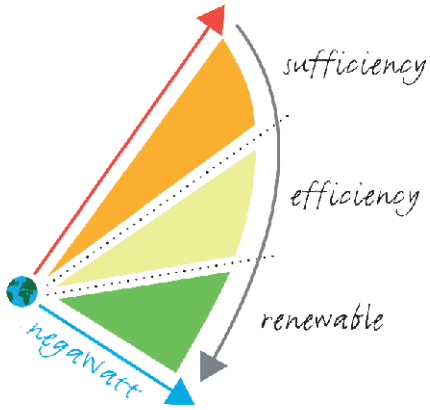
The négaWatt energy scenario

Achieving a successful energy transition for France

Giving the inevitable rise of energy costs, the foreseeable depletion of fossil and nuclear fuels, the climate emergency, and the multiple environmental impacts of energy, **we have to swiftly shift to a new energy system based on sufficiency, efficiency, and renewable energy sources.**

With its energy transition scenario, the négaWatt Association offers the most elaborate alternative energy outlook for France, providing a sustainable and implementable pathway for the next 40 years. This scenario has been developed by independent energy experts and practitioners acting on a personal basis.



négaWatt approach: energy sufficiency, energy efficiency, and renewable energy sources.

The core principles of the négaWatt scenario

- A systematic assessment of **"negaWatt sources"** (energy saving potentials) in all sectors – i.e. any use of energy that could be avoided through sufficiency and efficiency actions; followed by a preference given to renewable energy sources (sun, wind, water, biomass), instead of fossil and nuclear fuels.
- No gamble on hypothetic technological breakthrough, but rather the implementation of effective and mature solutions whose technical and economic feasibility has been demonstrated even if they are not all currently massively deployed.
- An overall objective that goes beyond fighting climate change, because decarbonising the energy is not enough ! We seek to **reduce all risks and impacts related to our energy system:** water, natural resources, as well as land use aspects that have also been taken into account.

The 2011-2050 négaWatt scenario proposes an ambitious yet realistic pathway, consistent with the principle of sustainable development: leaving benefits and incomes to future generations, instead of burdens and debts.

More about the négaWatt Association: **www.negawatt.org/en-p149.html**

From energy uses to resources

Before even addressing energy consumption issues, the négaWatt scenario first investigates **our energy service needs and the means to reduce them.** To do so, it identifies three main service needs:

HEAT:

that includes heating and cooling in residential and tertiary buildings, domestic hot water, cooking, as well as the heat required by industrial processes.

MOBILITY:

namely all type of movements of people, raw materials, and goods.

SPECIFIC ELECTRICITY NEEDS:

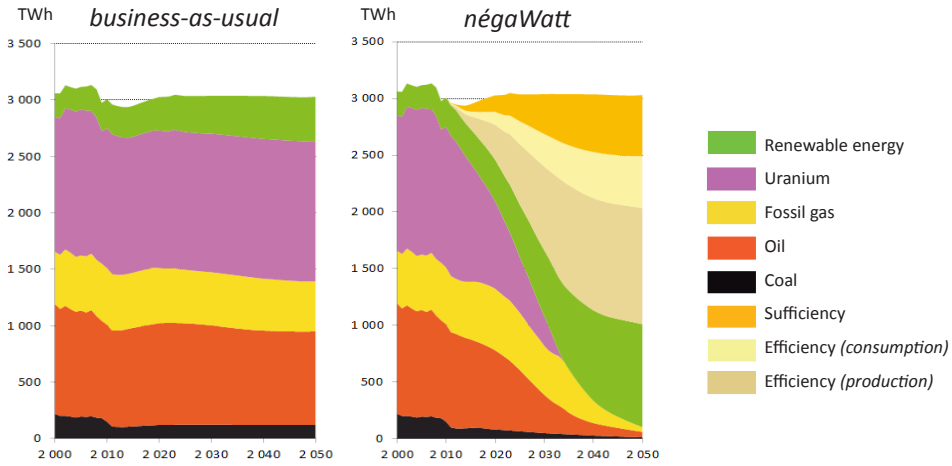
that relate to lighting, appliances, computing, information technologies, and motors used in industries and buildings.

These service needs are analysed **by sectors** (households, tertiary, transports, industry, agriculture) to quantify year by year **the necessary energy consumption** to satisfy them, after having implemented energy sufficiency and efficiency measures.

Resulting energy consumption levels are then **compared with possible supply from renewable energy sources** on the French territory, taking into account the development potential of each source. For electricity, **the development of renewable energies is considered with a view to gradually shut down the 58 national nuclear reactors**, whose lifetime does not exceed 40 years in the scenario for safety reasons.

Fossil fuels, notably natural gas, are used **in a transition phase** to ensure the demand/supply balance.

Comparison between primary energy needs in the business-as-usual scenario versus négaWatt scenario



The 2011-2050 négaWatt scenario
in 10 key points

The négaWatt approach begins with energy sufficiency, i.e. bringing more intelligence in individual and collective behaviours to reduce energy demand. **1**

Energy sufficiency does not mean deprivation, but stopping energy waste that does not bring any additional comfort.

Proactive energy efficiency policies, that deliver together with sufficiency a two third cut in French primary energy needs by 2050. **2**

Energy saving potentials have been assessed for each use and sector: efficient building renovations, deployment of lower energy-using appliances, low-consumption vehicles, etc.

Still a high level of satisfaction of heating, mobility, and specific electricity service needs. **3**

By 2050, people can still enjoy the same level of heated space as today, they can move and use appliances, even potential new uses have been anticipated. The négaWatt scenario does in no way mean regression.

Renewable energy sources as the preferred supply option, enabling them to cover close to 90% of French energy demand by 2050. **4**

Almost half of them are related to biomass (wood, agricultural waste, biogas, etc.), while wind energy and photovoltaics supply the largest part of electricity.

A constant balance between demand and supply, especially for electricity where the need for an instantaneous balance has been modelled on an hourly basis until 2050, through a coordinated management of gas, electricity, and heat networks. **5**

The variability of wind and solar energy supply at the level of a production site – that can now be well anticipated – is partly compensated by the wide geographical distribution of installations across the French territory and the existence of three different wind regimes (oceanic, continental, and Mediterranean). Renewable electricity surplus is converted into methane to supply vehicles that have dropped out oil-based fuels.

6

A way of anticipating the end of easy fossil fuels (oil, gas, coal). Their use is progressively limited to a few specific sectors (petrochemistry, industrial raw materials, aviation).

From more than 70% in 2011, the share of fossil fuels in the French energy consumption can decrease close to zero in less than four decades, putting an end to the current strong dependency on foreign imports.

7

A nearly fully decarbonised energy system, despite a properly controlled and scheduled end of nuclear electricity production through the shutdown of current reactors before they turn 40 years.

The phasing-out of nuclear energy is compensated simultaneously by the increase of renewable energy production and the implementation of sufficiency and efficiency actions. This still allows to substantially increase the share of energy services based on electricity by 2050. Such an approach leads to a complete termination of nuclear energy in France between 2030 and 2035.

8

A spectacular reduction of greenhouse gas emissions, responsible for climate change.

Compared to 2010, the amount of CO_2 released in the atmosphere by France is halved by 2030, and cut by a factor 16 by 2050.

9

A balanced and sustainable land-use (consistent with the Afterres scenario of Solagro).

The négaWatt approach ensures a fair land-use, under good ecological and economic conditions : priority is still given to food production; afterwards, bio-sourced materials (for construction, thermal insulators, textiles, etc.), and only then energy needs (through biomass).

This is possible through evolutions in agricultural practices (agroforestry, integrated agriculture, organic farming, etc.) and food diets.

10

A country progressing towards energy autonomy and democracy, by giving a central role to local territories and their stakeholders, and creating hundreds of thousands of sustainable jobs in thermal renovation, renewable energies, and new means of public transport.

All these sectors are job intensive and cannot be off-shored. They will be funded by the progressive reduction of oil and gas imports, that today represent a € 70 billion bill per year in France.

More information on négaWatt:
www.negawatt.org/en-p149.html

Mythbuster on the energy transition:
www.decrypterlenergie.org