ASSOCIATION
négaWatt

Energy sufficiency

Towards a more sustainable and fair society

A necessity for the climate and resources

An individual and collective approach

A fairer consumption

Passing down benefits and incomes to future generations rather than burdens and debts

www.negawatt.org

Energy sufficiency: consuming less to live better

Sufficiency is one of the three main pillars of the approach promoted by the French négaWatt Association since its establishment in 2001. It is **an essential part of the energy transition scenario** developed by this think tank.

The concept is now enshrined in the first Article of the country's 2015 Energy Transition Bill. It is being progressively acknowledged and taken into consideration by stakeholders. However, it is also often misunderstood, and negative preconceptions hamper its acceptance and implementation.

A growingly shared concept

The négaWatt Association is not the only one to promote the sufficiency concept. In France and abroad, other organisations (institutions, businesses, NGOs, etc.) contribute to its popularisation. The word now exists in several languages, such as 'Energie Suffizienz' in German. Approaches similar to négaWatt have been developed, and more and more academic publications can be found on the matter. The launch in 2018 of an international expert network on sufficiency (ENOUGH), and the website www.energysufficiency.org are two illustrations of the increasing interest for the topic.

A necessity for the climate and resources

The way our societies and lifestyles are currently organised leads us to use massive amounts of energy to satisfy our daily needs (heat and cool our buildings, eat, move, etc.). This is the result of choices of infrastructures and socio-cultural evolutions that paid little attention to the resulting waste of energy and materials.

If the whole humanity lived like an average French person, three planet Earth would be necessary to satisfy its needs. This overconsumption is a source of pollutions and greenhouse gases which affect the climate and endanger the very conditions of life on Earth.

A fairer consumption

Becoming more frugal is a priority in industrialised countries, where levels of energy consumption have sometimes reached immoderate levels, generating inequalities. There are also populations in these countries and elsewhere in the world that still have trouble accessing basic energy services such as heating, cooking and lighting.

Sufficiency is part of the solution: **consuming less to allow those who need it to consume enough,** while avoiding the pressure and conflicts on energy and resources.

An individual and collective approach

The way to really tackle these waste trends is to primarily reflect on our needs. Energy sufficiency is about prioritising energy uses that provide a genuine service, and dropping those that appear superfluous. **Sufficiency means changing our behaviour by better considering its impacts**. Such lifestyle changes are not only relying on individual choices, but also largely on collective ones. It is not enough to want to switch to cycling, cities need to be redesigned to facilitate it.

Sufficiency is hindered by strong habits and the idea that comfort or even happiness lies in the accumulation of material goods. This traditional view is however questioned by a growing number of persons who think that **another approach is indispensable, desirable, and possible.**

Energy sufficiency and efficiency are complementary

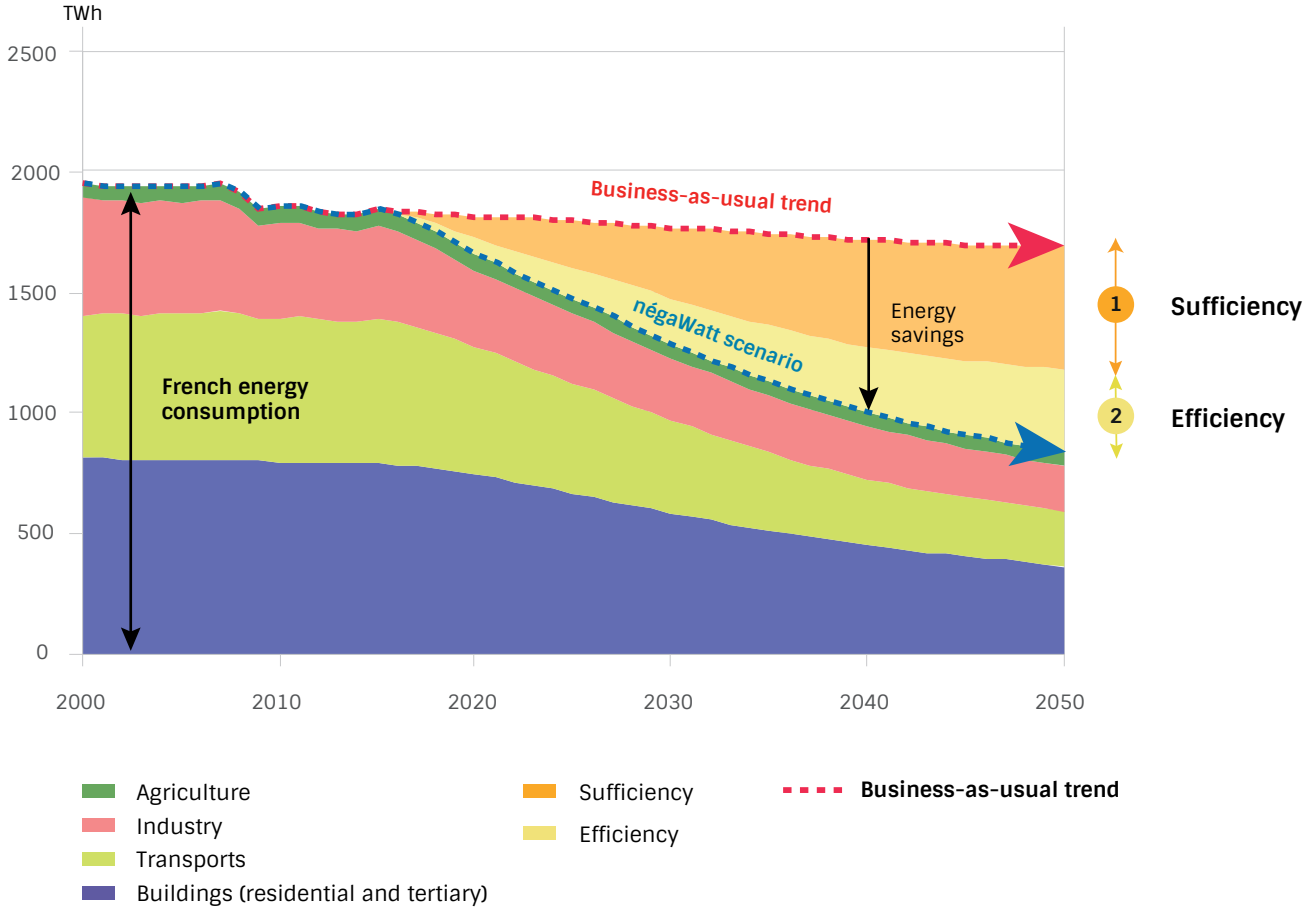
Progress has been achieved in the design of more energy efficient equipment. Yet, these efforts have often been counteracted by the lack of sufficiency policies. For example, even though vehicles tend to consume less fuel than before, the fact that overall travelled distances have increased keeps annual fuel consumption at a high level.

Far from being utopian, sufficiency is already being experimented in **multiple initiatives and local projects**. New practices will further spread if public authorities support them, and if our economy shifts towards the development of less energy intensive services and more durable goods.

Is sufficiency the enemy of growth?

While it is true that sufficiency involves replacing certain energy-guzzling activities by more sober ones, it doesn't necessarily mean an economic decline. Alternative sectors will be boosted (eco-friendly mobility, veggie food, local tourism, etc.), and businesses will be able to grow on services that answer our needs differently.
An economic assessment of the négaWatt scenario has found a positive impact on jobs, and shown that an energy transition based on sufficiency, efficiency, and renewables would provide **economic, social, and environmental benefits** to the French population.

Final energy consumption trends in the négaWatt scenario between 2000 and 2050



Sufficiency, a substantial potential

In the négaWatt scenario, energy sufficiency generates a **28% cut in energy use by 2050 compared to 2015***. This remarkable overall potential is the result of quantified assumptions on dozens of parameters, inspired by data and field observations. The most salient ones are described in the next pages.

** in final energy (supplied to the end-user, such as kilowatt-hour of electricity, litres of fuels, etc.)*

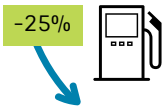
Transports

Towards a lighter mobility

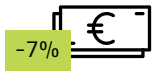
Transportation is the first source of greenhouse gas emissions in France. Ambitious changes are therefore necessary, also to reduce local air pollution - responsible of 50,000 premature deaths each year -, and facilitate mobility for everyone.

Lowering speed limits on roads and highways

Impact of a reduction of speed limits on highways from 130 to 110 km/h



25% cut on fuel use



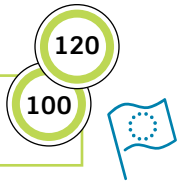
7% cut on fuel expenses
(all trips included)

8 minutes longer trip over 100 km

Speed limits on national roads have been lowered from 90 to 80 km/h in 2018 in France. This decision was motivated by road safety, but **it also supports energy sufficiency.**

In order to pursue the trend and avoid a shift from national roads to faster ways, it would be relevant to also reduce speed limits on expressways (from 110 to 100 km/h) and highways (from 130 to 110 km/h).

And elsewhere? Many European countries (Belgium, Switzerland, Norway, etc.) have set lower speed limits, such as 100 km/h on expressways, or 120 km/h on highways.



Reducing distances

travelled distances

There is no question of stopping people from moving. They can still do so, but in a less intensive way, notably through reducing the distances they need to travel. **The latter are reduced by 16% on average by 2050** in the négaWatt scenario, starting by the most constrained ones (such as travels to the workplace).

Home working development allows for a reduction of travelling needs, while increasing productivity. A better urban planning mixing residential, office and shop areas would also avoid some of the travelled distances.

Remote working: an increasingly common practice

Remote working is not just about working from home, but also from co-working spaces where work equipment is shared.

Countries such as **Belgium or the Netherlands** are supporting this approach, with positive results : **the share of teleworkers is 3 to 4 times higher than in France.**

Do you like to travel? In the négaWatt scenario, people can still go on holidays! But to avoid air trips (that are the most energy-guzzling ones), less exotic destinations should be prioritised and planes used only occasionally for distances above 800 km. négaWatt considers a reduction in the number of air trips back to the level of 1990.

Why is flying a particularly unsustainable transport mode?

Plane is the most CO_2 emitting mean of transport by kilometre and passenger. **A trip from Paris to Barcelona by plane releases 45 times more greenhouse gases than by high-speed train.**

Today, only a minority of the world population travels frequently by plane. But the sector is experiencing a fast and unsustainable growth, supported by massive tax exemptions and subsidies. Air traffic has increased by 130% in France over the past 20 years, and by close to 80% in the world in the last decade..

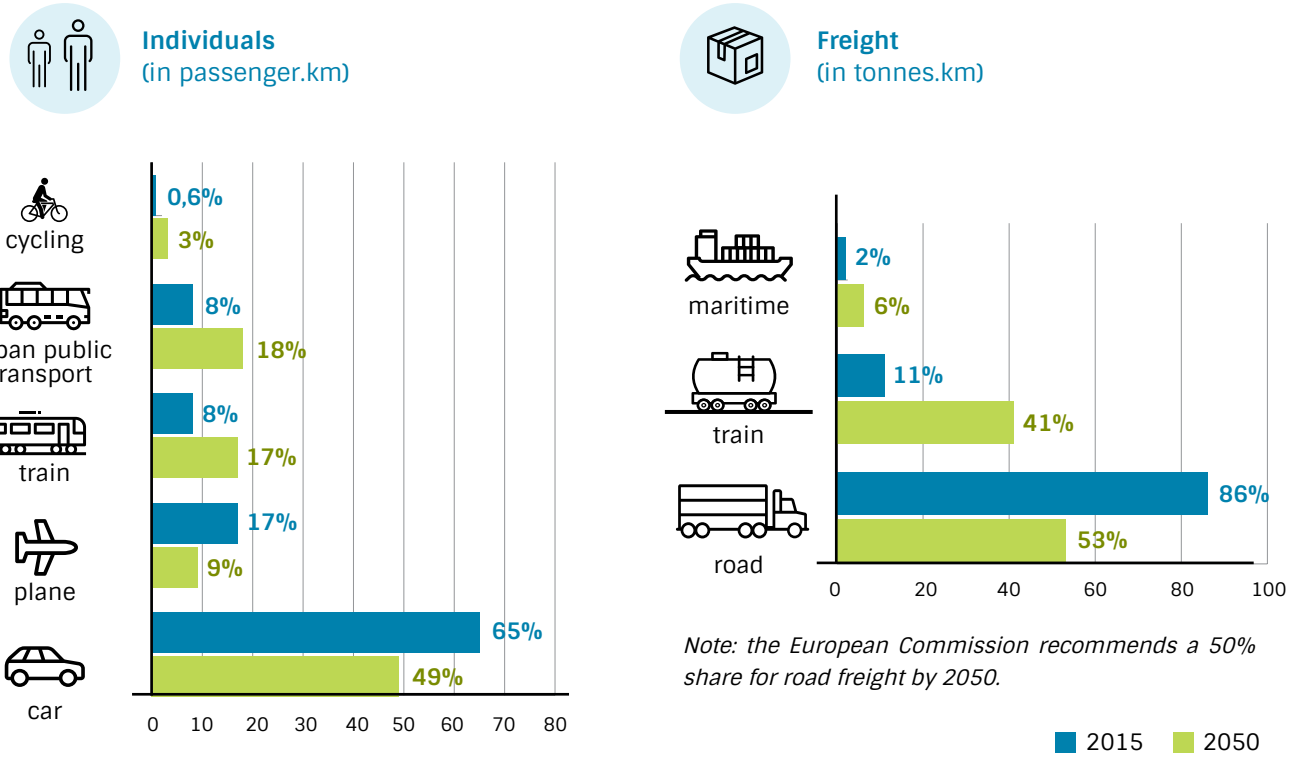
Key policy

Ensuring a fair price of air and road transport, reflecting their environmental impact and devoid of tax breaks.
This would generate funding for alternative modes (train, public transport, cycling, etc.).

A shift from air and road traffic to less polluting transport modes

In the négaWatt scenario, the shift to the lowest energy using and polluting means of transport (train, urban public transports, cycling, walking, scooters, etc.) is prioritised.

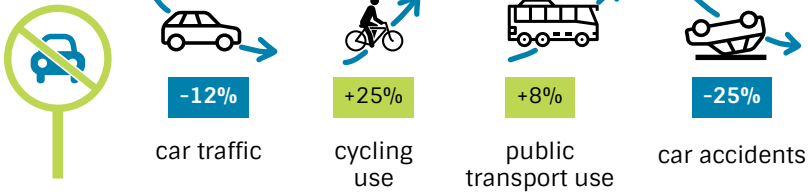
Share of transport modes from 2015 to 2050 in the négaWatt scenario



Note: the European Commission recommends a 50% share for road freight by 2050.

Elsewhere?

In Ghent (Belgium) - 250,000 inhabitants: The car-free city area has been recently increased by close to 50%, reaching 51 hectares (i.e. 0.3% of the total area). Significant impact has been registered.



Buildings

A more reasonable approach to buildings and appliances

Buildings (residential and tertiary) are the first source of energy consumption in France. Beyond the necessary thermal renovation of the building stock, there is a substantial potential for sufficiency in the design, construction, use and equipment of buildings.

Curbing the growth of built areas

The French building stock currently increases faster than population. Should this trend continue, **380 million of m² of tertiary spaces and more than 6 million of dwellings would be constructed** between 2015 and 2050, **due to population growth** (+12%), **as well as trends in smaller household sizes** (2.0 members in 2050 compared to 2.2 today).

This would increase energy consumption (for heating and appliances), construction material use, and land use.

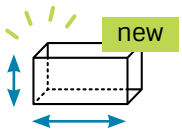
Key policy

Through fiscal incentives, stimulating **the modularity and the sharing of spaces**, to optimise the use of existing buildings.

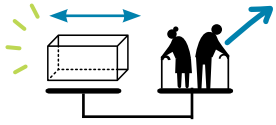
The négaWatt scenario considers a change in those trends, supported by sufficiency approaches.

Stabilisation of the average size of households (through the increase of flat sharing and intergenerational living, etc.)

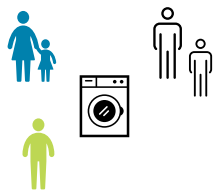
Reduction of the share of detached houses in new construction (from 46% in 2015 to 20% in 2050), replaced by multi-family buildings



Stabilisation of the average size of new dwellings



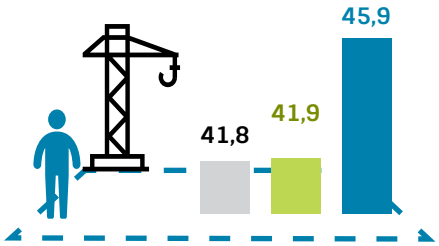
A more user-driven evolution of tertiary spaces (with more local services for an ageing population)



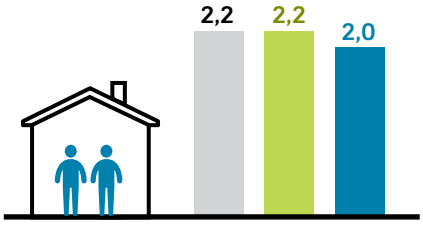
Increased space and equipment sharing (e.g. laundry rooms)

Stabilisation of built areas and household sizes

In the négaWatt scenario, the average dwelling size and number of members per household is close to the current situation in 2050.



Average dwelling size per person in m²



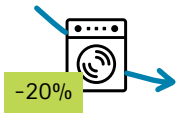
Number of household members

In 2015
In 2050, in the négaWatt scenario
In 2050, business-as-usual

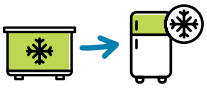
A sense of moderation on appliances

We are surrounded by all kinds of devices, which are becoming more energy efficient, but whose number, size, and functionalities ever increase. **The electricity consumption in France in the residential and tertiary sectors has grown six-fold since the 70's!** Sometimes frivolous, redundant, and quickly obsolete, these gadgets do not always fulfil us. A British survey on this topic has revealed that among half of the interviewees felt some regrets about at least one of their latest purchases.

The négaWatt scenario assumes a relative change in trend, with a growing sense of moderation on a number of products.

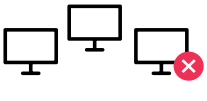


20% reduction in the number of tumble driers (replaced by line drying or shared)



Substitution of a part of stand-alone freezers by fridge-freezers

A single big TV on average per household, the rest being mobile screens



A better regulated growth of screens in public places

The digital revolution is a specifically strong driver in the multiplication of new equipment and connected devices. There is no question of getting rid of it (in the négaWatt scenario, people will still use smartphones and computers), however there are ways of **combining regulations, awareness raising, and the diffusion of best practices** to contain the overall growth of digital equipment to a doubling, instead of a tripling or quadrupling, by 2050.

According to an American study, **20 to 30% of computer servers in data centres are 'zombies':** they remain powered on without delivering any services. As much electricity that could be saved!

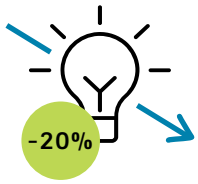
20% à 30% of **'zombies servers'**

Less excess in lighting

LEDs (light-emitting diodes) are becoming mainstream in lighting. They consume so much less than previous bulbs that we feel free to multiply them everywhere, sometimes unreasonably. **The number of lighting points is skyrocketing, especially in public spaces.**

Containing this rebound effect should be a prime concern for authorities. There are multiple ways to reduce excesses (prioritising natural light, motion sensors, lighting on demand, etc.).

Trends in lighting in the négaWatt scenario



20% decrease in lighting points by 2050 compared to 2015, by supressing the most frivolous

Reduction in average usage time: 10% in the residential sector, and 35% in tertiary buildings (mostly when they are unoccupied)

Light pollution is not a fatality

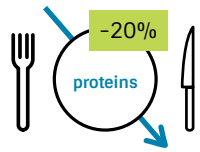
A 2013 decree in France imposes that office and shop lighting be switched off at night after 1 am. Although it is not sufficiently controlled, this relevant energy sufficiency measure is also good for biodiversity.

Agriculture

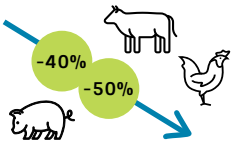
From field to food: a new approach to implement

As far as food is concerned, sufficiency goes very much hand in hand with health. Authorities remind us to avoid eating too fat, too sweet, too salty, too processed, and too refined. French people ingest on average 45% proteins and 25% sugar in excess. Wholemeal products are much more nutritive than white ones.
Sufficiency is not about privation, rather about reducing such excesses in consumption.

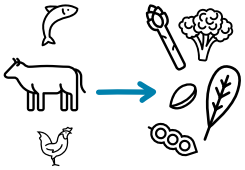
More plant-based diets



20% average cut in proteins in food

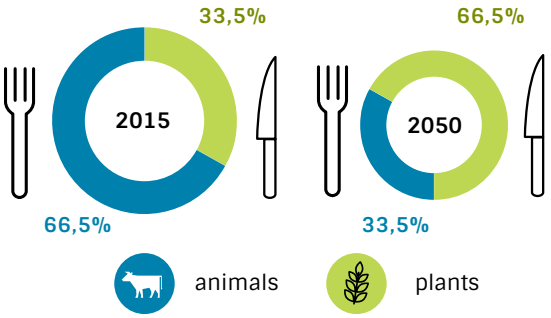


in particular through **an average 40 to 50% reduction of meat consumption.**



Increase of the share of plant-based proteins.

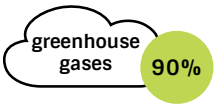
Evolution of diets in the négaWatt scenario



These potential changes in eating behaviour will obviously have consequences on agricultural habits: more crops will be needed, as well as a deep reorganisation of livestock breeding that has a strong impact on rural landscapes.

Meat consumption: impact and evolution

80% of French agricultural lands are devoted to animal-based products

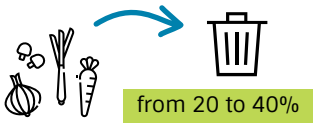


which emit **90% of greenhouse gases** from the food sector.

A lower meat-based diet is healthier and better for the climate.

Meat consumption has stabilised in France since the 80's. It has even started to go down by 12% between 2007 and 2016.

Avoiding food waste



Sufficiency also means diminishing waste, which affects **20 to 40% of foodstuff** placed on the market.

The French Energy Transition Bill has set **a target of halving this waste by 2025** (even faster than in the négaWatt scenario).

Key policy

Introducing greenhouse gas emission criteria in dietary guidelines, to take into account the environmental impact of food production

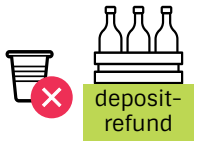
The négaWatt scenario is coupled with Afterres2050, an agricultural and food transition scenario developed by the French Solagro organisation: www.solagro.com

Industry

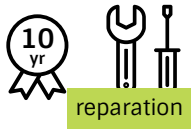
Favouring the production and consumption of durable products

Sufficiency in industry stems from changes in other sectors: for instance, less built areas means a more moderate need for industrial materials. Other opportunities lie in improving the durability of products and recycling practices.
Close to 30% of the French industrial energy consumption could be saved by 2050.

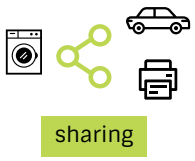
Longer product lifetimes: reusing – repairing – sharing



Reduction of the share of disposable products (e.g. through a ban on plastic dishes) **and implementation of deposit-refund systems** for glass and PET plastics.



Longer warranty periods on products, and better standardisation and availability of spare parts.



Development of product sharing, such as car-sharing, shared laundries, co-working, product leasing, etc.

Key policy

Imposing a longer legal warranty on products, and ensuring that **manufacturers provide spare parts for at least 10 years**

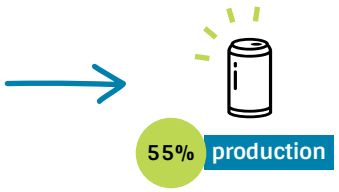
Trends supporting product durability

There is an increasing concern about this issue. France has introduced in 2015 a bill **forbidding planned obsolescence**. Private initiatives are also mushrooming, such as second-hand markets and repair cafés. Some **businesses also take the lead:** a French big company has decided to promote product repairing, through enhancing customer services and committing to make 5 million spare parts available for 10 years.

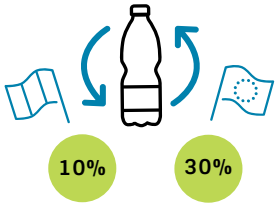
Increased material recycling

Although some efforts have been made to support the collection and recycling of material waste, significant remaining potentials need to be achieved.

In France, 75% of scrap metals are collected,



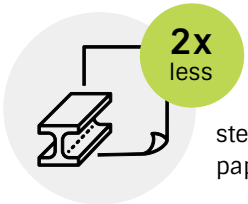
yet only 55% are actually reused in production.



In France, the rate of plastics recycling is below 10% while it is close to 30% in some neighbouring countries.

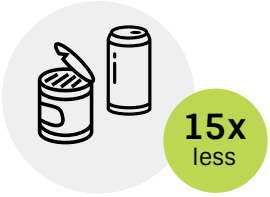
Recycling material is less energy intensive

Producing a recycled material requires less energy than creating a new one from raw resources.



steel and paper

plastics



aluminium

Sufficiency: a path towards a more cohesive society

For many reasons, we have lived so far with the idea that happiness could be reached through piling up goods and satisfying all our immediate needs, be they sound or not. These reasons include an abundant and cheap energy, an economic approach favouring overconsumption of quickly obsolete and disposable products, an obsession for speed, etc.

Rethinking the fundamentals of what living in society is about

The detrimental consequences are now plain: water and air pollution, armed conflicts over resources, increasing inequalities, climate change, extinction of numerous species, etc. Rethinking the fundamentals of what living in society is about becomes necessary.

Energy sufficiency is one of the aspects of the cultural change we need. Reducing our energy consumption means lowering our bills, but also the trade deficit of our country. It is also about cleaning-up our air, creating new jobs and local services, and ensuring that everyone can satisfy its basic needs of a warm home and mobility. Sufficiency is sometimes denigrated as privation, whereas it can be a perfectly chosen and desirable lifestyle.

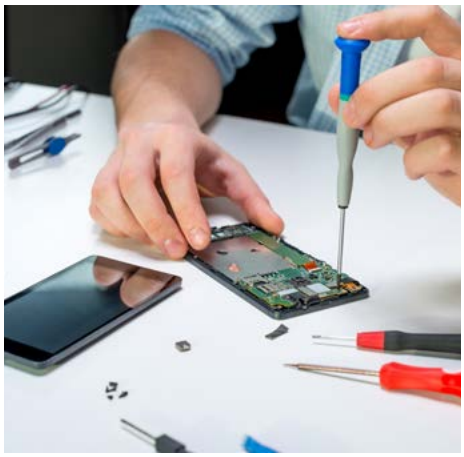
Sufficiency, sometimes denigrated as privation, can be a perfectly chosen and desirable lifestyle

With sufficiency, we do not push at all for some sort of uniform monastic life. Personal choices and experiences remain largely open. To illustrate that, the French Energy Agency (ADEME) has issued in 2014 a study **showing the variety of possible lifestyles in a society where energy use has been halved** and mostly supplied by renewable energy sources.

Through the description of the everyday lives of 16 families by 2030 and 2050, it reveals that energy transition is achievable without prejudicial disruptions to the well-being of people, whatever their living place, income levels, family condition, or age.

To go further, social norms will need to evolve

How can people be convinced to change, when most of the messages they receive encourage them to consume always more? Faced with contradictory exhortations, some of them willingly embrace sufficiency. However they remain a minority for now, amongst a majority that is still driven by the forces of consumerism and materialism. **To go further towards sufficiency, social norms will need to evolve.** The current drop in meat consumption in France is an example of such a soft evolution, whereby animal well-being is more prioritised and the cultural beliefs associated with meat (health, strength, social statute) are deconstructed.



Beyond personal choices, it is also through a collectively shared perspective of a desirable future that energy sufficiency can spread more largely. In this, **the role of public authorities is crucial.** In cities where infrastructures supporting cycling are developed, the share of cycling usually increases. Promoting intergenerational living helps not only to reduce the energy use per capita, but also to recreate social links and fight isolation.

Beyond personal choices, it is also through a collectively shared perspective of a desirable future that energy sufficiency can spread more largely

Private businesses can and should also contribute, by e.g. designing more durable products that support energy savings, favouring remote working and teleconferences instead of long distance travels, etc.

Sufficiency is not only a step towards a better coexistence between humanity and the planet we live on; it is also a project for a more cohesive society where each one moderates its ecological footprint to allow less fortunate ones to live better. **It is the promise of a fairer and more sustainable future for everyone.**

ASSOCIATION négaWatt

The négaWatt Association

The négaWatt association is a non-governmental French think tank involving around twenty experts in energy issues with strong field experience and complementary skills. Established in 2001, it is supported by more than 1,200 individual members.

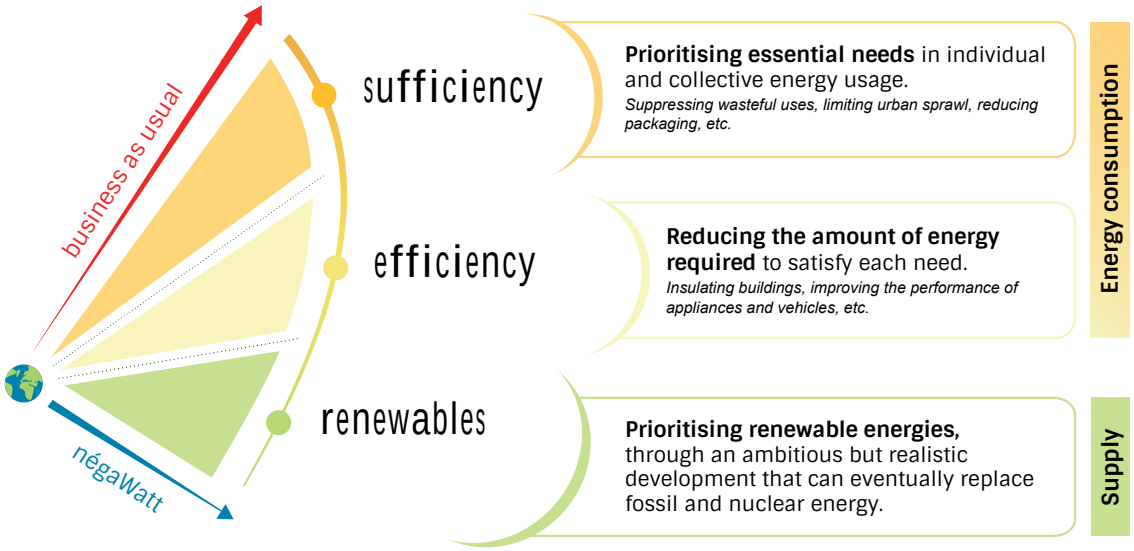
Its main purpose is to **recommend solutions** on energy demand and supply to implement an energy transition in France, reducing as much as possible all the detrimental risks and impacts of the national energy system (greenhouse gas emissions, air pollution, resource depletion, energy poverty, nuclear accident risks, etc.).

Through applying the négaWatt approach to France - based on energy sufficiency, energy efficiency, and renewable sources - the organisation has developed **an energy transition scenario** for the country, which reaches 100% renewables by 2050 and dramatically reduces greenhouse gas emissions.

www.negawatt.org

The négaWatt Association is a non-profit organisation mostly funded by individual member fees, as well as contributions from benefactors, foundations, and NGOs.

To support the négaWatt Association and its work: www.negawatt.org/soutenir-negawatt



More information

Website of the négaWatt Association (English section): www.negawatt.org/en

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