ASSOCIATION
négaWatt

The energy transition at the heart of a societal transition

Overview of the 2022 négaWatt scenario

Climate, resources, biodiversity: we can all make a difference! The négaWatt scenario shows a pathway to guide the action in France, above all by relying on more sufficiency in our lifestyles.

www.negawatt.org

TOWARDS A MORE SUSTAINABLE AND FAIRER SOCIETY

The négaWatt scenario builds on an overall sustainability approach. It aims at tackling the energy and climate challenges, while leading to a more sustainable, equitable, and resilient society in France. It also addresses the issues of biodiversity loss, fuel poverty, air pollution, etc.

Through its systemic approach, this scenario fully contributes to the 17 Sustainable Development Goals set by the United Nations. This framework holds limits, yet it provides a relevant basis to consider the variety of social, economic, and environmental challenges relating to the energy transition.

The UN Sustainable Development Goals

In the 2022 négaWatt scenario

The overall environmental footprint of the French consumption and production systems is substantially reduced: net greenhouse gas emissions fall to zero in 2050, the energy system is supplied at 96 % by renewable sources, the consumption of extracted materials has strongly decreased, biodiversity and water resources are better conserved.

New business models emerge: industrial strategies have substantially changed, heavy industries have transformed their processes to produce with much less emissions, renewable materials and energy sources have become largely competitive, generating benefits for local territories, hundreds of thousands long lasting jobs have been created, and the cut in energy consumption improves household purchasing power.

Social conditions improve: fuel poverty and vulnerability have been reduced, as well as inequalities to access resources and services, paving the way for a fairer and more secure living space for humanity.

The entire population benefits from a better health, thanks to less pollution in air, water, and soil, a healthier food and diet, and using more active mobility such as cycling and walking.

Although it focuses on France, the négaWatt scenario supports a global vision that could be implemented anywhere.

It relies on the principles of **greater equity** in access to energy and material resources, **fair burden sharing** between regions of the world, considering the **historical responsibilities** of western countries in the environmental degradation and social inequalities.

The assessment of French greenhouse gas emissions is not limited to those domestically generated, but also takes into account the those due to the **goods and services that are imported in the country** (footprint approach).

The French scenario will be part of a wider **European energy transition scenario**, currently in development with more than a dozen foreign partners and led by the négaWatt Association.

Climate change: it's still time to act

Impacts of climate change are already visible, including in France, and the objective of remaining below +1,5°C of global warming seems increasingly out of reach. Is it too late to act?

The answer is no. The Intergovernmental Panel on Climate Change (IPCC) has shown in its report published in the 2021 summer[1] that limiting global warming to +1,5°C was still possible under certain conditions, although very challenging.

"Each half-degree counts, each year counts, each decision counts"[2]. The climate urgency is a shared responsibility, everybody must unite forces, from the large international organisations to each one of us.

Building an energy scenario by starting upstream from the energy usages, as négaWatt does, allows to identify solutions and concrete actions that can be implemented to allow for tackling climate change and setting up a new societal project.

No ecological transition without a societal transition

Worldwide greenhouse gas emissions are largely due to burning fossil fuels to produce electricity, drive vehicles, heat buildings, and sustain industrial processes. The necessary transformation of our energy system cannot be achieved by solely replacing these fossil fuels by decarbonised energy sources. **The overall reduction of environmental and social impacts, as well as the threat of raw material depletion, require a profound transformation of our consumption and production modes.**

it supposes profound societal transitions, both at the individual and collective levels. Hopefully, the French population does express a growing appetite for lifestyle changes to tackle environmental challenges. To be fully effective, this societal transition needs to be understood, accepted, and shared as widely as possible. Its implementation needs to be anticipated and supported by policies, rather than imposed and endured.

1. https://www.ipcc.ch/assessment-report/ar6/
2. Valérie Masson-Delmotte, co-chair of IPCC Working Group 1

Energy, a highly political topic

In order to bring together all societal stakeholders on the right path, a shared framework of public policies designed for the international, national, and local levels needs to be set. Far from being a technical issue only, the energy transition is political and cannot be restricted to a discussion between experts. **Scientific facts exist and confirm the urgency to act. They should feed and guide the public debate which is essential to make the appropriate technological, industrial, governance, and financing choices.**

The unavoidable arbitrations should lean on collectively defined criteria. The energy transition needs to answer not only to the vital threat of climate change, but also to other social, economic, and environmental challenges, as prescribed for instance in the 17 sustainable development goals of the UN. They offer a basis to compare the various energy scenarios that propose pathways to achieve climate neutrality.

Sufficiency: reconsidering citizens' needs at the heart of the decision

Energy sufficiency consists in questioning our needs and consumption habits, and more generally our current lifestyles and their impact on energy use. **Far from clichés, sufficiency does not equate to a return to the stone age, but to find joyful, creative, and shared ways of increasing fairness in how resources are consumed.** It is, foremost, an essential lever for reducing greenhouse gas emissions.

Sufficiency does not just mean saving energy at an individual level, it also encompasses a collective key aspect to transform the way our society is organised and consume energy services. Collective sufficiency must become a pillar of industrial strategies and national and local policies.

More than small steps to deliver

The ecological transition requires an immediate political action that considers the long-term challenges.

The French national planning tools (2030 and 2050 climate targets, energy investment plans, national low-carbon strategy) should not remain empty words anymore; they need to frame all policy decisions.

At local level, regional schemes and territorial climate plans ought to be consistently built within this national framework. **Policy and investment decisions at national and local levels must be sufficiently ambitious right now to meet the country's mid- and long-term objective.**

The 2022 négaWatt scenario provides a plan to tackle the crisis we are facing: it aims at substantially reducing all of the environmental impacts and technological risks related to our energy system.

The négaWatt Association additionally proposes several key policies and measures in line with the trajectory of its scenario. Sector-related or cross-cutting, they are introduced in the rest of this document. Implementation must start quickly, if France is to succeed in achieving a socially fair ecological transition and achieve its national and international commitments.

International and national commitments

At the international level (Paris Agreement): **maintaining global warming well below + 2ºC, and preferably below + 1,5ºC.**

In the European Union (Fit for 55): **reaching -55% greenhouse gas emissions by 2030 and increasing the share of renewable energies**

In France:

- Reaching carbon neutrality (net zero greenhouse gas emissions) and halving the final energy demand by 2050,
- Reducing the share of nuclear and increasing that of renewables.

MAIN PRINCIPLES AND SYSTEMIC APPROACH

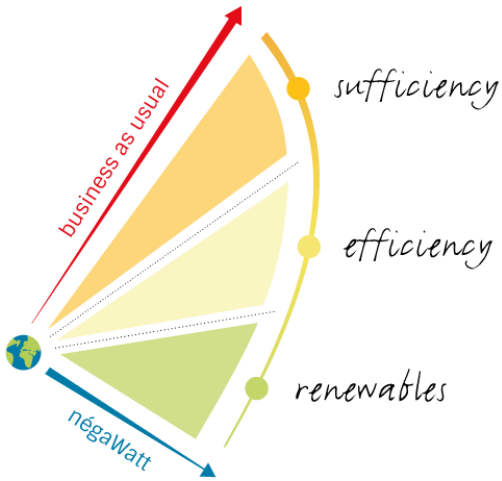
The winning triad: sufficiency, efficiency, renewables

Any energy scenario is a prospective exercise: the future it describes is not a prediction, but the modelling of a possible pathway. **The négaWatt scenario seeks a trajectory towards a sustainable and desirable future and proposes the means to make it real.**

The négaWatt scenario is no science-fiction: it builds on technologies that are sufficiently mature to be massively deployed in a timeframe compatible with the scenario objectives.

As its predecessors, the 2022 négaWatt scenario relies on the "négaWatt approach", which consists in:

- **Prioritising essential needs** in individual and collective energy usage, through **sufficiency** actions (suppressing energy waste, limiting urban sprawl, promoting alternatives to cars, reducing packaging, etc.);
- **Diminishing the amount of energy** used to satisfy these needs, through **energy efficiency** (deep building renovations, increasing the performance of appliances and vehicles, etc.);
- **Favouring renewable energies** due to their low impacts on the environment and inexhaustibleness – they are flow energies compared to stock energies that can be depleted such as coal, oil, fossil gas, and uranium.



The négaWatt approach©

A systemic vision that goes well beyond energy

Through a comprehensive modelling of the French energy system, the négaWatt scenario analyses in detail the various consumption and supply sectors. **It is built on assumptions that describe the evolution of the energy usages and production facilities.**

An ex-post facto assessment of the scenario's **socio-economic and environmental impacts** has been carried out.

It also takes into consideration the finite reserves of natural resources, notably materials. The energy-based négaWatt scenario is now coupled with a **"négaMat" scenario** covering raw and other materials, to model the potential impact of sufficiency, efficiency and renewable strategies on the need for materials.

As for the previous 2011 and 2017 issues of the négaWatt scenario, this updated version is also coupled with the **2050 Afterres scenario**, which covers the ecological transition in the agricultural, forestry, and food production sectors. This complementary scenario has been developed by the French Solagro association.

Together, the Afterres, négaWatt, and négaMat scenarios cover a wider scope, that provides a consistent overall societal analysis.

Mobility – transports

Favouring public transport, cycling, and walking

Characterised by an intensive support to road traffic development for decades, the French transport sector is the number one source of greenhouse gas emissions in the country. The strong addiction to individual cars and road freight needs to be substantially reduced.

Switching to alternative means of transport (bikes, public transports, etc.) and decarbonised vehicles will furthermore trigger massive health benefits.

Main assumptions

Individual mobility

Sufficiency

- **To shift substantially** from car and plane trips to **public transport, walking, cycling, etc.**

- **To reduce distances** (homeworking, traveling less far,...)

- To increase **carpooling and carsharing**

- **To lower speed** in urban areas and on highways

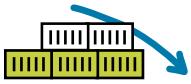
Efficiency

- **To decrease by 60% the average fuel consumption of cars**

The French car fleet shifts towards electric vehicles (59% of the fleet in 2050), rechargeable hybrids electricity-biogas (37%) and hydrogen motors (4%). In 2050, all vehicles are supplied by renewable energies.

Transport of goods

Sufficiency

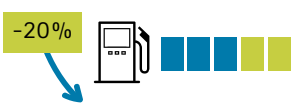


- **To reduce the amount of goods** transported

- **To increase load factors** of trucks

- **To shift substantially** from road freight to **trains and waterways**

Efficiency



- **To decrease** by 20% the average fuel consumption of trucks

The fleet of heavy goods vehicles moves from oil to renewable gas (74% in 2050), hydrogen (14%), and electricity (12%).

Key measures

1. **Investing massively in public transport and cycling infrastructures, as well** as ending any new road or airport project.
2. **Implementing a per-kilometer tax on road freight transport** to fund rail freight infrastructures.
3. **Increasing the price of air travel** (eco-charge on plane tickets, kerosene taxation, etc.) and **progressively banning short distance flights when a train alternative is available.**
4. **Banning advertisement for air travel** and vehicles covered by the French ecological malus scheme.
5. **Stopping the sales of petroleum and diesel-based vehicles** by 2035.
6. **Encouraging a European regulation** to reduce the environmental and material impacts of electric batteries.
7. **Reducing speed limits** on highways to 110 km/h.

Buildings

Prioritising deep energy retrofit

In France, the building sector is responsible for more than 40% of total energy use. The generalisation of energy retrofit at an ambitious level of performance ("BBC" label for low consumption building) is necessary to sufficiently reduce energy needs in the existing building stock.

In order to carry out this mammoth task, professional training on BBC retrofit is indispensable, and funding for a massive plan of deep energy retrofit should be an utmost priority. Generating hundreds of thousands jobs, this plan will guarantee a healthy, comfortable, and energy inexpensive housing to all French citizens. It will also contribute to tackle fuel poverty.

Main assumptions

Sufficiency

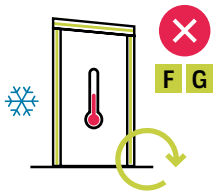
Stabilise the number of persons per housing, driven by new trends in building use (modularity, multigenerational cohabitation, etc.)

Build fewer single-family detached houses, and favour small-scale collective housing

Reduce the surface built every year (residential and tertiary), and favour the retrofit of existing buildings

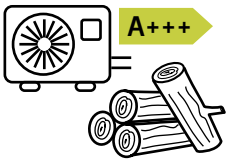
Downsize the energy-using appliances, and end the wasteful practices in air-conditioning, lighting, etc.

Efficiency



Perform the deep energy retrofit on most existing homes by 2050, starting with the ones labelled in energy class F or G

Impose for **all new buildings to be low energy consumption and built with low-embedded energy materials** (wood, mud bricks, bio-sourced insulation, etc.)



Generalise the use of the most efficient heating systems (high performance heat pumps and wood stoves, etc.)

Key measures

1. **Shifting all retrofit funds to only the high-performance BBC level.** Setting up simplified funding plans to allow each household to undertake retrofit works, notably through the anticipation of energy savings.

2. **Imposing progressively the deep energy retrofit of single-family houses** when the landlord or tenant changes and adequate technical and funding plans are available, as well as **the energy retrofit of flats and collective housing** when façade restoration works are planned.

3. **Improving energy and building laws for office buildings in order to favor BBC type renovation.**

4. **Enhancing the professional training** of all building contractors to ensure they can carry out deep energy retrofit.

An ambitious plan of deep energy retrofit would save several billions of Euros on French energy bills, as well as create hundreds of thousands of local jobs!

Industry and consumer goods – ‘négaMat’

Durable and repairable products, and sustainable industrial strategies

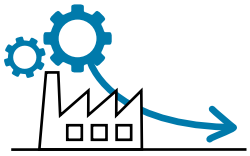
The négaWatt scenario is planning for a sustainable industrial recovery in France. New industrial strategies can be set up as long as they are based on the people’s true needs and respect the humans and the environment.

In this framework, to relocate and develop some industrial sectors nationally is relevant. This strategy would have both industrial and environmental benefits: reducing our carbon footprint and creating high-quality jobs.

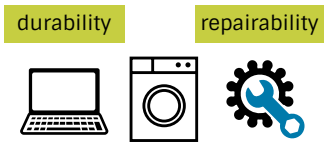
The négaWatt scenario is now enhanced with a ‘négaMat’ scenario – “Mat” for materials. Considering the challenges of critical resource depletion, it shows how much raw material consumption could be reduced and how to achieve it.

Main assumptions

Sufficiency



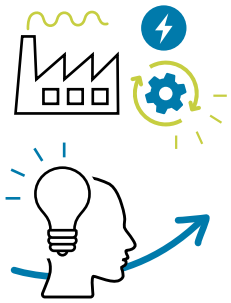
- **Reduce the production of steel, cement, and plastics**, made possible by the lowered demand in various sectors (building, transport…) and of certain products (fertilisers, packaging, etc.)



- **Make more repairable and sustainable goods,** contributing to restrain the energy and material demand

- **Increase substantially the recycling rates** for metals (95% in 2050), plastics (85%) and glass (85%), which leads reducing the needs for raw material

Efficiency



- **Improve industrial processes** through electrification and the generalisation of best available technologies
- **Speed up innovations and technological change** in order for products to be more durable, consuming less energy and reducing their environmental footprint

Renewable materials

- **Increase the use of bio-based products:** sustainable wood and green insulation materials in building, bioethanol in chemistry

- **Decarbonate the steel and iron industry, as well as the mineral and organic chemistry,** using green hydrogen produced from renewable electricity

Key measures

Reducing the environmental impact of consumer goods

1. **Increasing equipment lifetime**, notably through longer legal warrantees, an easier repairability, and a support to reuse. In sectors where such strategies are inapplicable or insufficiently effective (textile for example), a regulation of the quantity of products placed on the market should be considered.

2. **Accelerating and increasing the ambition of European regulations** on the eco-design and environmental labelling of products, including the durability, repairability, and energy performance. Implementing a mandatory indication of the environmental footprint of products, covering CO_2 emissions and durability, repairability, recyclability, and recycled content performance.

3. **Setting recycling targets with sufficient means to meet them,** by investing in waste management, and efficient and innovative sorting plants. These facilities can be funded by an eco-contribution included in the price of new products. Consumers can be further guided through mandatory information on the origin of raw materials and semi-finished components

4. **Encouraging the decarbonation of industrial processes,** notably in heavy industries (steel, aluminium, etc.), through standards related to the CO_2 content in life-cycle analysis for the building, transportation, and infrastructure sectors. Funding the necessary investments in decarbonation and ensuring their competitivity through adequate schemes.

5. **Regulating the energy consumption of telecom and digital operators.**

Reconciling industrial strategies and ecological transition

1. **Anticipating and preparing the transformations** due to the ecological transition within a policy master plan.

2. **Aiding the most impacted sectors,** notably by facilitating job mobility between sectors. Setting a ‘fair transition’ fund to support occupational and geographical mobility.

3. **Creating a parity structure with employers and trade unions,** to tackle the situation of industrial sites that are to be shut down.

4. **Boosting the sectors underpinning the energy transition:** solar panels, offshore wind energy, biogas plants, electrolysers, bio-based insulation, construction wood, heat pumps…

5. **Creating ways to value the benefits of reducing the carbon footprint** generated by the relocation of industries in France.

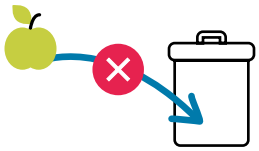
6. **Supporting recycling** by funding it through an eco-contribution at an fair level.

Agriculture – forestry – food production

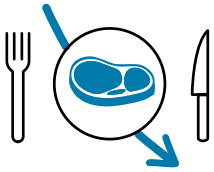
More sustainable agricultural practices and diets

The agricultural and food production sector is not consuming much energy, yet it emits a lot of greenhouse gases (notably due to livestock production). The transformation of land use systems is essential to achieve climate neutrality.

Main assumptions



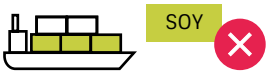
Reduce food waste



Food diets evolve, with a **reduced animal protein intake** (-50% of meat consumption in 2050) and more plant-based proteins

Agricultural practices change deeply, shifting from conventional to organic, agroecology, and integrated production

Double the pasture breeding by 2030, and halving the intensive livestock production



End soybean imports

The modelling of this sector is covered in 'Afterres2050', an agricultural, forestry, and food production scenario coupled to the négaWatt scenario.

Developed by the Solagro association and consistent with the négaWatt approach, this scenario proposes **a systemic modelling of land use and biomass production, seeking a new balance** between human food supply, livestock feeding, material and energy production, and conservation of ecosystems and soil biodiversity.

In Afterres2050, the agricultural sector generalises all best available practices and technologies. The overall level of production has been maintained, although the use of agricultural products is substantially different.

Key measures

1. **Developing a public health policy supporting a transition in food production and diets.**
2. **Reinforcing the financial support to maintain or shift to organic agriculture** generalising the remuneration of positive environmental services.
3. **Implementing a strategy to reduce significantly the use of chemical fertilisers and crop treatments.**

Meat consumption makes about 15% of French greenhouse gas emissions. These are mainly due to livestock breeding (enteric fermentation and excreta management) and to a lower extend its feeding, to the food industry, and to the related freight.

Reducing meat consumption would reduce greenhouse gas emissions and improve human health, as well as allow for a better animal welfare by shifting to less intensive livestock production.

Renewable energies

Towards a 100% renewable energy supply

Renewables are the most environmentally sustainable energy sources. At the French and worldwide levels, they are indispensable to the energy transition.

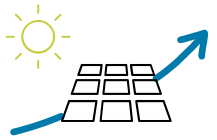
In France, they may be leveraged on the whole territory and meet total national needs. Installing renewable energy systems is a true economic and industrial opportunity, generating local jobs.

Main assumptions

19 000 3 000

Wind energy

Becoming the top energy source in 2050, onshore and offshore wind energy grows steadily. In 2050, the stock of onshore turbines is multiplied by 2.1 compared to 2020 (about 19,000 units), still far from the 30,000 units already installed in Germany today. Offshore, a little more than 3,000 turbines are installed by 2050.

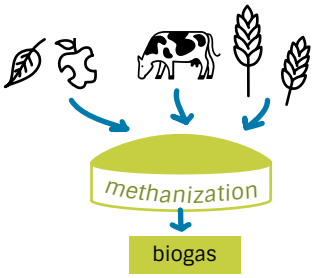


Photovoltaics

Solar energy also grows substantially, whether in small units on individual house roofs, mid-scale units on larger buildings, shade houses on parking lots, or large solar plants on wastelands devoid of agricultural activities.

Solid biomass

Wood energy increases by nearly 50%, in the form of logs, chips, and pellets. It is mostly a by-product or waste from wood material production, collected at the forestry, wood industry, and consumption stages. There is no need for dedicated forestry lands.



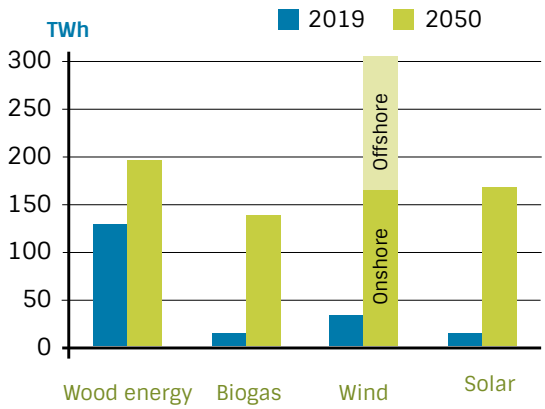
Biogas

- According to the Afterres scenario (see previous page), there is no **need to use dedicated lands solely for energy production.**
- Instead, biogas is supplied by **methanisation** of agricultural waste, livestock excreta, biowaste, and vegetation cover. The latter plays an important role in agroecological farming and becomes a standard practice on nearly all lands by 2050.
- Biogas production plants also play a key role in the agricultural transition by **replacing synthetic nitrogen** (currently produced from fossil fuels) by **biologically sourced nitrogen.**

Key measures

1. **Setting a legal and economic framework which is rational, clear and stable** for all renewable sectors.
2. **Encouraging local authorities as well as and citizens to invest together** in renewable energy projects.
3. **Implementing training programmes** in all renewable energy sectors.

Comparison of the main renewable energy sources in France in 2019 and 2050 in the négaWatt scenario



Fossil and nuclear energies

Towards a progressive phasing-out

Together with energy demand reduction, the development of renewable energies enables a near end of fossil fuel use in France by 2050, as well as the progressive shut down of all nuclear power plants by 2045. In 2030, fossil fuel consumption may already be reduced by 45% compared to 2020.

Main assumptions

Fossil fuels

As energy consumption decreases and renewable production increases, fossil energies (oil, natural gas, and coal) steadily decline. This is true for electricity production, but also and mostly in France for building heating, road transport, and industrial processes.

Nuclear energy

In the négaWatt scenario, none of the 56 existing nuclear reactors needs to be prolonged beyond 50 years. Some of them may be shut down as soon as 40 years, and no new reactor needs to be built

The pace of this nuclear shut down takes into account:

- **The energy supply challenges:** there is no step back towards coal powerplants, nor specific risks of blackouts;
- **Safety challenges:** nuclear safety should be an utmost priority, and the aging French nuclear plants represents a growing concern in this matter;
- **Industrial, economic, and social challenges** related to the nuclear sector.

Key measures

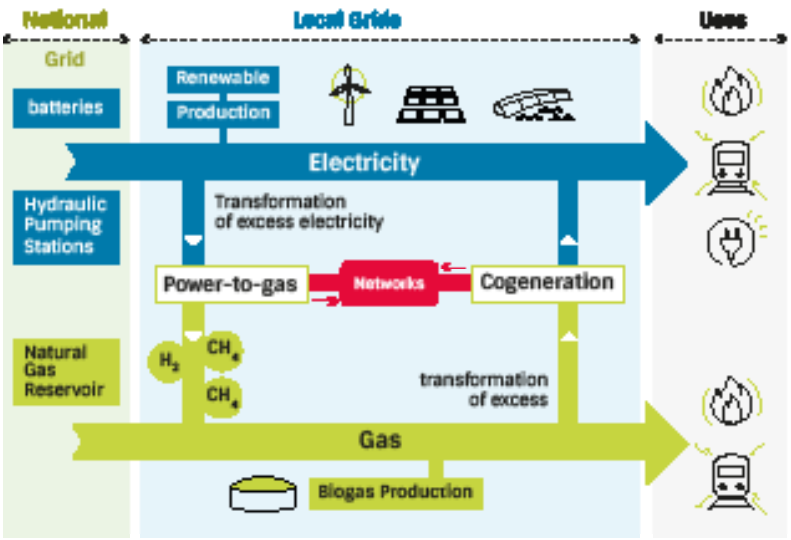
1. **Shutting down nuclear reactors when they reach 50 years of operation at the latest,** provided that the prolongation of some of the plants beyond 40 years be done under sufficient safety conditions.

2. **Implementing professional conversion plans** for the nuclear sector employees, including subcontractors.

3. **Revising the whole taxation approach on energy** to discourage the use of fossil and nuclear energies.

Balance of the electricity grid

A complementarity of energy carriers



The négaWatt model ensures that the balance between electricity demand and supply is secured on an hourly-basis until 2050. This balance is made possible because production sources complement each other, consumption can be flexible, and there is some energy storage system.

By turning excess electricity production into other useful energy resources, power-to-gas technologies allow for an increase in the installed wind and solar capacities from 2030 onwards, thus contributing to the safety of the electricity system.

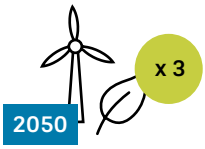
In addition to being easily stored, the biomethane and green hydrogen join the biogas from methanisation to answer many needs: mobility, industrial processes, heating, electricity production, etc.

The French energy landscape in 2050

A substantially lowered consumption, 96% covered by renewable energies

In 2050, **oil, fossil gas, and coal are nearly out of the energy picture*.**

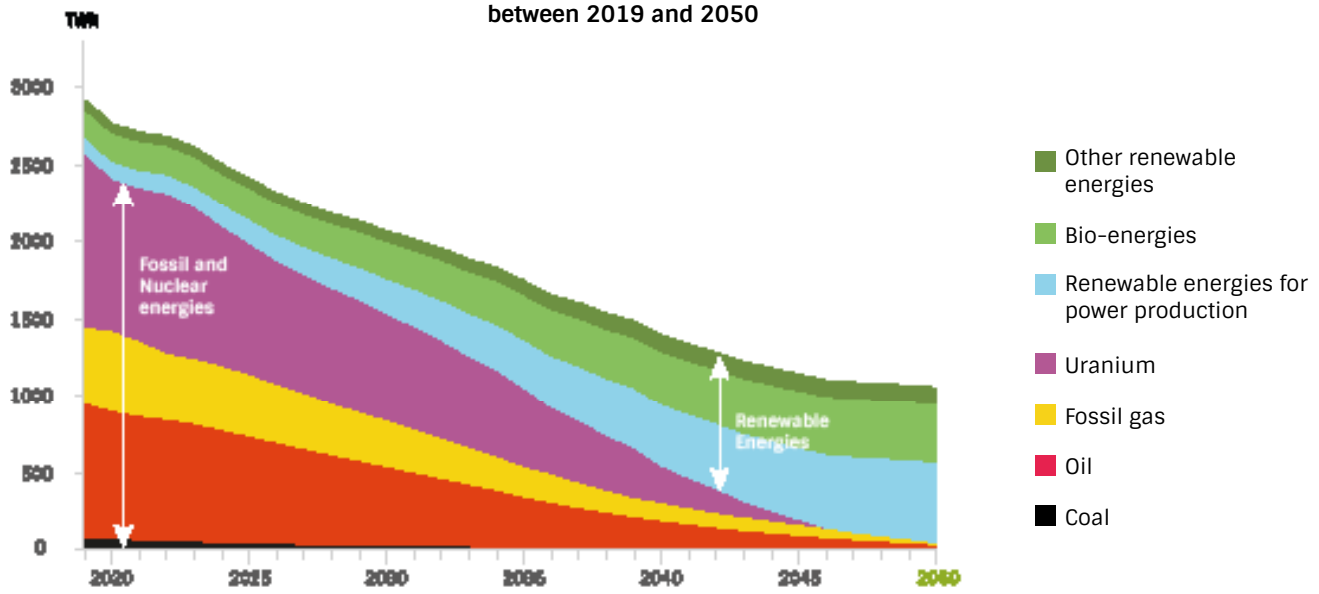
The primary energy consumption** is divided by 3 by 2050 **and renewable energy production is tripled.**



In 2045, **the last nuclear reactor is shut down.**

** These fossil fuels are only used for some material uses.*
*** Energy contained in raw energy resources (oil, uranium, wind, sun, etc.).*

Primary energy consumption for energy and material usages in the négaWatt scenario, between 2019 and 2050



Carbon neutrality achieved in 2050

Sufficiency and efficiency actions in all sectors trigger a significant reduction in greenhouse gas emissions.
An improvement in the 2022 version of the négaWatt scenario: the assessment of these emissions is made with a footprint approach, meaning that emissions related to imported goods in France are included. The outcome may vary depending on what the rest of the world does. In the figures presented below, it is assumed that the world also follows a négaWatt-type approach.

Carbon dioxide emissions (CO_2) related to energy use are divided by 28.

Methane emissions (CH_4), mostly generated by the agricultural sector, are divided by 3.

All of France **greenhouse gas emissions are** divided by nearly 9.

The transformation of the agricultural and forestry systems in the Afterres2050 scenario reinforce the carbon sink role of cultivated soils and forests, **which allows to offset** the remaining national greenhouse gas emissions and thus **reach carbon neutrality in 2050.**

Carbon sinks

In order to grow, a tree absorbs carbon from the atmosphere thanks to solar radiation (photosynthesis).

A growing forest is called a 'carbon sink', because it absorbs more carbon than it releases.

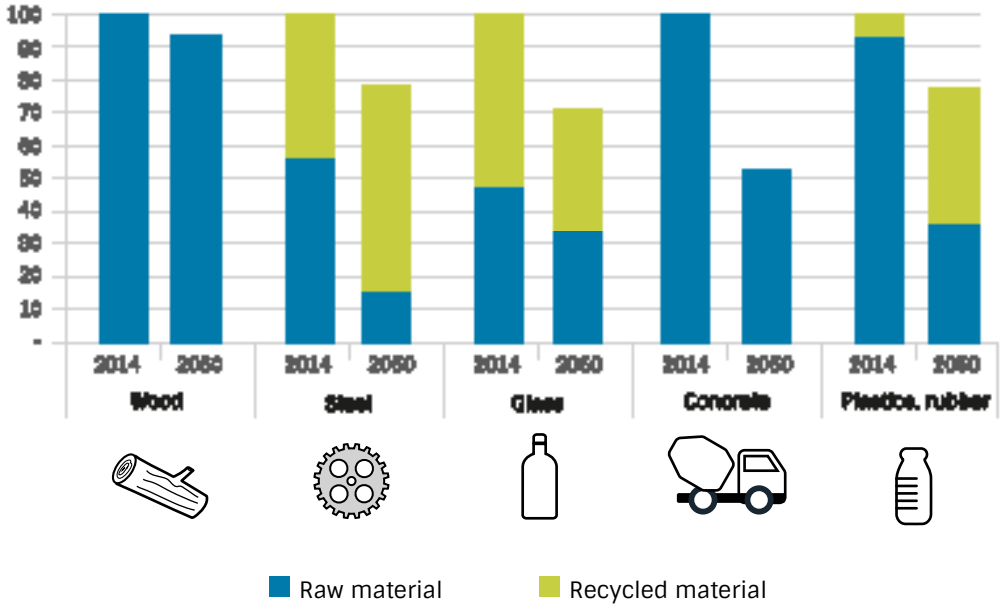
Through changing agricultural practices, soils may also become carbon sinks. For instance, no-till farming allows for a better storage of carbon underground.

A more reasonable use of raw materials

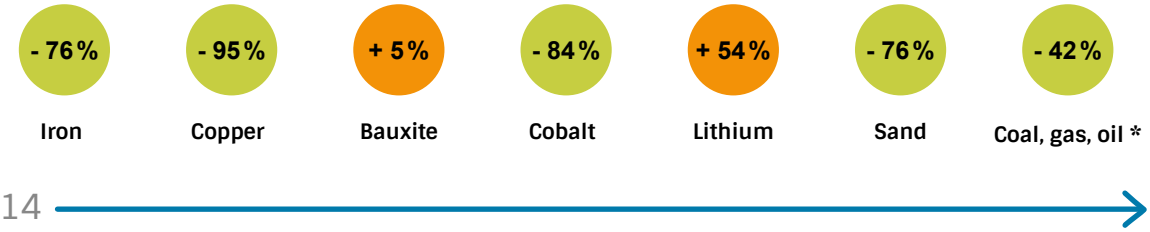
Sufficiency and efficiency in all sectors contribute to an **overall decrease of material consumption**. In addition, the replacement of non-renewable materials by bio-sourced ones, as well as the increase in recycling rates, allow to reduce even more the need for raw materials extracted from the Earth's crust.

As for greenhouse gas emissions, assessments have been made both with a **territorial approach** (material consumption in France) and **footprint approach** (materials related to the goods used in the country, even imported ones). The results presented here are those under the footprint approach. They better reflect the impact of French lifestyles and consumption modes. The calculations assume that the world reaches similar recycling rates than in the négaWatt scenario.

Material consumption in the 2022 négaWatt scenario



Evolution of the annual extraction of raw materials between 2014 and 2050 in the 2022 négaWatt scenario



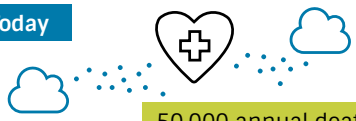
** Non-energy uses*

This overall reduction in raw material use mitigates two issues. The first is the risk of depletion of these finite resources. The second relates to the conditions in which these materials are extracted, often at terrible costs for local populations and the environment.

The only material that is substantially on the rise is lithium, because of the massive uptake of electric vehicles. Although such vehicles appear indispensable in any carbon neutrality pathway, their role remains constrained in the négaWatt scenario: it does not become the unique silver bullet for cars and trucks.

Positive health impacts

Today



50,000 annual deaths

Air pollution, responsible for nearly **50,000 premature deaths in France every year**, has become a key challenge for public health.

Tomorrow

Reduction of fine particles

Many actions assumed in the négaWatt scenario will generate a **significant reduction of fine particle emissions**, preventing thousands of deaths each year: reducing road traffic, phasing-out from diesel fuels, lowering heating needs, updating wood heating systems, changing agricultural practices, etc.

Health benefits

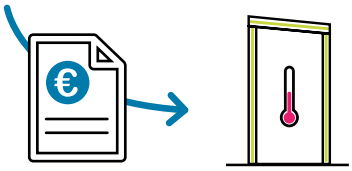
The increase in cycling and walking, instead of driving individual cars, is a lever to reduce air pollutants. It also substantially contributes to a better health as it means more physical exercise. Between 2035 and 2050, more than **10,000 annual deaths are avoided.** Average life expectancy in France could increase by three months this way.

Positive economic and job impacts

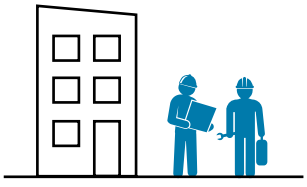
More physical activity

€ 38 billion saved annually

Avoided deaths through physical exercise may be valued in economic terms, by using the assessment figures recommended in the French public sector. It leads to **an annual 38 billion Euros benefit, on average over the period 2021-2050**, compared to today. A similar benefit of several dozen billion Euros may also be expected from the steep cut in air pollution.



For consumers, the energy transition also means a greater resilience to fluctuating energy prices, and reduced energy bills. The necessary investments to achieve this transition (building retrofit, efficiency gains, mobility changes, etc.) are profitable in short, mid and long term.



Finally, **the energy transition as proposed by négaWatt is compatible with job creation,** as shown by assessments carried out on the previous négaWatt scenario editions[3]. As an example, **in the 2022 scenario more than 250,000 jobs could be created as soon as 2030 in the building renovation sector** (and 300,000 in 2040), as well as close to 90,000 in renewable energy systems (and 135,000 in 2040).

3. AnAnalysis available (in French) on https://negawatt.org/

The négaWatt Association

Since its creation in 2001, the French négaWatt Association (non-profit) promotes energy savings, a pillar of its sufficiency, efficiency, renewables approach. The goal is to support a more respectful society towards resources, the environment, and human beings.

The specificity of négaWatt lies in its collective ability to analyse energy issues in a systemic manner, and to suggest concrete and realistic solutions inspired by field experience.

Based on these shared values, the founders of the association have launched independent modelling exercises of the future of the French energy system, aiming at fuelling public debates on energy issues. The association has also increasingly undertaken advocacy activities towards economic leaders and policy makers, to share and implement its recommendations for an ambitious energy transition that meets the challenges at stake.

The 2022 négaWatt scenario is the result of a non-profit work made largely by volunteers. The coordination and dissemination have been possible thanks to a crowd-funding campaign organised in March 2021, and the support of organisations and companies including the European Climate Foundation, the Charles-Léopold Mayer pour le Progrès de l'Homme Foundation, and the Terre Solidaire Foundation.

European Climate Foundation

FONDATION TERRE SOLIDAIRE

The association gathers more than 1,500 members who support its approach and activities. Why not join? More details at: www.negawatt.org

You can also access additional information in French about the 2022 négaWatt scenario (full report, detailed figures, graphics, videos, etc.)

The négaWatt Association also manages 'Décrypter l'énergie', a debunking website on energy transition in France where you can find information **in English:** detailed analysis, facts and figures, and references.
www.decrypterlenergie.org

The négaWatt Institute

The négaWatt Institute is the operational branch of the association, founded in 2009. Building on the recommendations of the négaWatt scenario, it contributes to train and support organisations involved in the energy transition, such as local governments, businesses, or others who have decided to act.

www.institut-negawatt.com

negaWatt.org @nWassociation negaWatt.association association-negawatt

Cover photo credit : ©iStock.com/Nikada
Association négaWatt, BP 16280 Alixan, 26958 Valence Cedex 9 / contact@negawatt.org. - October 2021 - Impression Printworks Paris