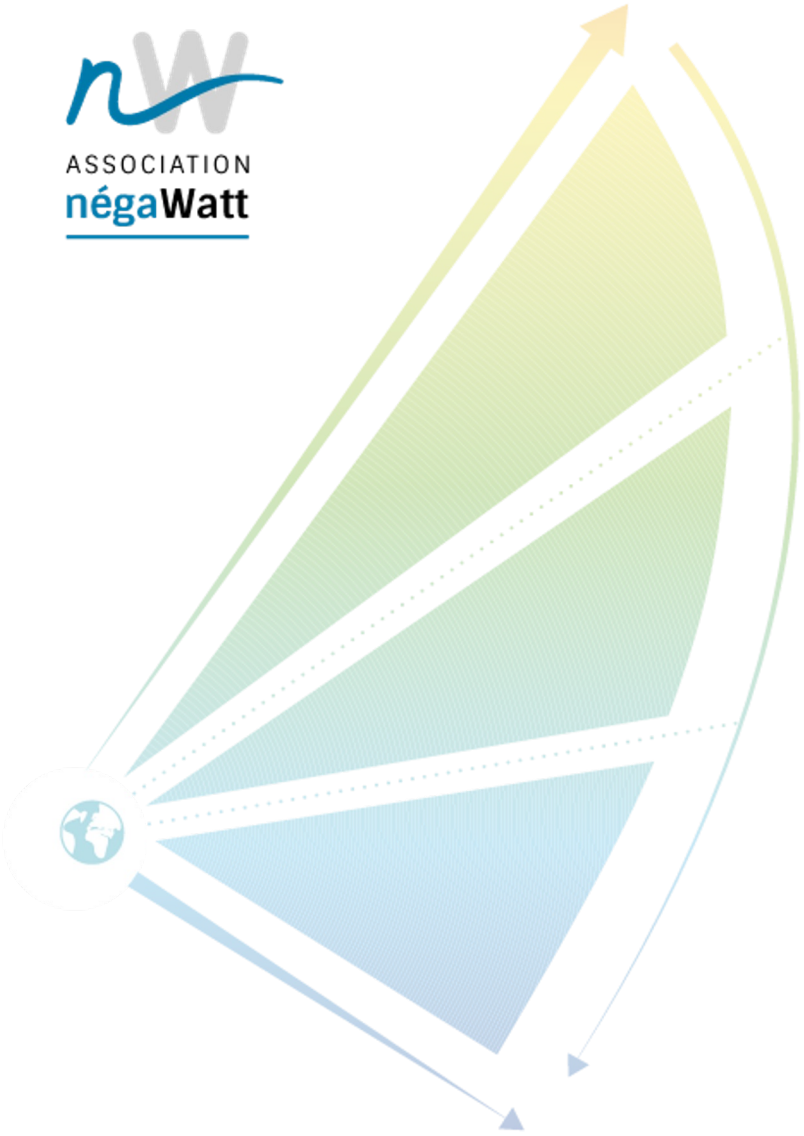
ASSOCIATION négaWatt

EERA European Energy Research Alliance
clean Energy tranSition for Sustainable Society (e3s)

Levi Cases



EERA JP e3s Conference

"Fostering change in energy consumption: a pathway to demand reduction"

Energy Sufficiency

The concept and role of sufficiency in fostering a sustainable and just energy transition

Yves MARIGNAC
Senior advisor on energy transition and scenarios, spokesperson
Association négaWatt

Accademia Galileiana di Scienze, Lettere ed Arti
Padova · 26 October 2023

What is négaWatt?

ASSOCIATION négaWatt

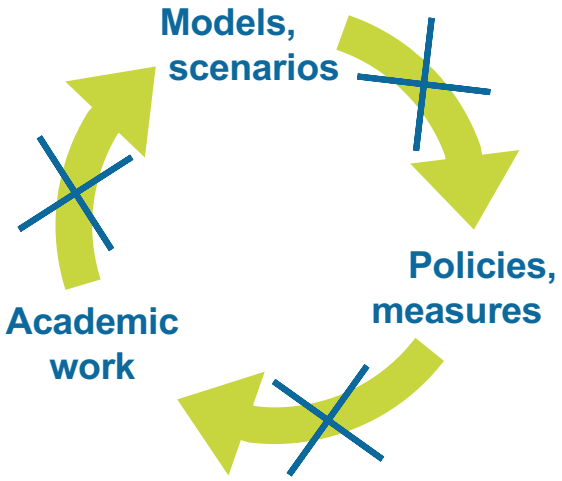
- A French **think tank on energy** created in 2001
- A **non-profit, independent group** of experts and field-practitioners
- 20 employees + an active core of ~50 “companions” and “ambassadors” ~1600 members
- Producing **sustainable energy scenarios** based on a sufficiency / efficiency / renewables framework for France (latest in October 2021) and Europe (released in June 2023), proposing systemic policies and measures

A “group”, with subsidiaries acting on the ground

INSTITUT négaWatt

dorémi
rénovons dans le bon sens !

Obstacles to the emergence of sufficiency



A vicious circle…
due to numerous obstacles

Blur of the concept
Weak explicitation of related levers

Models limitations
Optimisation (objective function…)
Orientation (supply, growth…)

Lack of data
Statistics (indicators, disaggregation…)
Litterature base (empirical studies, return of experience, impacts/benefits…)

Adverse representations
Individual comfort (purchase power, happiness, individual freedom…)
Lifestyles (social success, modernity, rejection of the normative…)
Economic system (growth, rejection of sectorial decline, competitiveness…)

5 lessons
about needs and wants for sufficiency

1 **Sufficiency**, as distinguished from *and* combined with efficiency, is key to reduce **energy demand** (and that of other resources)

A systemic and systematic approach

Distinguishing between *efficiency* and *sufficiency* leverages to combine their effets in energy savings, is key to shift away from addi(c)tion of (to) resources

Selection and preparation of the primary resource

Transformation

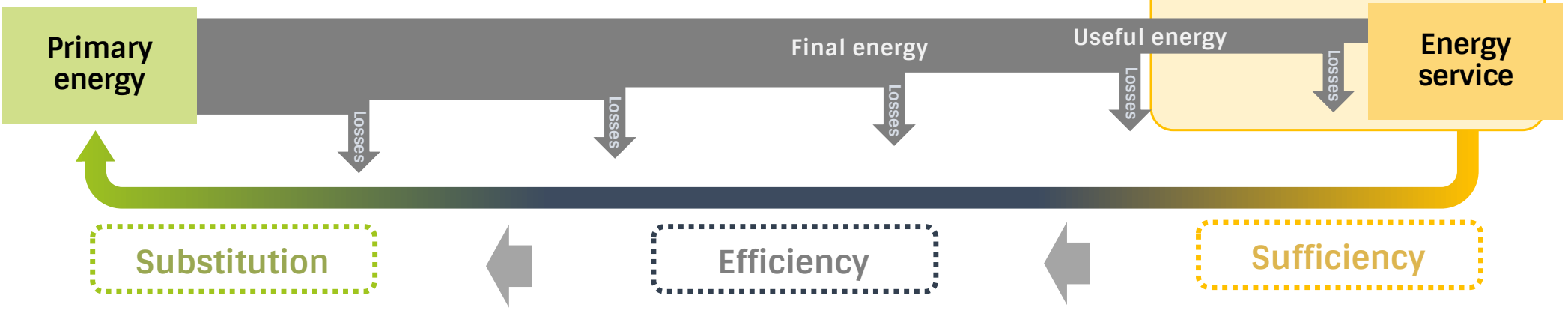
Delivery of final energy to end user

Conversion into useful energy

Individual and collective action on uses

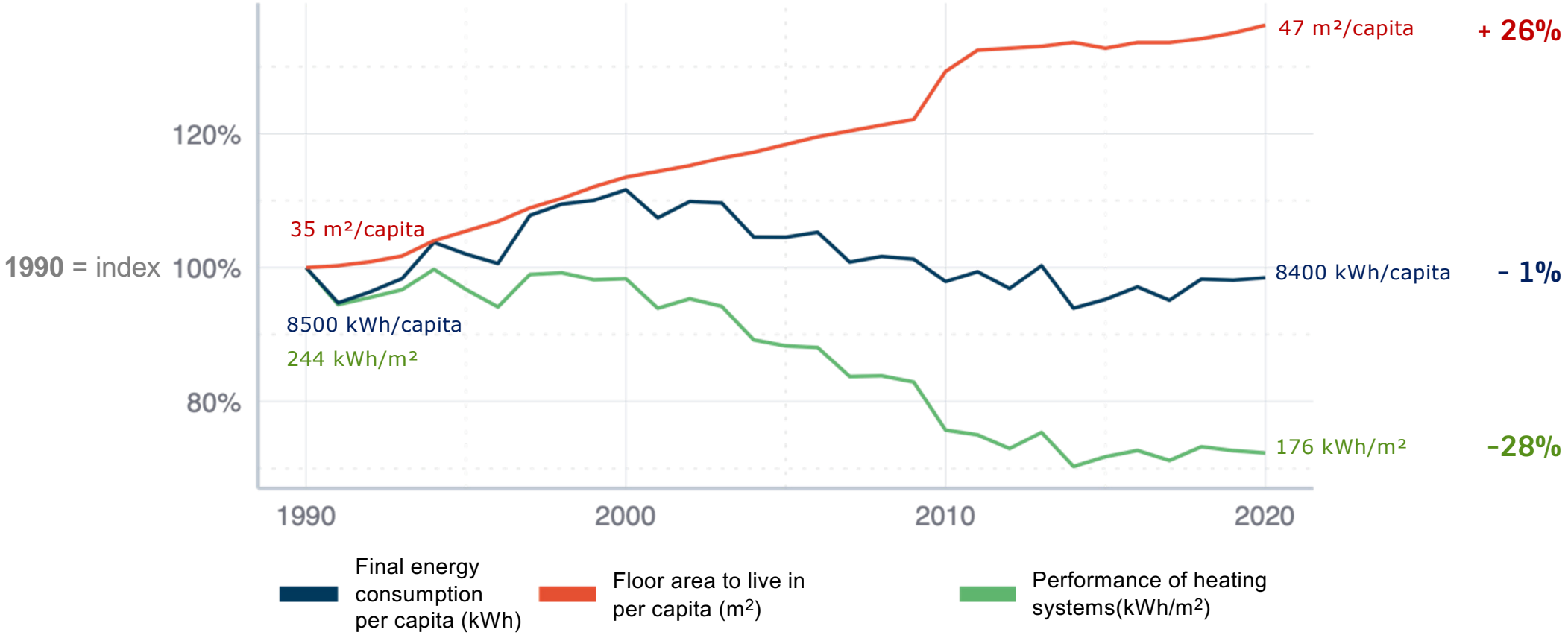
Design and dimensioning

Conditions of use



Sufficiency, essential complement to efficiency

Evolution of heat demand in the residential sector in Germany since 1990



Source: German Federal Statistical Office (2000, 2021) and Working Group on Energy Balances (Arbeitsgemeinschaft Energiebilanzen 2021)

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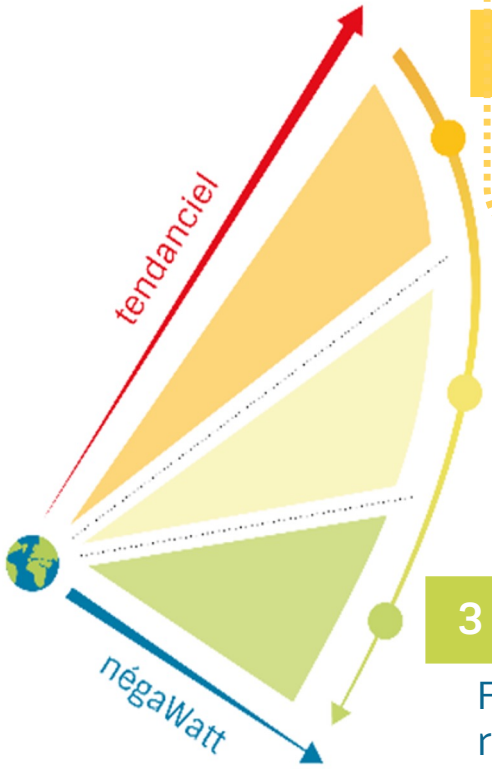
2. **Bottom-up modelling** enables sufficiency to be placed at the heart of the **scenarios** and its role to be assessed

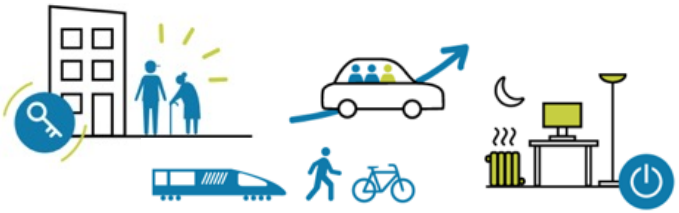
The role of sufficiency: the French nW2022 scenario

Applying the negaWatt approach to France over 2020-2050:



1 Sufficiency

Better design of energy services

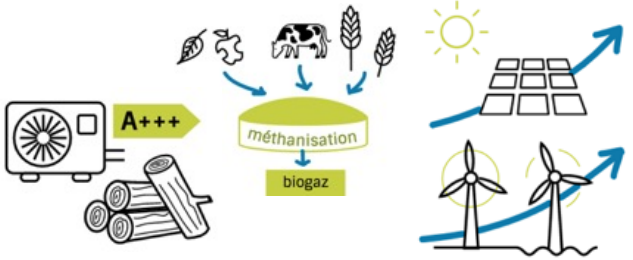


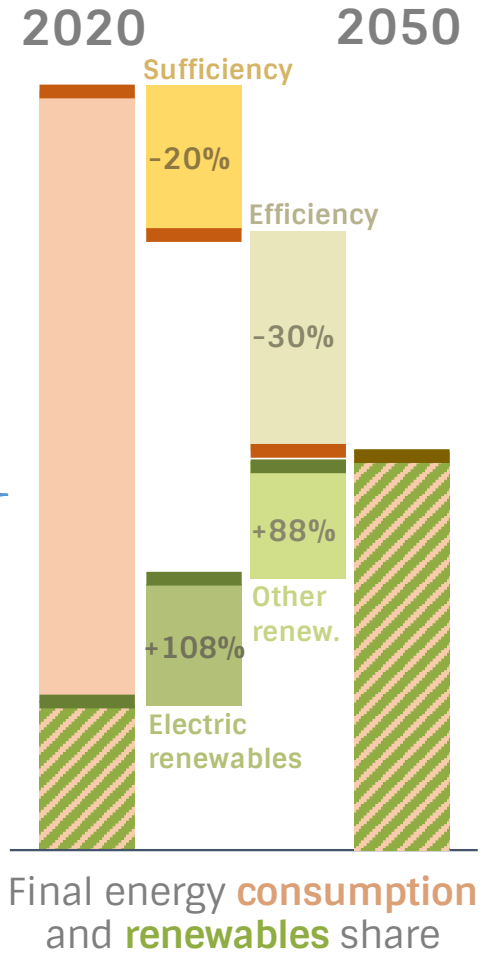
2 Efficiency

Increased performances

3 Renewables

Flow-based resources





Final energy **consumption** and **renewables** share

Impact of sufficiency: the French nW2022 scenario

17 Sustainable Development Goals (SDGs)
of the United Nations (2015)

Quantitative and qualitative scenario assessment matrix

Sufficiency contributes

- **ODD 7** — 100 % local renewables
- **ODD 13** — Carbon neutral footprint
- **ODD 12** — -30 % on raw materials footprint
- **ODD 14** / **ODD 15** — Reduced pressure on biodiversity
- **ODD 3** — Positive health impacts
- **ODD 1** / **ODD 10** — Reduced energy poverty, enhanced social justice
- **ODD 8** — 600.000 net jobs (new economic dynamics)
- **ODD 16** — Reduced tensions

etc.

Sufficiency as a key enabler

Reduced amount of resources + Reduced size / number of equipement

→ Pace and range of **substitution** (and feasibility of investments)

Multiple co-benefits

Raw material needs

Land-use

Water resources

Health

...

→ Environnemental and health **impacts**

Possible shocks

Occurrence and magnitude of shocks

Chains of consequences

Vulnerability of the system to shocks

Various impacts

Sensitivity to residual impacts

→ Socio-economic **resilience** throughout transformation

Sufficiency is likely to enhance the **effectiveness**, **positiveness** and **robustness** of energy transition

Strategies and scenarios (1/2) – France

Short term
- the quickest lever to activate so as to ease constraints
- necessary to address cumulative issues (carbon budget)

Medium term
- sizing effect to find room for manoeuvre
- lasting downward impact on household and business bills

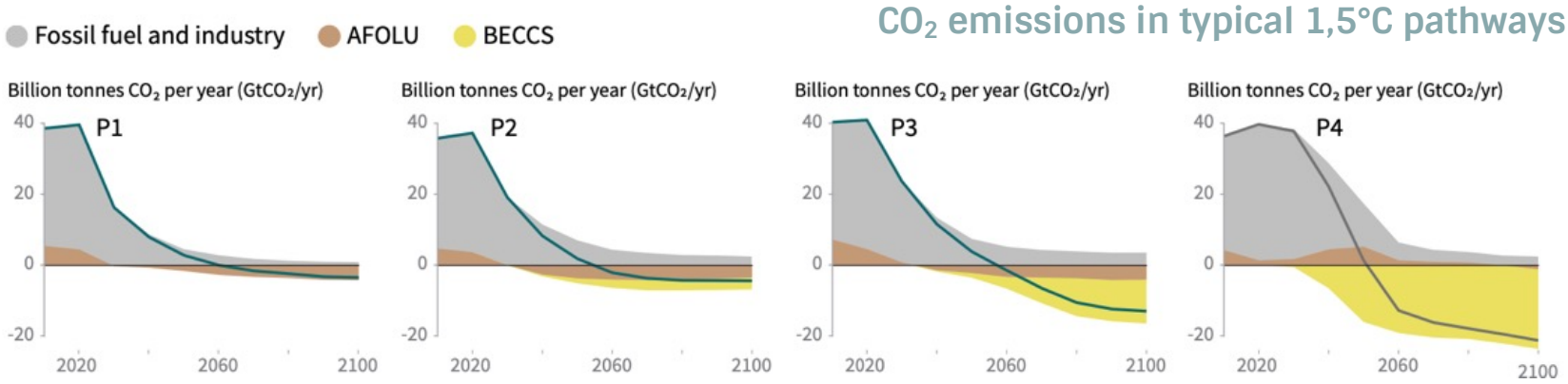
Long term
- structural change to achieve deep decarbonisation
- overall reduction in the ecological footprint and numerous co-benefits

Stratégie nationale bas-carbone	Futurs énergétiques 2050	Scénario négaWatt 2022	TRANSITION(S) 2050	Le plan de transformation de l'économie française
La transition écologique et solidaire vers la neutralité carbone		La transition énergétique au cœur d'une transition sociétale	CHOISIR MAINTENANT AGIR POUR LE CLIMAT	Climat, crises :
One sufficiency based central scenario	Sufficiency as 1 of 3 demand scenarios	Sufficiency based	Sufficiency at the core of 2 out of 4 scenarios	Series of sufficiency related sectorial plans
March 2020	October 2021	October 2021	November 2021	February 2022

Strategies and scenarios (2/2) – World

Special Report 1,5°C
(SR15 – October 2018)

CO_2 emissions in typical 1,5°C pathways



Social innovation, **reduced demand**, improved living conditions, no recourse to technological carbon sinks

Energy intensity, human development, economic convergence, **sustainable and robust consumption** patterns

Rather "usual" societal and technological development, giving priority to production changes over demand reduction

High energy and resource intensity, continued and **widespread mass consumption**, reduction of emissions through technology

6th Assessment Report
(AR6 – WGIII, 2022)

- "Demand-side mitigation can be achieved through changes in **socio-cultural factors**, **infrastructure design and use**, and end-use technology adoption by 2050"
- By 2050, **comprehensive demand-side strategies** across all sectors could reduce (…) GHG emissions globally **by 40–70%** compared to (…) policies announced by governments until 2020.

Scientific Advice– June 2023

- "Pathways with **lower energy and natural resource use** advance the SDGs and energy security and lower other risks compared to pathways that prioritise supply-side technological solutions"

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about needs and wants for sufficiency

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2. **Bottom-up modelling** enables sufficiency to be placed at the heart of the **scenarios** and its role to be assessed

3. Concrete **levers** for sufficiency can be identified, and the corresponding **policies and measures** developed

A wide range of potential policies and measures

Policies and measures

Sufficiency levers

Informing and supporting actions (1) — **Guiding and regulating innovation and markets** (2) — **Changing social norms and practices** (3) — **Regulating and adapting infrastructures** (4)

Servicial

Intensity or duration of use of equipment

Turning off appliances,
Reducing planned obsolescence…

1

Dimensional

Size, nominal capacity of equipment

Adaptation of vehicles to uses,
Floor area of buildings…

2

Organisational

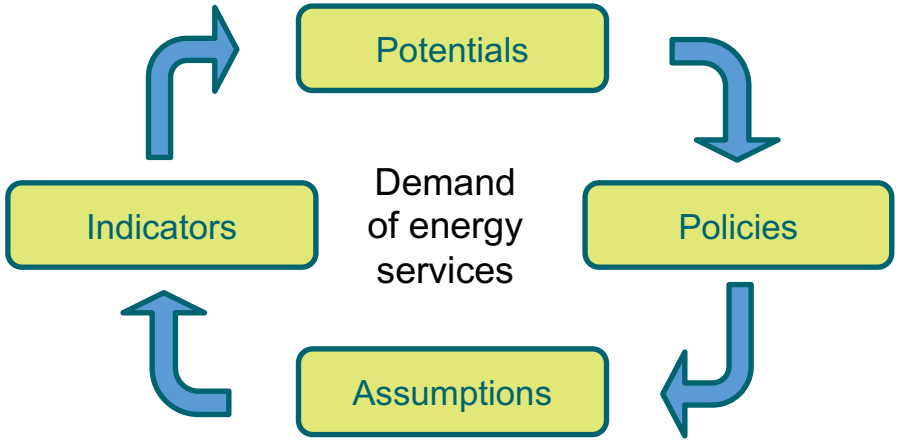
Sharing, collective organisation

Car sharing, teleworking,
Urban planning…

3

Policies to be developed

according to the same principles as the other levers



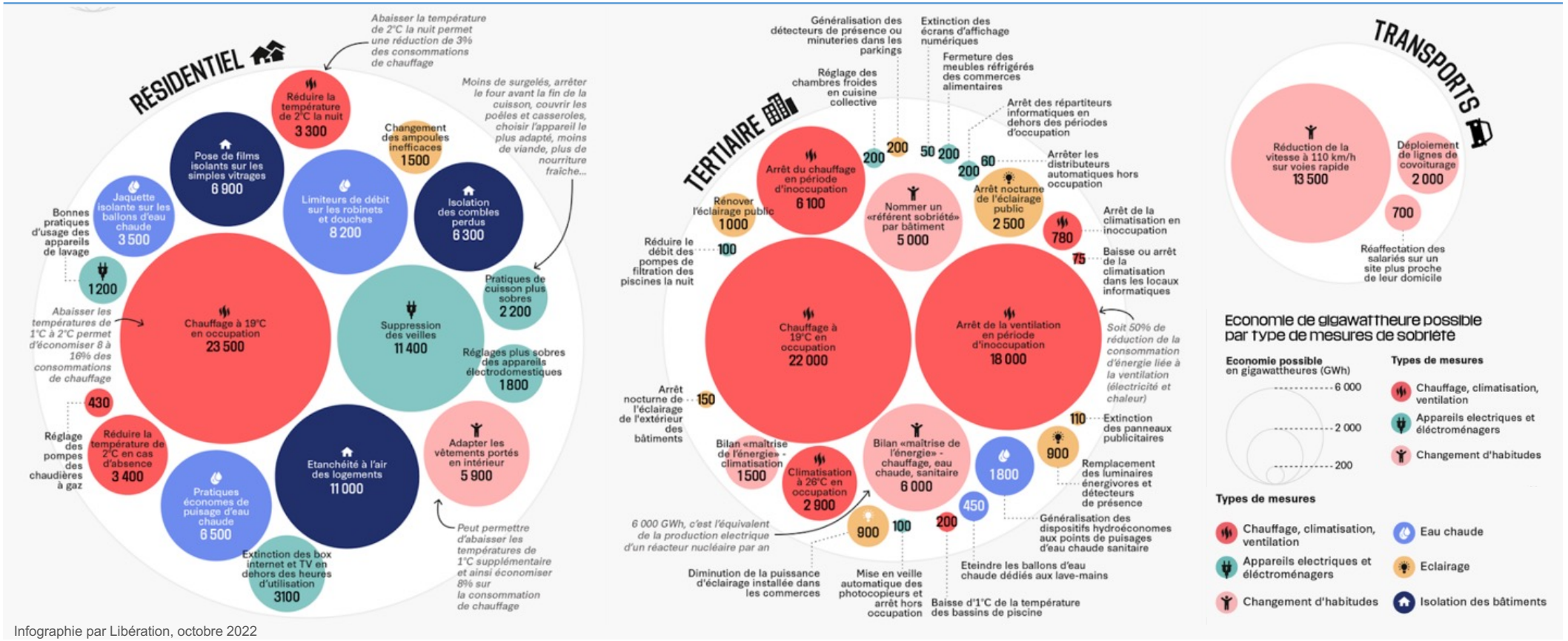
There are hundreds of indentified applicable policies and measures, covering all sectors

energie-suffizienz
Policy Database

Short term: French government's sufficiency plan

Proposals by négaWatt : -20% on gas
Plan delivered 5-10% -17% on electricity

Short-term potential that can be mobilised, taking into account the capacity of concerned players and assuming effective processes



Infographie par Libération, octobre 2022

Medium-long term: the French nW2022 scenario

Impact of sufficiency on final energy: **-10% by 2030** **-20% by 2050**

Medium- to long-term potential through the structural and progressive implementation of sufficiency

Buildings

Stabilisation of m² / inhabitant and number of people per dwelling

Reduction in the proportion of new single-family homes

Development of **teleworking**, controlled growth in commercial space

Reduction of **new built** (priority to rehabilitation)

Moderate rate and size of **equipment**

Priority to **bio-based materials** (new build, retrofit)

Mobility

Reduction of **distances covered**

Modal shift and **reduction in air travel**

Increased **occupancy rate** (e.g. 2 per car average)

Reduction of **speed limits**

Freight

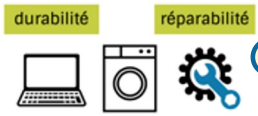
Reduction in **transported tonnages**

Modal shift

Better **loading**

Industry

Reduced production of **steel**, **cement**, **plastics** and energy consumption



More durable, repairable and repaired **products**

A strog increase in **recylcing rate** (metals, glass, plastics)

Agriculture

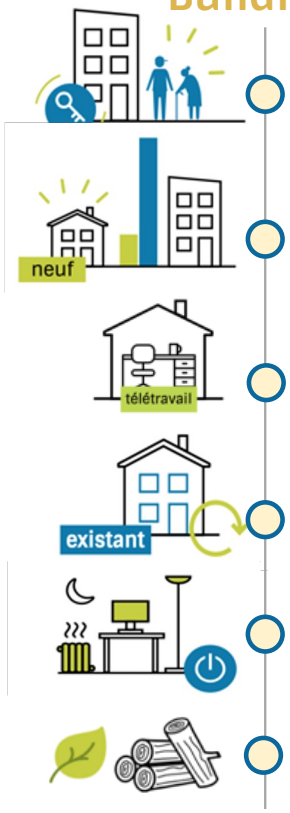
Strong reduction of **food waste**

Reducing the amount of **animal protein** in diets

Medium-long term: building assumptions

Working on sobriety indicators and levers enables us to identify the factors likely to have an impact

Buildings



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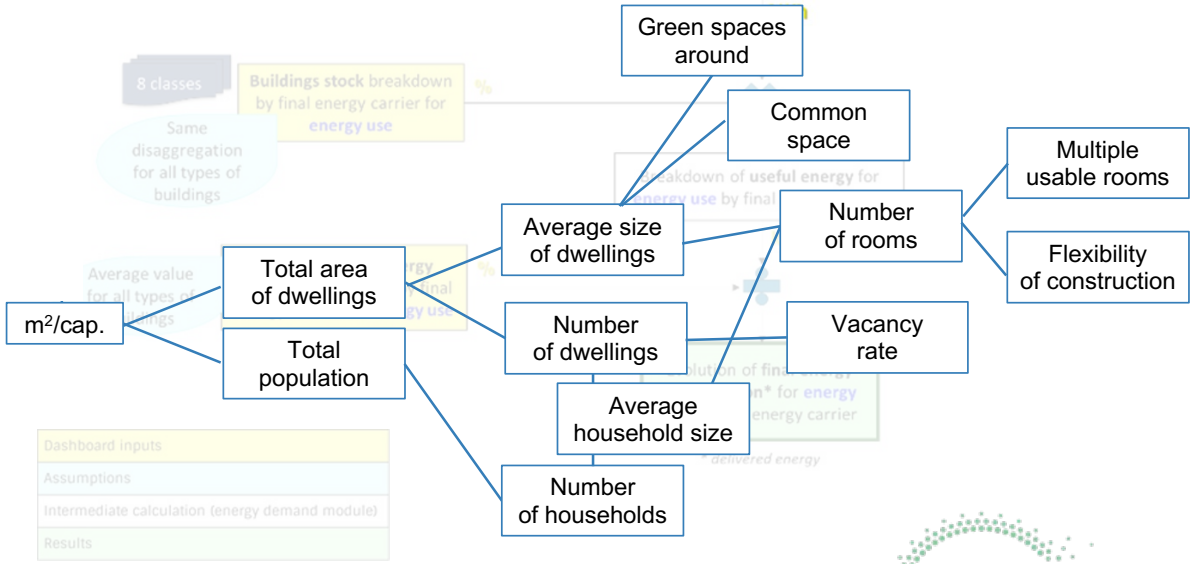

Ongoing work to refine the methodology in FULFILL (EU Horizon 2020 research project)

FULFILL

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4. Sufficiency is a powerful lever for rethinking the **economy** from the perspective of **sustainable activity** and **social justice**

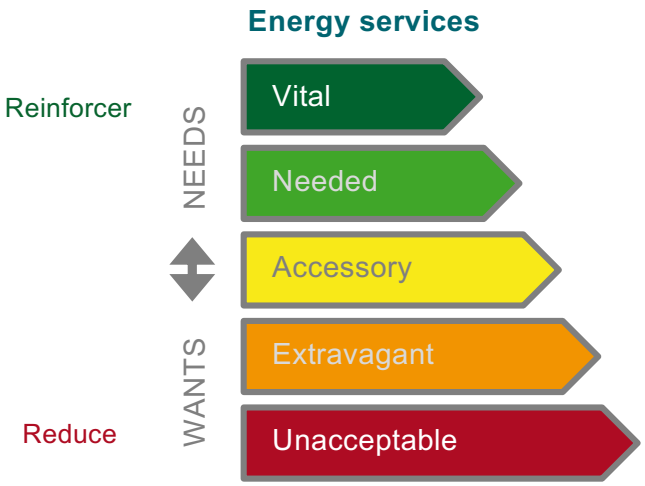
Sufficiency, fairness, solidarity… and a new economy?

ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP

(AR6 – WGIII, 2022)

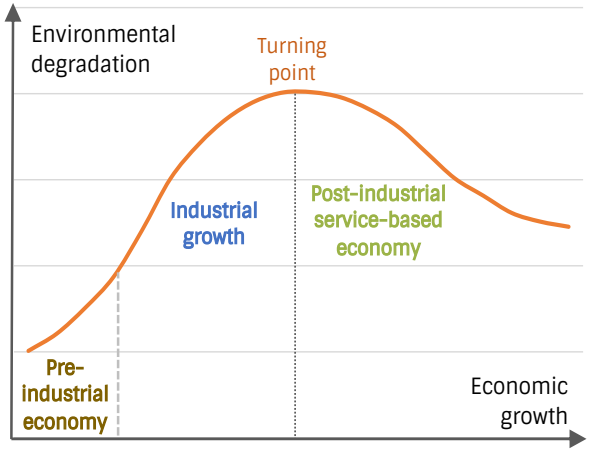
"**Sufficiency** policies are a set of measures and daily practices that **avoid demand for energy**, materials, land and water while **delivering human well-being** for all **within planetary boundaries**."

Within collective limits, ensuring a fairer distribution of access to services

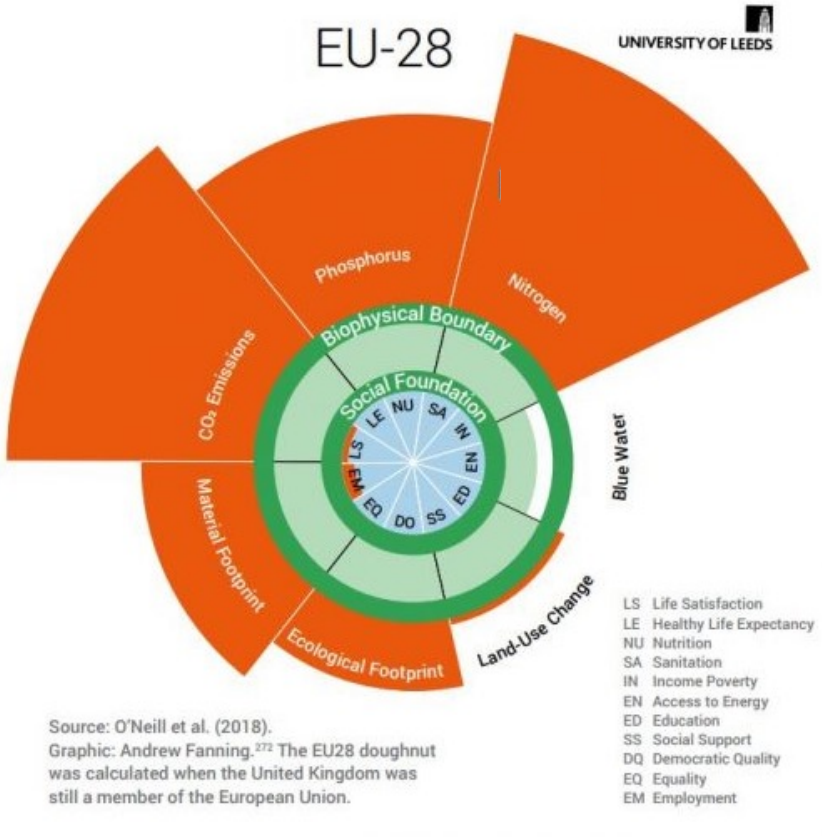


Rethinking activities, between the **ceiling** of environmental limits and the **floor** of decent living conditions

Aligning value creation with resource protection and sharing rather than predation and destruction



Sufficiency and the doughnut economy



Source: University of Leeds, 2018

The "doughnut economy" concept
(Raworth et al.)

Source: based on K. Raworth, 2022

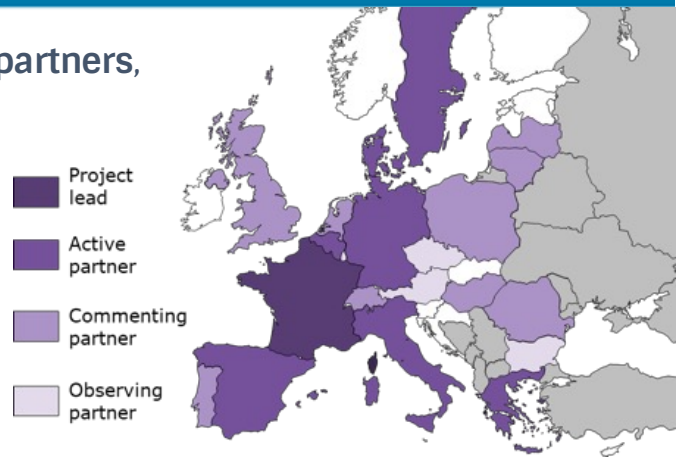
Need for collective discussion to establish thresholds for energy services that are compatible with these limits

A European scale application: the CLEVER scenario

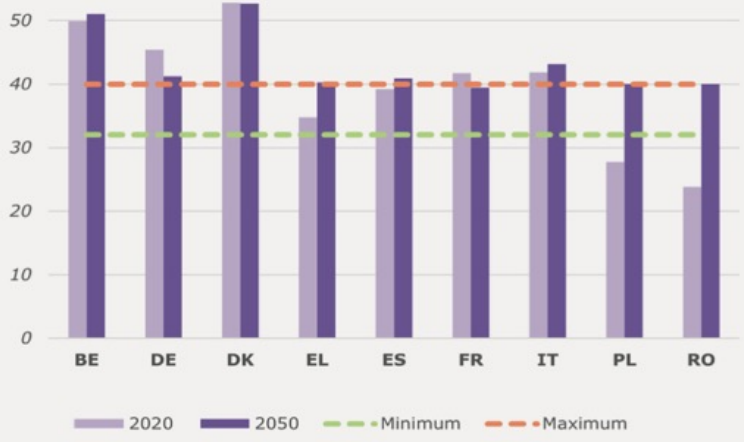
Clever | A Collaborative Low Energy Vision for the European Region

European scenario:
- carbon neutral by 2045
- 55% less final energy by 2050
- with 100% renewables feed

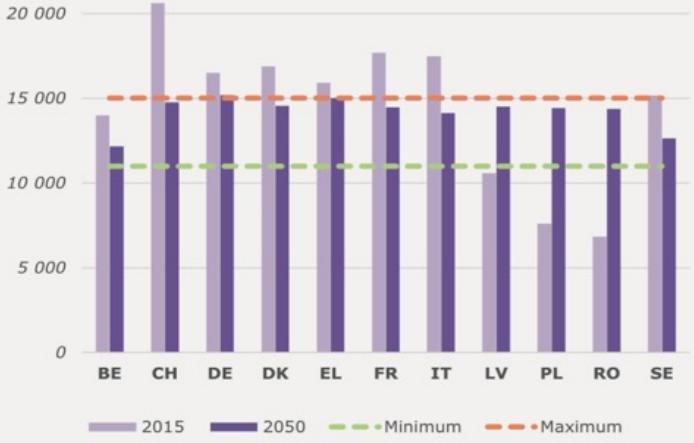
- A **bottom-up construct** with a **network of 25 partners**, based on the harmonisation and integration of national trajectories
- Closer economic and social conditions within Europe through **corridors of convergence** on energy service levels
- Joint definition of **high**/**low** **thresholds** towards which to converge



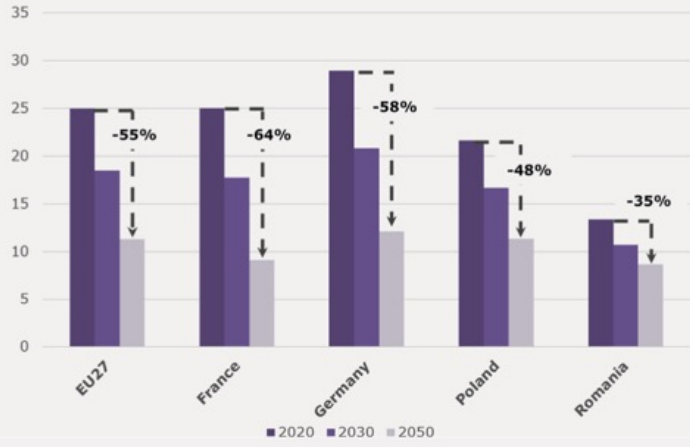
Distance covered per capita in selected countries (km/./an)



Floor area of housing per capita in selected countries (m²/cap.)



Per capita final energy consumption in selected countries (MWh/cap./year)



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3. Concrete **levers** for sufficiency can be identified, and the corresponding **policies and measures** developed
4. Sufficiency is a powerful lever for rethinking the **economy** from the perspective of **sustainable activity** and **social justice**
5. When the conditions for **public debate** allow it, **citizens** are more ready for sufficiency than **decision-makers** seem ready to believe

The emergence / eruption of sufficiency in public debate


Le Monde

Stade de France : des défaillances en chaîne

URGENCE CLIMATIQUE
LE DÉFI DE LA SOBRIÉTÉ

FRUGALITÉ : UN SI NÉCESSAIRE DÉBAT

Ukraine
L'aviation, une des clés de l'avancée russe dans le Donbass

Justice
La compétence universelle entravée

Politique
La note interne qui critique la campagne de Yannick Jadot

Force ouvrière
La réforme des retraites, dernier combat d'Yves Veyrier

Elysée
Le mandat en suspens d'Emmanuel Macron

OTAN
En Roumanie, les soldats français en alerte

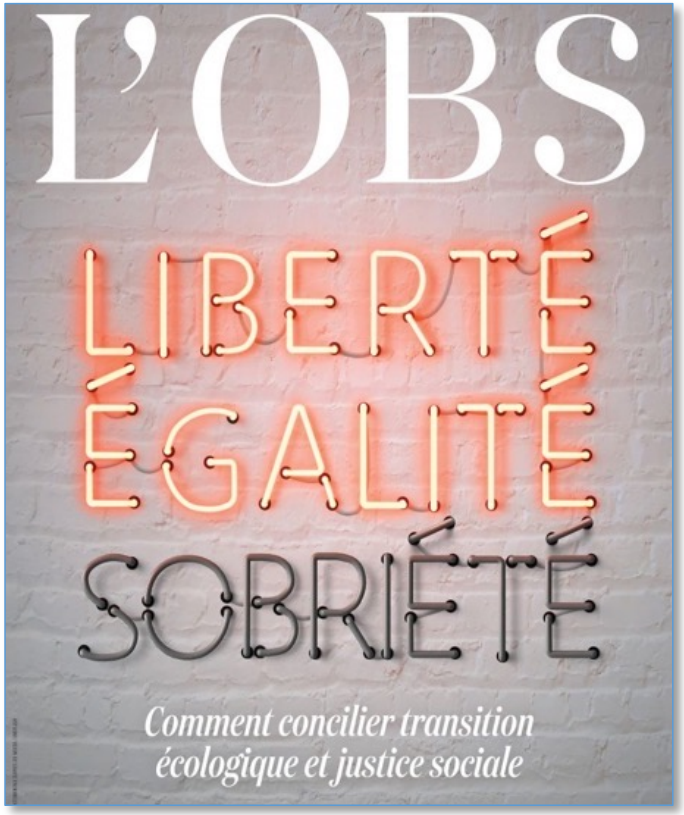
Culture
Les jeunes réinventent la lecture

ENVIE DE VIVRE 24H DANS LA PEAU D'UN CHAMPION ?

VISA

Le Monde, 31 May 2022

Joint oped, CEOS of the three major French energy companies (TotalEnergies, EDF, Engie), ***Journal du Dimanche***, 26 June 2022



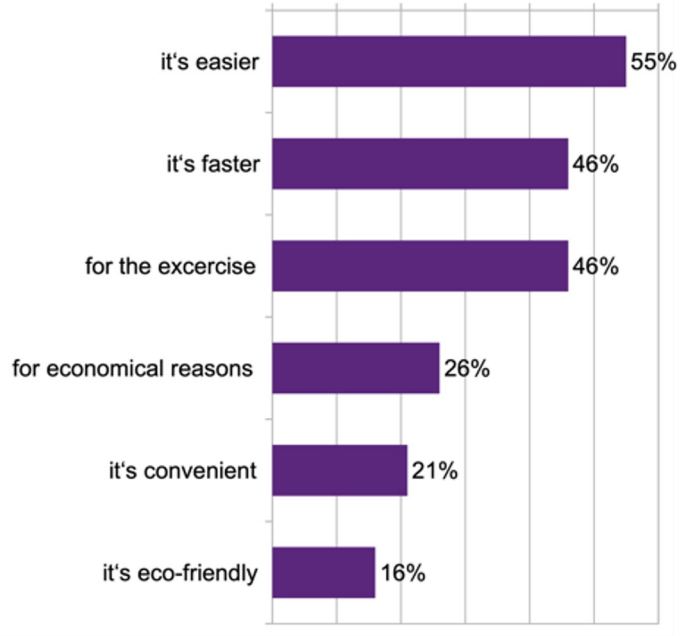
L'Obs, 13 September 2022

Sufficiency as a core democratic stake

Key conditions:

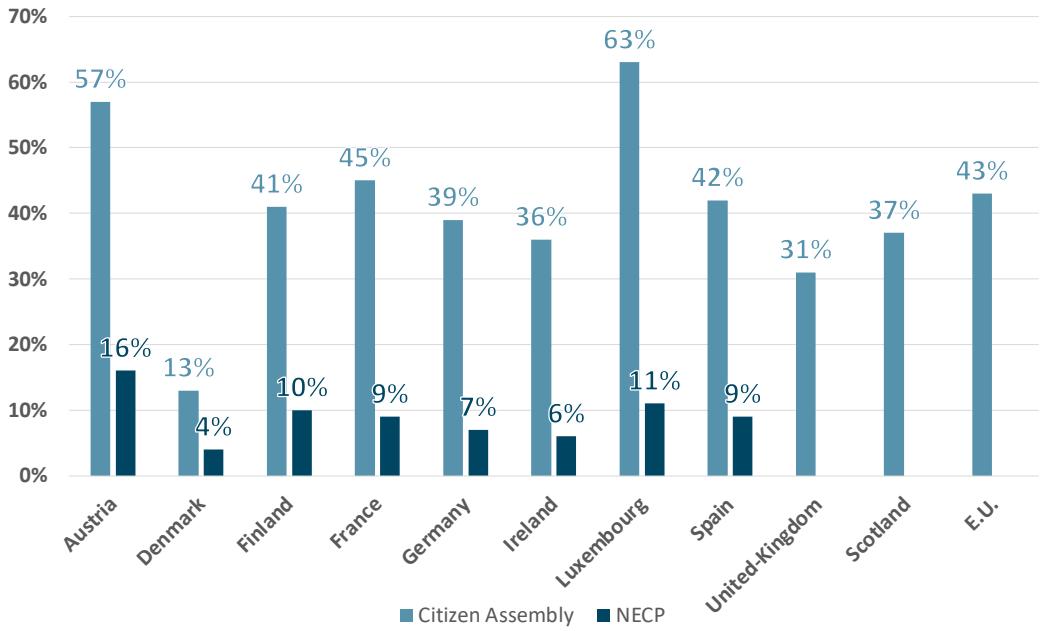
1. Commit to deliver on co-benefits
2. Give effective access to alternatives
3. Bring explicit answers to social justice issues

Why do people cycle in Copenhagen?



Reference: City of Copenhagen, 2019

Share of sufficiency policies in total climate-mitigation policies in citizen assemblies and National Energy and Climate Plans (NECPs)



Source: article *in* Energy Research & Social Science, septembre 2023

https://www.negawatt.org

Resources on the nW approach and the French négaWatt scenario

Clever

A Collaborative Low Energy Vision for the European Region

https://clever-energy-scenario.eu

The first sufficiency-based energy transition scenario for Europe

FULFILL

Fundamental decarbonisation through sufficiency by lifestyle changes

https://fulfill-sufficiency.eu

The first 100% sufficiency-focused EU Horizon 2020 project

Thank you for your attention!

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