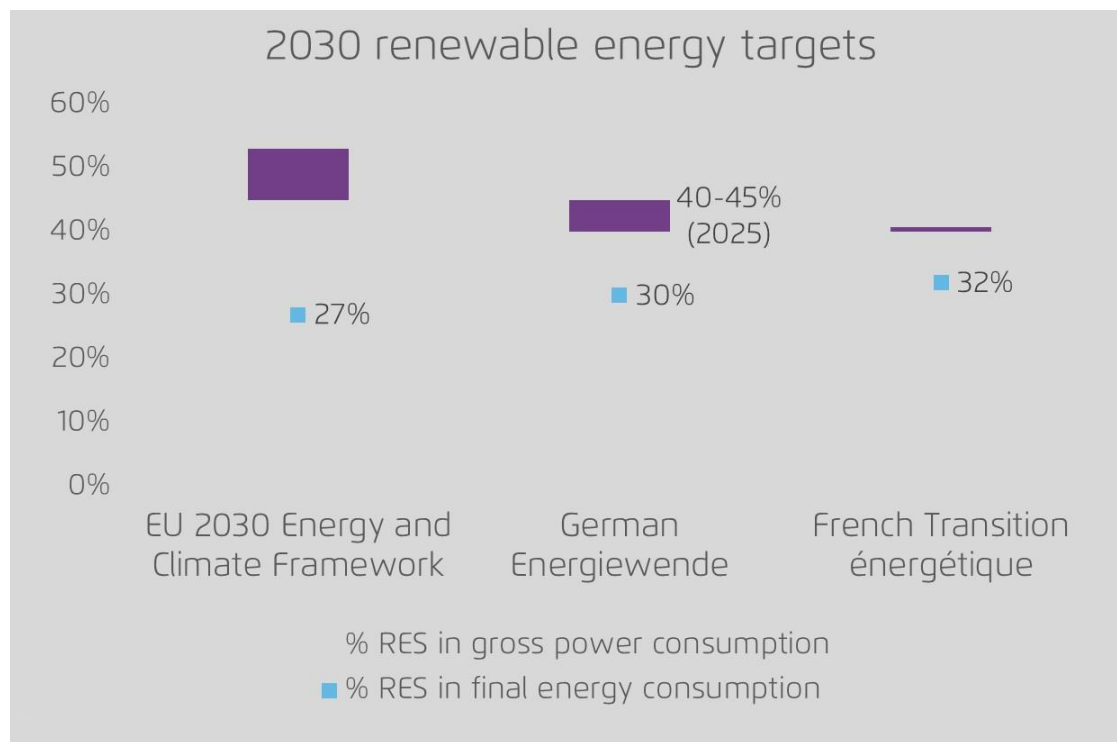


3. The mix diversification of the French power system



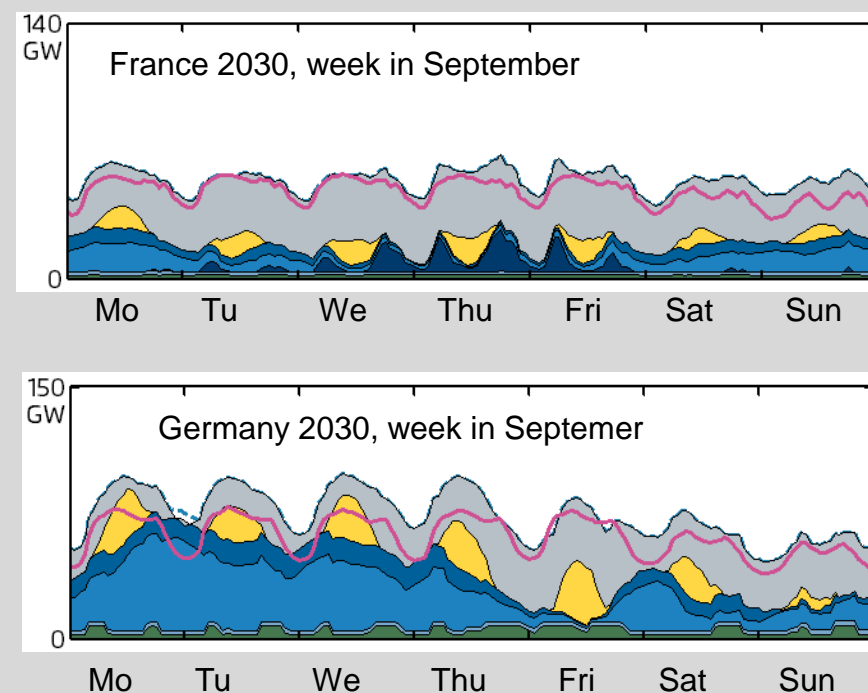
The French power sector transformation targets lead to more convergence with Germany

French renewable targets in the power sector are in line with German and European targets



EU Commission (2014), French and Germany energy strategies

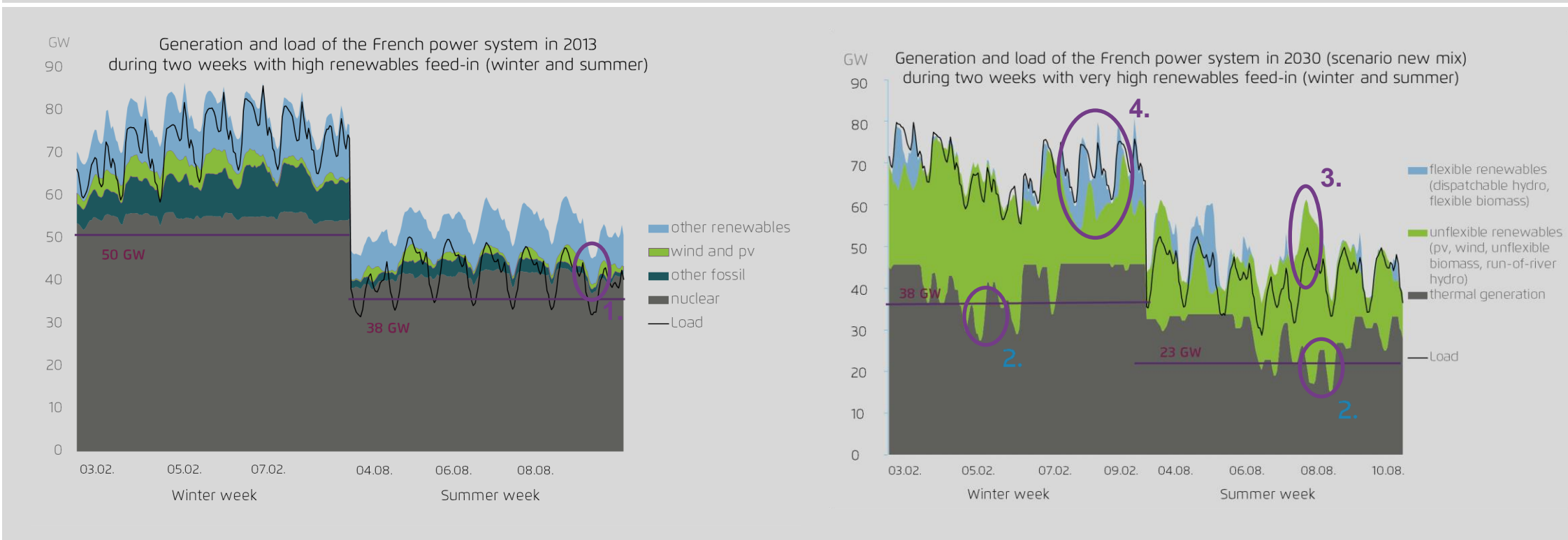
Representative week in 2030 for the French and German power mix



Agora Energiewende / Fraunhofer IWES (2015)

The road from 2015 to 2030 – what future for the French power mix diversification strategy?

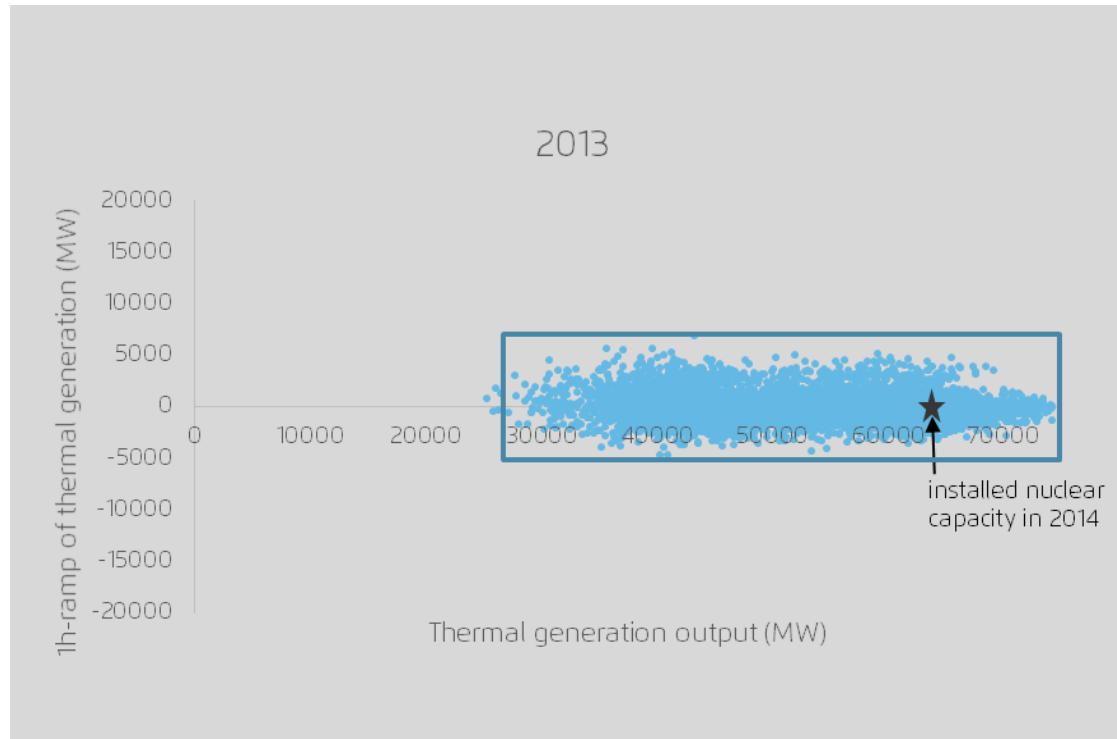
Generation and consumption in France in 2013 and 2030 during two « extreme » weeks with high share of v-RES



Agora Energiewende / Fraunhofer IWES (2015), based on long-term forecasts of RTE

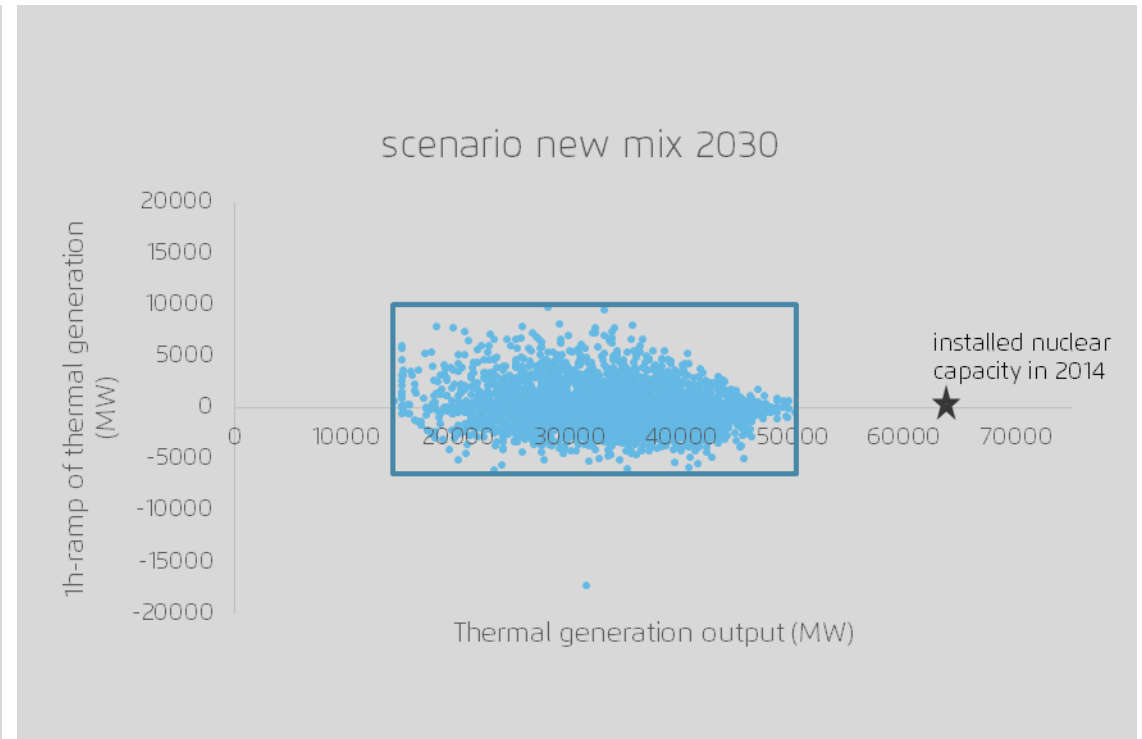
Incorporating 40% renewables in the French power system implies some rescaling of the nuclear fleet and (moderate) changes in its short-term operation

Thermal generation ramping (1-hour ramps) as a function of the generation output in 2013



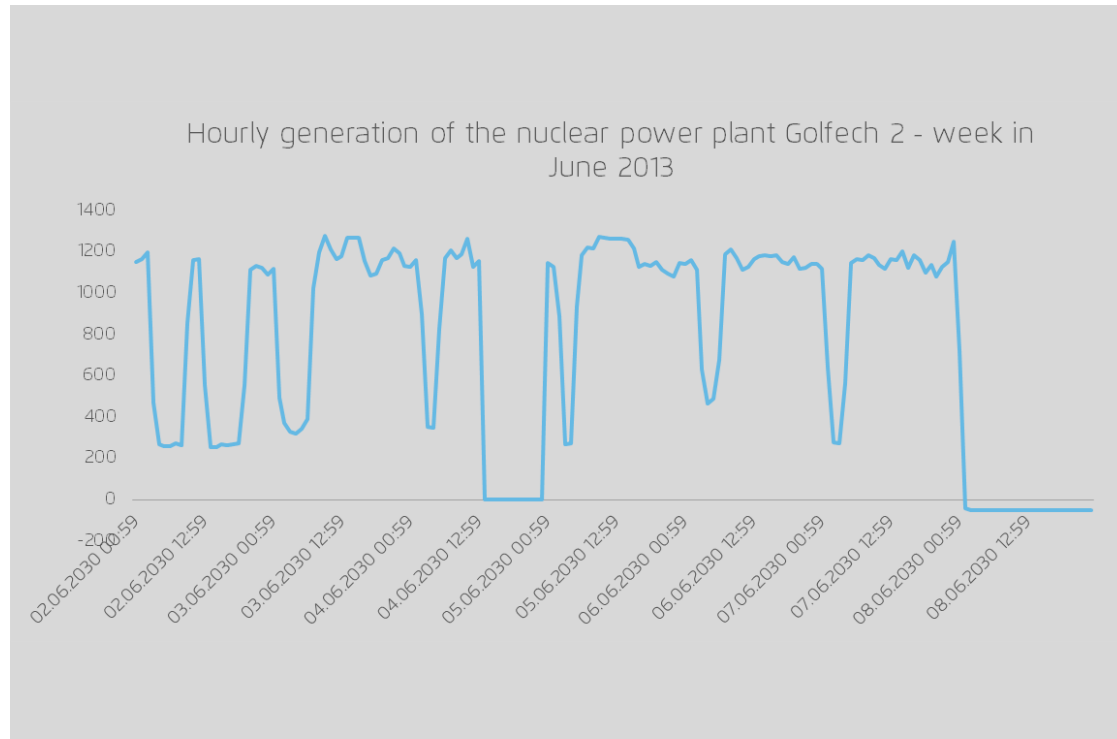
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Thermal generation ramping (1-hour ramps) as a function of the generation output in 2030

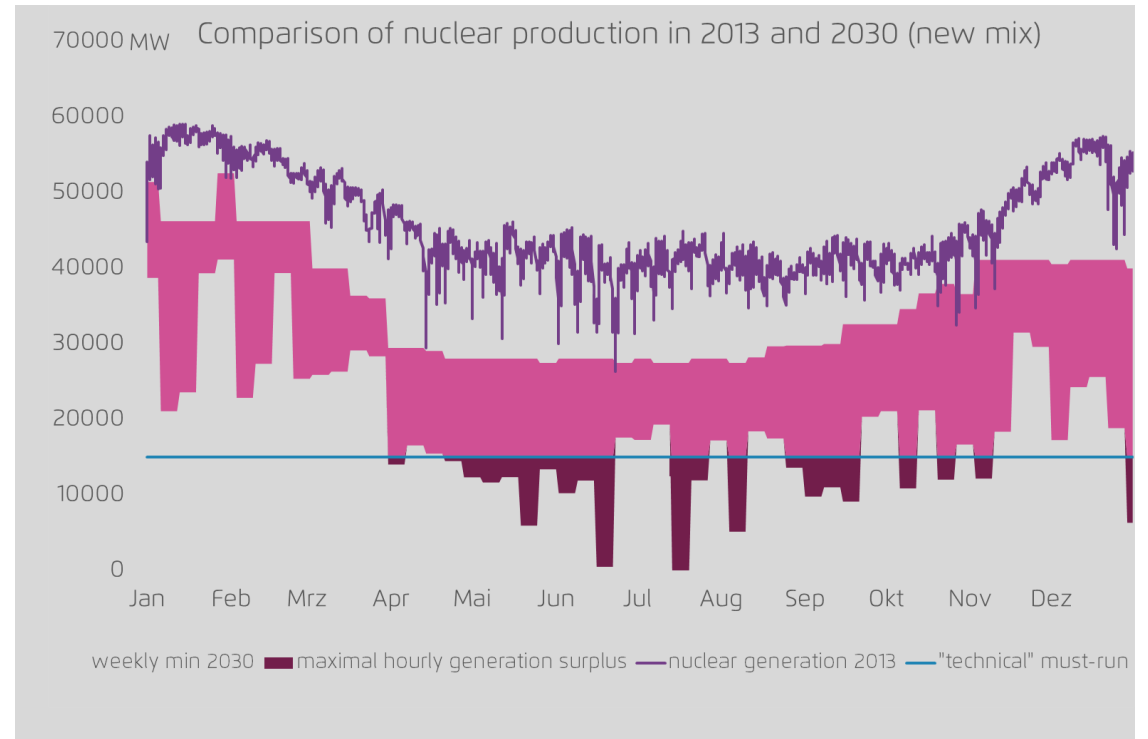


Agora Energiewende / Fraunhofer IWES (2015)

The French nuclear fleet can respond (technically) in part to increasing flexibility needs but a reoptimization of its operation is crucial to incorporate high share of RES



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More information and studies available at our website

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Thank you for your attention!

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