

# How can we ensure a consistent energy transition, in France?



**David  
FRABOULET**

Physicist/engineer at CEA

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## Advocacy for systemic energy analysis

Energy availability and economic prosperity mostly come together, yet, this coupling should not jeopardize our environment. Any energy scenario evolution should be checked against exhaustive systemic analysis. In so doing, energy availability with precise specific constraints should be ensured, and the overall ecologic and climatic impact evaluated. The quantitative link between various options and their consequences should be carefully computed, at comparable service, cost, and environmental impact. Pragmatically, the aim would not necessarily be to completely ban fossil energy usage at short term, or to immediately stop greenhouse gas emission. We should rather strive towards the “best” short and medium term compromise, trying and minimizing the impact on various criteria still to define. These should include, among others: environment, strategy, social, technological and economic feasibility.

An energy system involves fluxes (chemical fuels, electricity, heat ...) linking primary energy sources (coal, oil, natural gas, nuclear power, wind, solar, biomass, waste...) with final energy consumption. This aims at satisfying practical needs: heat (for ovens, boilers), mechanical power (with motors), lighting, electrolysis and reduction of metals ...

The balance between production and consumption can be optimized with “flexibilities” such as storage, consumption monitoring, and at the level of one state, via exchanges with other states. This is true of any energy network, at any scale, yet, the electric network is a very didactic example.

Coupling between the fluxes cited above are already in place. For instance fuels are used to produce heat and/or electricity, electricity is used to produce heat or mechanical force ... In the future such coupling will have to be more closely optimized, in order to gain on overall flexibility and efficiency. Useless conversion would have to be avoided, and global energy consumption will have to be globally and efficiently monitored, notably using the opportunity of new digital tools.

The presentation will try and give some hints along these lines, taking advantage of several past working-groups, in France and elsewhere. More questions will be asked than answers given.



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