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Transition of the French electricity system: what should be the strategy?

Between postponed objectives and the urgency to prepare for the future

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The challenges of transforming the French electricity system attracted the media spotlight when the Government announced that it had postponed to beyond 2025 the implementation of a target to reduce the

share of nuclear energy to 50%. Indeed, this decision undermines an objective enshrined in the law and increases uncertainty for operators. However, the announcement is understandable from an economic and climate point of view, given the delay in reducing nuclear capacity and the development of renewable energies, as illustrated by the latest prospective scenarios published by RTE. In this context, the 2018 Multiannual Energy Plan will have to face the serious challenge of building a complete and coherent roadmap around credible pathways for all technological, nuclear and renewable sectors, otherwise the risks of inconsistent development and stranded costs will only increase.

The objective of reducing the share of nuclear energy to 50% of electricity production was formulated for the first time in 2011, and was then formally enshrined in the 2015 Energy Transition for Green Growth Act. The intention was for the 2016 Multiannual Energy Plan (programmation pluriannuelle de l'énergie - PPE) to set out for the first time the strategy to achieve the legal objective. However, the plan only called for a modest reduction in nuclear output—between 10 and 65 TWh by 2023—which would put the electricity sector on a trajectory that would fall very short of the 2025 target, while any attempt to reach the target would require sudden and expensive transformations in the two-year gap.

Based on the desire to limit CO₂ emissions and ensure security of the electricity supply, the Government's decision to postpone the 2025 deadline may therefore appear logical in view of the delays, in terms of both reducing the supply of nuclear energy—no reactor shutdowns have yet been initiated—and of ramping up alternative production—the pace of the development of renewable energies remains insufficient. Consequently, keeping the 2025 target meant offsetting nuclear production with the increased use of gas. At a time when France is asserting itself as the “guardian” of the Paris Climate Agreement, this would incur an increase of 20 MtCO₂ in 2025, according to the [estimates of the network operator RTE](#).^[1]

In the longer term, France would face a difficult alternative: to shut down capacities a few years after they had been put online, which would raise the issue of the economic and industrial relevance of this strategy; or undergo a technological “lock-in” that would have a lasting impact on the CO₂ emissions balance of French electricity production.

On this point, the Minister Nicolas Hulot is therefore correct, and the deadline of 2025 seems unsustainable in view of the lack of anticipation and the implementation delay, as also illustrated in an IDDRI study published at the beginning of the year:

[Study](#)

[February 2017](#)

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However, the challenge ahead is not so much related to the date, but more to the need for France to be in a condition where it can successfully implement the changes in electricity production that have been enshrined in the Energy Transition for Green Growth Act (TECV). Beyond its energy-climate component, it should be noted that the

nuclear objective is part of a risk diversification strategy, in view of the persistent uncertainty about the possibility of extending all existing reactors, whether for reasons of safety or economic viability. The Nuclear Safety Authority (ASN) has already announced that its advice on the extension of reactors beyond 40 years will not be published until 2021. However, this postponement cannot allow the State to back away from its responsibility to define a strategy that takes into account all of the issues and risks. In its prospective work published in early 2017, IDDRI had studied four exploratory scenarios.

- The first described, similarly to RTE's analysis, the challenges associated with the management of the 2025 crossroads, while the other three looked at alternative strategies;
- To reduce electricity exports while accelerating the development of renewable energies;
- To reduce the constraints relating to the reduction of nuclear power by redefining the targets for renewables and nuclear with respect to domestic consumption, rather than total production, and exporting surplus production;
- Delay meeting the 50% nuclear objective until 2030, to smooth the transformation process and thus allow more time for renewables to compensate for the decrease in nuclear production.

All these options must be considered in the context of a detailed discussion, knowing that they are not mutually exclusive and that the combination of various levers appears preferable. In particular, the question of the long-term export balance must also be raised: that in the absence of trade-offs a de facto balance between the reinvestment in the totality of existing nuclear capacities, and the achievement of the renewable objectives, would be an economically risky strategy, which would imply strong growth in net electricity exports. This hypothesis remains subject to important uncertainties. Technically, it involves the realization of the necessary interconnections with neighbouring countries. Economically, the viability of these exports remains uncertain in view of the current price trends on wholesale markets and taking into account the risk that this additional production could reinforce the excess supply. IDDRI, in collaboration with Agora Energiewende, will publish a study in the coming weeks that assesses the cross-effects of the French and German strategies on their nuclear and coal fleets, showing the value of a regional and European dialogue on these issues.

The year 2018 promises to be decisive for the French electricity system, which is entering into a decade of major changes. It is time to go beyond the sterile discussion about the objectives and for France to be clear about which investment strategy it seeks to implement.

Report

March 2018

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To prepare for these changes, it will be necessary to make good use of the energy-climate governance tools inherited from the TECV Act by proposing a clear and coherent trajectory for the electricity system. However, the sudden government decision undermines this governance framework without making any substantiated proposals on the possible alternative methods. In this uncertain context, the PPE will nevertheless have to meet the challenge of building a comprehensive and coherent roadmap regarding credible trajectories for the electricity demand and the combined supply of nuclear, renewable and thermal generation, as well as for the network infrastructure and means of load management. The alternative of an uncontrolled and unchecked transition is undesirable for both the actors of the sector who would have to manage increased economic and industrial risks, and for citizens who would ultimately

pay the bill.

[1] RTE estimates that 22 nuclear reactors, out of the existing 58, would need to be closed to achieve the 50% nuclear target by 2025.

CLIMATE