



30 years ago | 30 years from now

A WORLD OF ENERGY REVOLUTIONS

New energy demand trends in the North and South

A WORLD OF ENERGY REVOLUTIONS

- 30 years of energy and climate expertise to support clients and partners
- 30 years of data science, modelling and forecasting, intelligence and research
- 30 years seems like a perfect timing for observing our moving world

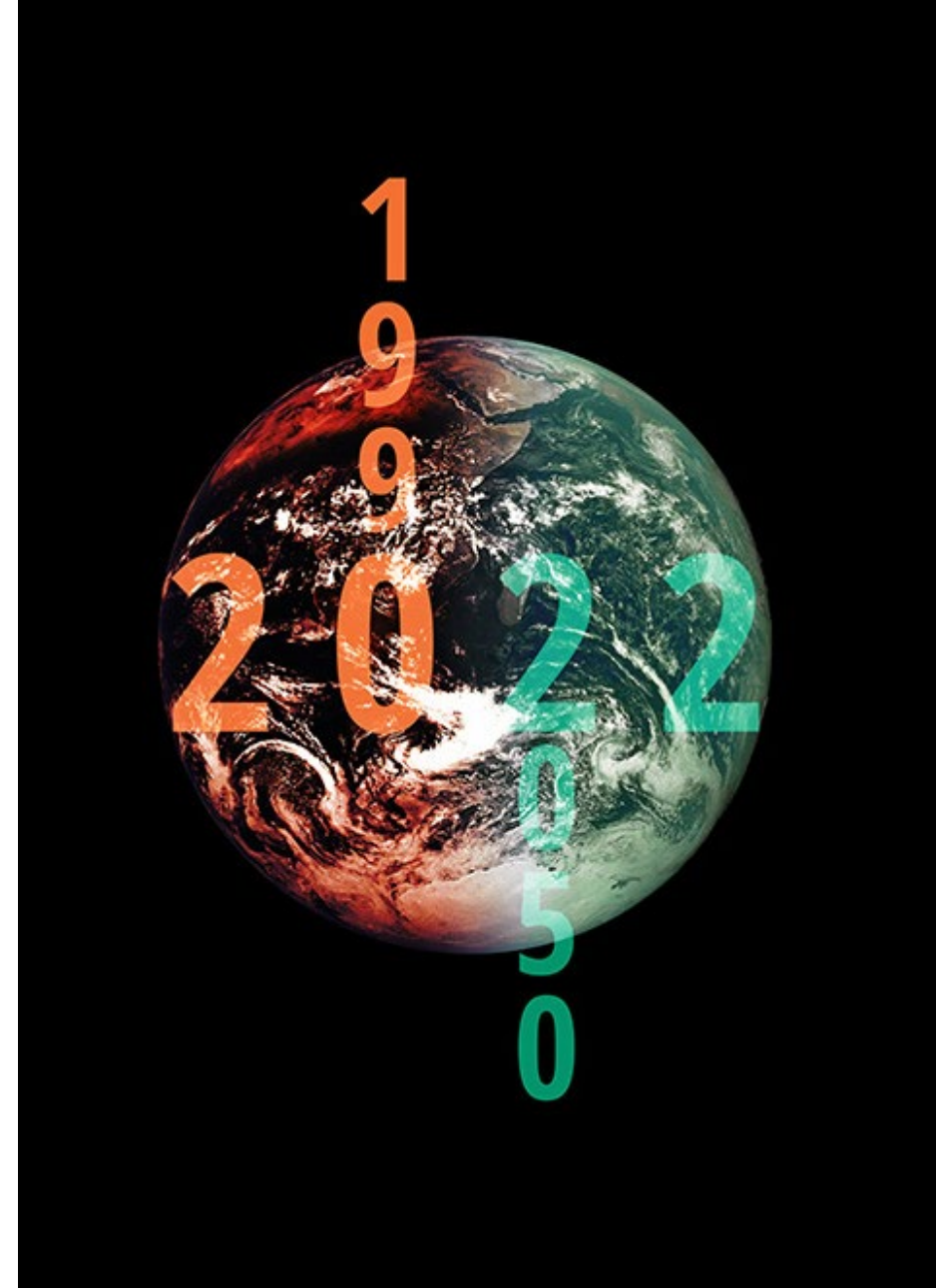
CONFERENCES SCHEDULE

Replay available - **Sixty years of global economy and energy transitions**

Replay available - **Energy systems in a deep decarbonisation future**

March 22nd - New energy demand trends in the North and South

March 29th - The energy transition, a challenge for all of us!



Marie ROUSSELOT

Energy Efficiency & Demand Department Manager

Enerdata



Sixty years of global economy and energy transitions

SPEAKERS TOPICS

- The concept of energy efficiency and its multiple benefits in the North and South
- The recent energy efficiency trends in Europe and Latin America, and the challenges these two regions face to further reduce their energy consumption and greenhouse gas emissions.
- Some examples of energy policies being implemented, and how they may conflict with the achievement of poverty reduction and decarbonisation objectives
- The Transition(s) to 2050 scenarios proposed by ADEME: different possible futures for French society, based on contrasting lifestyles and energy demand

ROUND TABLE



**PLEASE,
ASK YOUR QUESTIONS
IN THE Q&A BOX
DURING THE PRESENTATIONS
AND ROUND TABLE!**



SPEAKERS



Laura SUDRIES

Project Manager
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Bruno LAPILLONNE

Co-founder and Scientific Advisor
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Valerie QUINIOU-RAMUS

Prospective and Research
Executive Director
ADEME



Wolfgang EICHHAMMER

Head of the Competence Center
"Energy Policy and Energy
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What does the concept of energy efficiency mean?

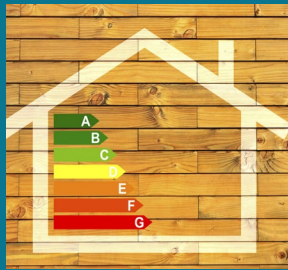
Laura SUDRIES

Enerdata

What is energy efficiency ?

- **Energy efficiency improvement** is about reducing the amount of energy used to satisfy a **given service** (indoor temperature level, lighting, cement production etc.), through different types of consumer actions.

Examples of energy efficient consumer actions



Insulation



Efficient appliances



Public transport

- **Energy efficiency indicators** are used to assess the progress in energy efficiency and to measure energy savings.

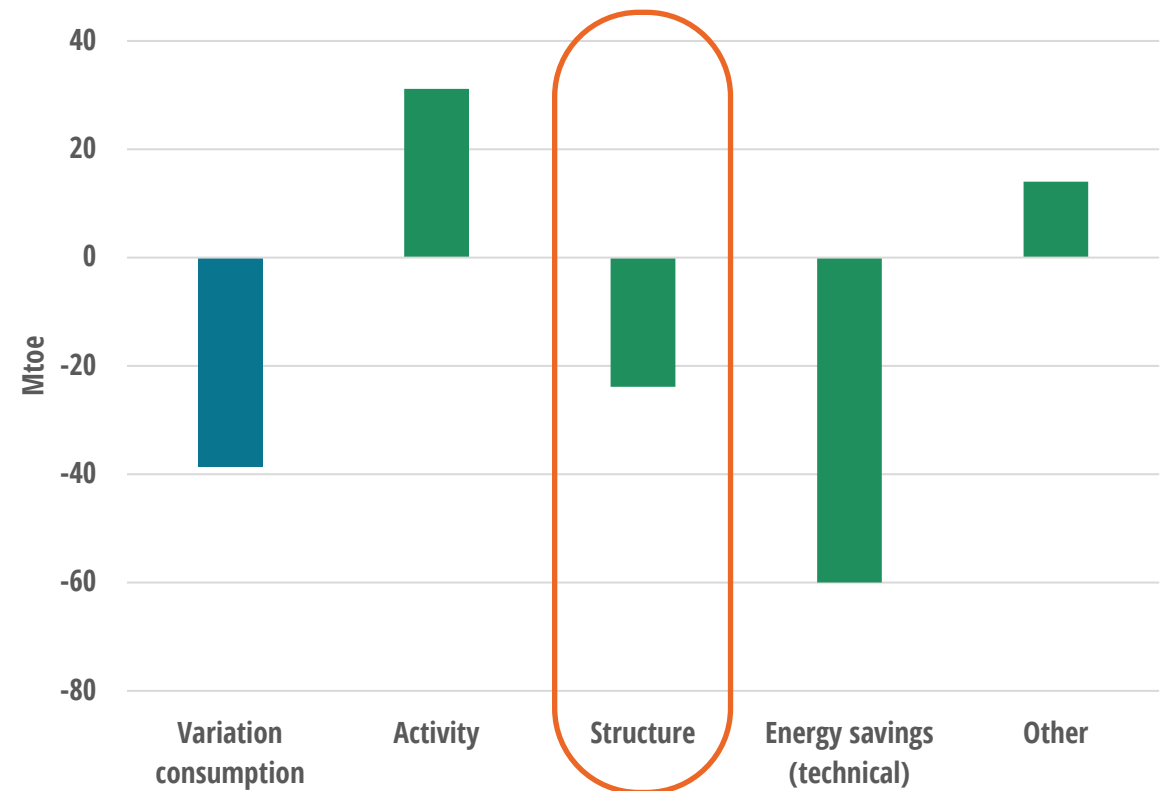
Why is monitoring energy efficiency at the macro level not an easy task?

The usual macro-level indicators such as energy intensity are purely descriptive.

Observed trends can be influenced by many other factors than energy efficiency (e.g., structural changes, behavioural changes).

→ Need for **appropriate methods and indicators** to measure energy efficiency improvements, such as ODYSSEE Energy efficiency indicators

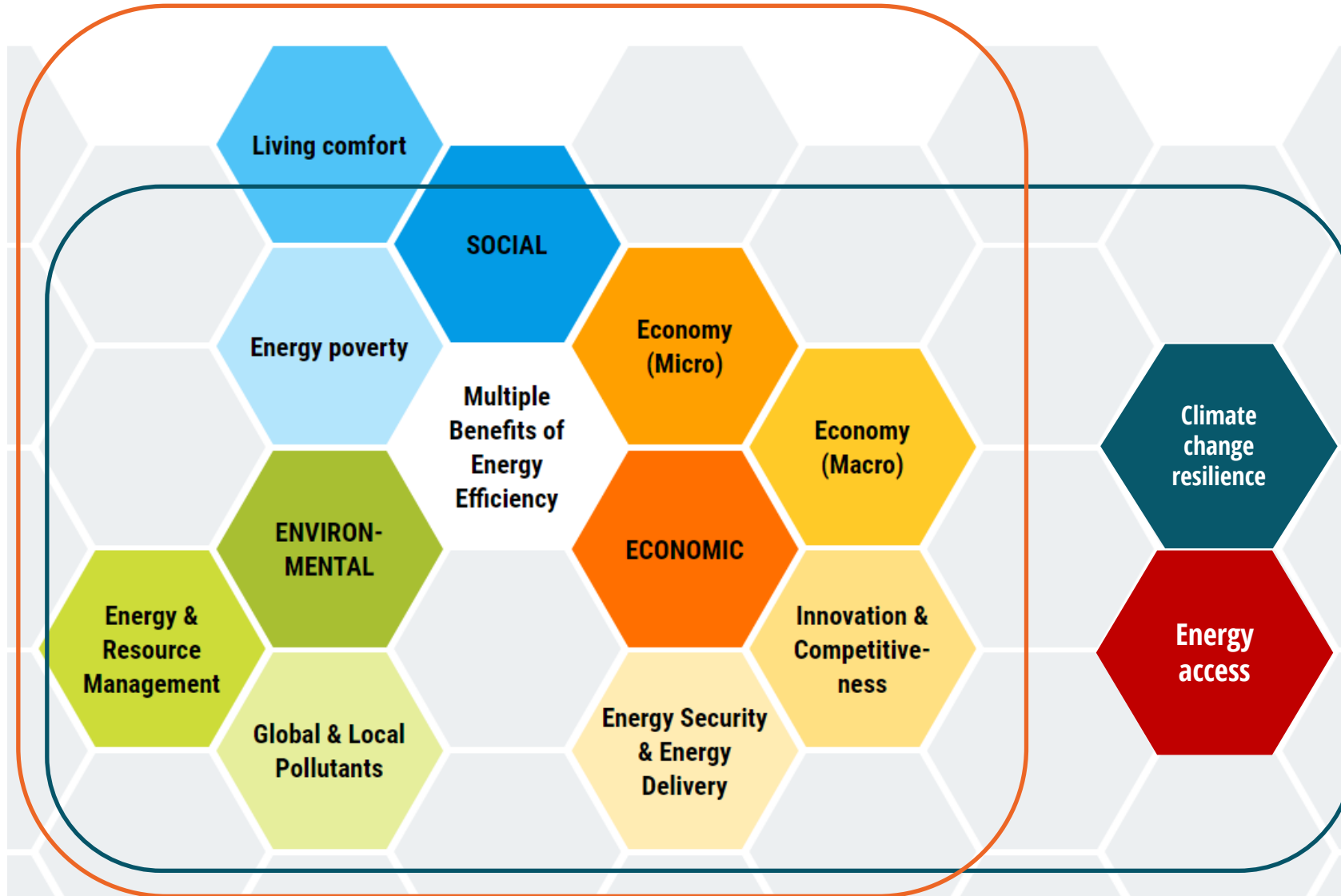
Decomposition of industry consumption variation 2000-2019 (EU)



Source: ODYSSEE, <https://www.indicators.odyssee-mure.eu/decomposition.html>

The multiple benefits of energy efficiency

Northern countries



Southern countries



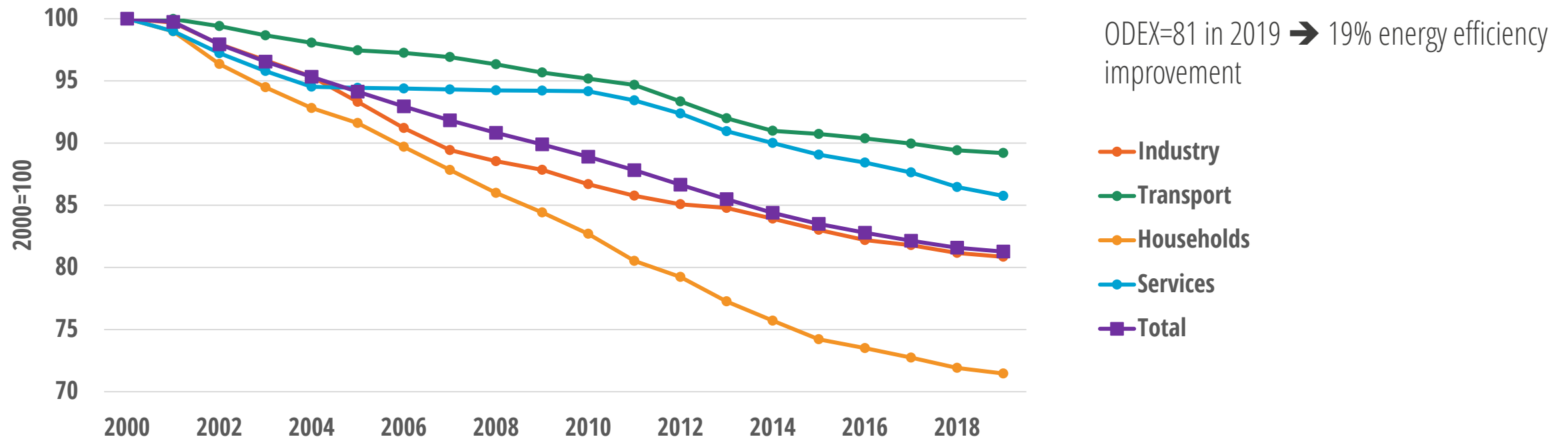
Energy efficiency trends and challenges in Europe and Latin America

Bruno LAPILLONNE

Enerdata

Energy efficiency progress in the EU

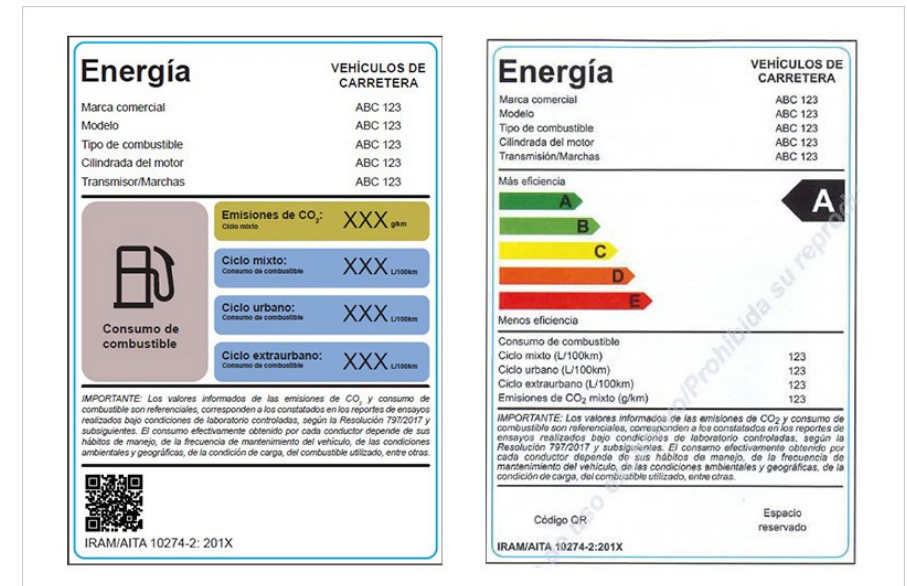
- Energy efficiency has improved by 19% between 2000 and 2019 → this has resulted in almost 200 Mtoe of energy savings, 40% which come from households.
- However, the rate of improvement has slowed considerably since 2014 (from 1.2%/yr before 2014 to 0.7%/yr), mainly due to twice as slow progress for households and cars.



Source: ODYSSEE, measured with ODEX (Odyssee Energy Efficiency Index)

Energy efficiency trends in Latin America

- Latin America is generally less advanced than Europe. However,
 - policy measures have been implemented
 - ≈ half of the countries have improved their energy efficiency since 2010
- Focus on household appliances: 3/4 of the countries with energy efficiency standards
- Decrease of the average consumption per household in almost all countries
 - replacement of biomass by more efficient fuels for cooking, the dominant end-use in the household consumption
- Road transport
 - Accounts for ≈ 35% of the consumption
 - Significant energy efficiency improvements > 2%/year in half of the countries



The main challenges of Energy Efficiency



TRANSPORT

- Modal shift
 - long process implying large investments



HOUSEHOLDS

- Energy bill reduction and comfort increase :
 - energy efficiency
 - energy substitutions



INDUSTRY

- Energy efficiency investments driven by
 - market forces
 - regulations (e.g motors)

EUROPE

Far from succeeding in the evolution of existing patterns, despite policy commitments and targets

Housing retrofitting
Better tackling the barriers

LATIN AMERICA

- A more difficult challenge due to:
- The lack of rail infrastructures in most countries
 - The predominance of road transport
- Cooking improvement:
- Switching from traditional to modern fuels
 - Greater use of electricity
- Some regions with large heating and cooling needs face the same issues as Europe

Same challenge for both regions



How to make Energy (Efficiency) Policies work in the North and South

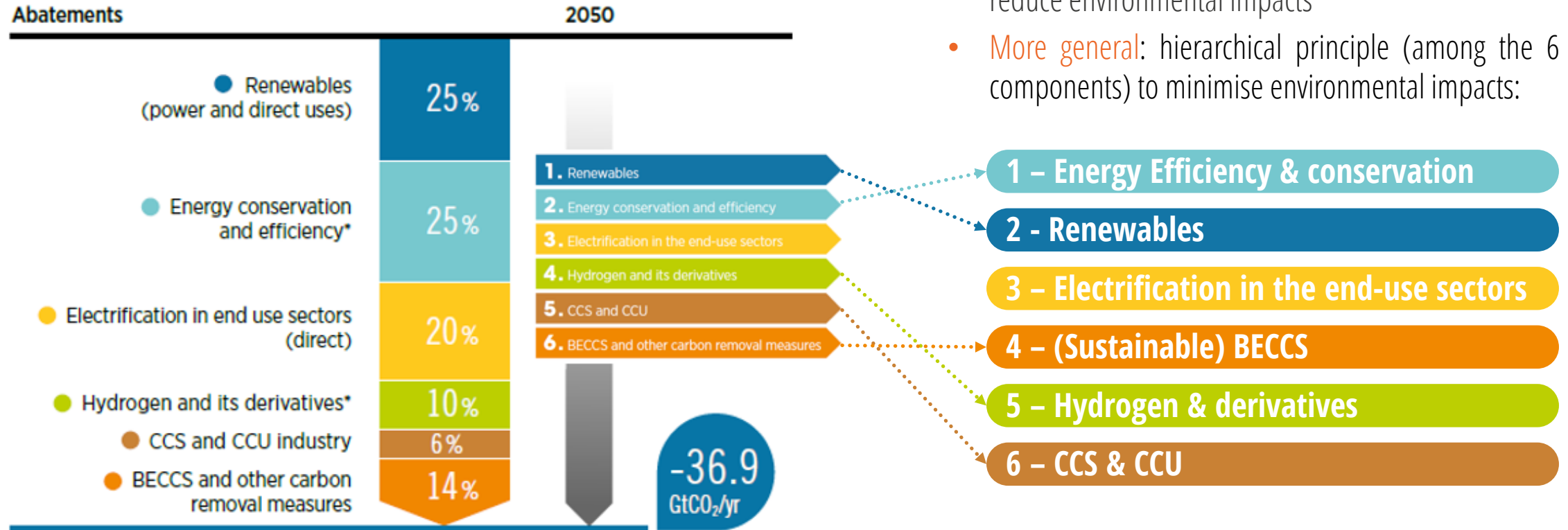
Wolfgang EICHHAMMER

Fraunhofer Institute for Systems and Innovation Research ISI, Karlsruhe, Germany

Utrecht University, Netherlands

What are the main levers worldwide to reach climate neutrality?

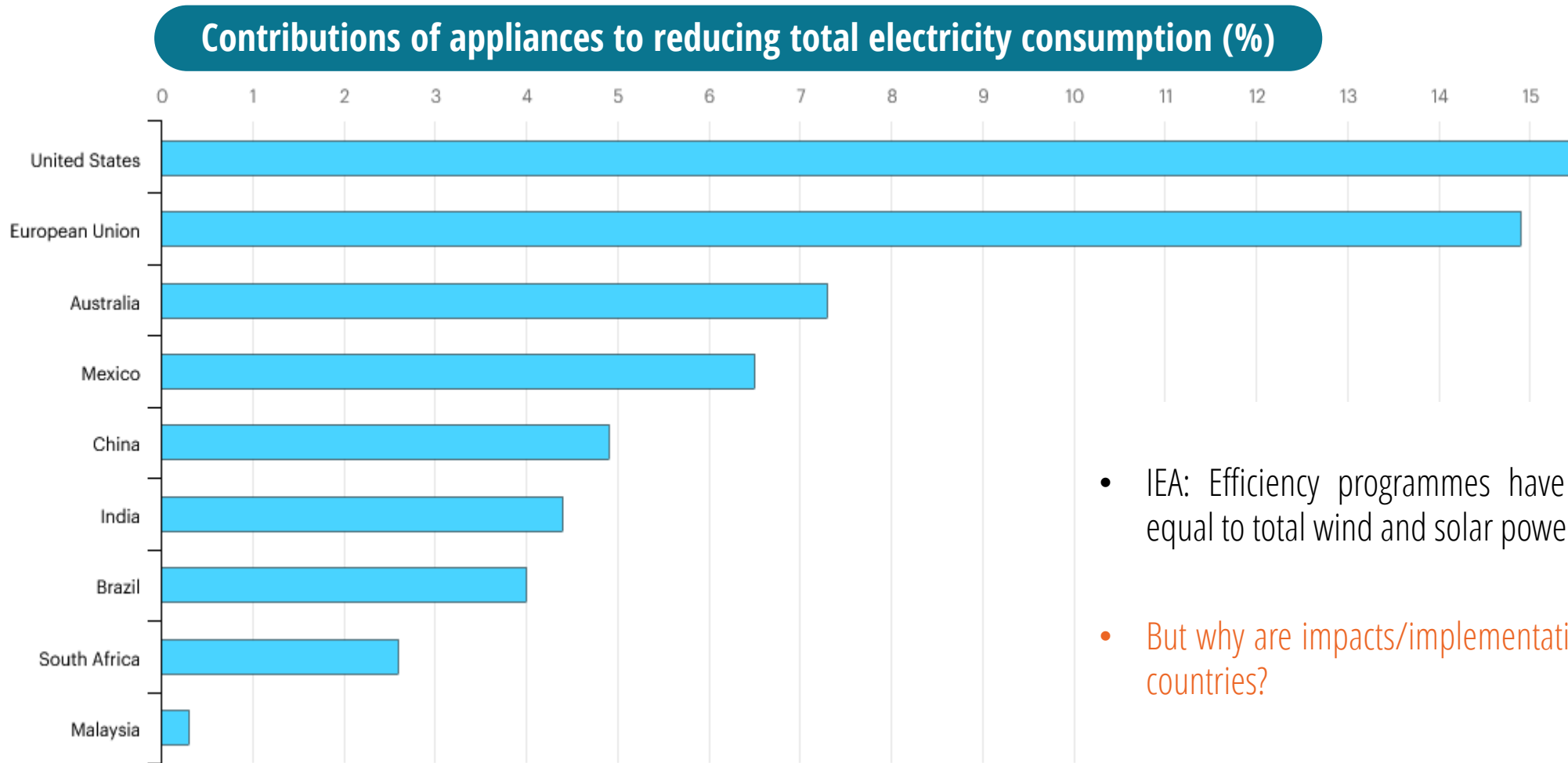
Six components of the energy transition strategy: Energy Efficiency First



- **Energy Efficiency First Principle**: save resources and reduce environmental impacts
- **More general**: hierarchical principle (among the 6 components) to minimise environmental impacts:

Source: IRENA (2021), World Energy Transition Outlook

Energy efficiency standards and labelling programmes



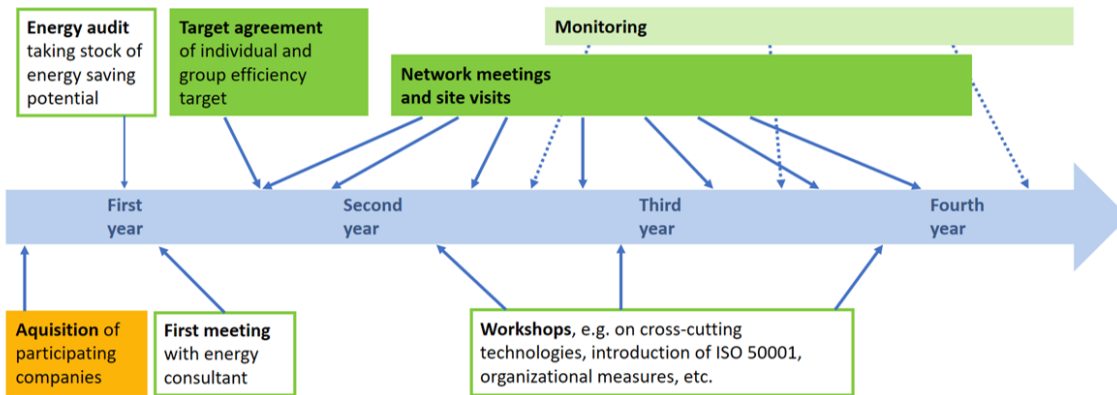
- IEA: Efficiency programmes have avoided consumption equal to total wind and solar power generation
- But why are impacts/implementation very different across countries?

Source: IEA, <https://www.iea.org/reports/energy-efficiency-2021/executive-summary>

Learning Energy Efficiency Networks / Climate Networks in Industry

What is an Energy Efficiency Network?

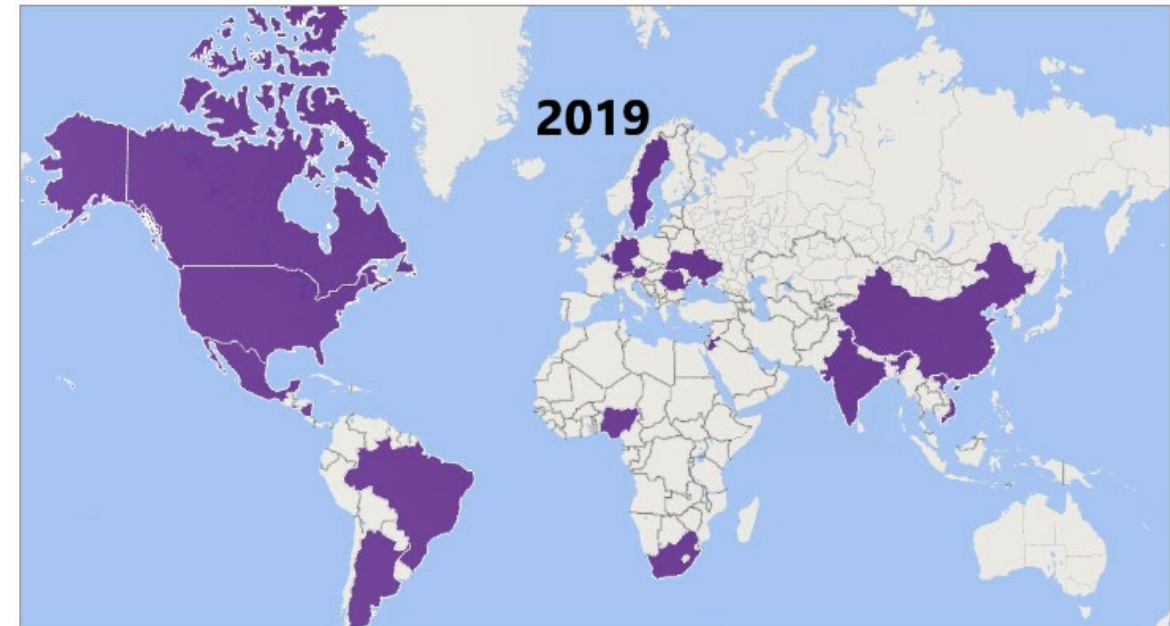
Energy Efficiency Network (EEN): pool of companies whose energy managers meet regularly to **share experiences on energy savings and to implement solutions**. The **exchange of experience is voluntary but structured**.



Source: based on IPEEC 2017

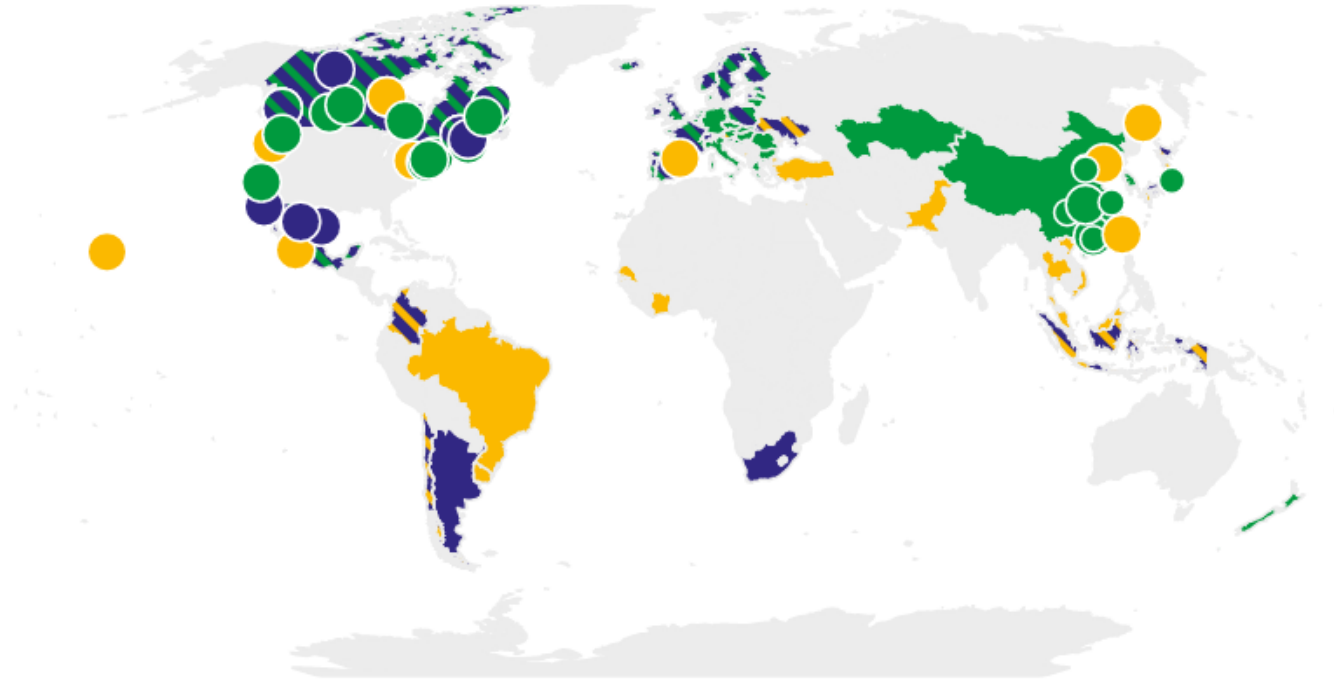
Coverage / dynamics

- Learning Energy Efficiency Networks / Climate Networks in Industry implemented in 20 countries since 1987
- Number of countries doubled in the last 5 years
- How can they spread widely?



Carbon pricing : a worldwide success but...

Summary map of regional, national and subnational carbon pricing initiatives



- ETS implemented or scheduled for implementation
- ETS or carbon tax under consideration
- ETS implemented or scheduled, ETS or carbon tax under c...

- Carbon tax implemented or scheduled for implementation
- ETS and carbon tax implemented or scheduled
- Carbon tax implemented or scheduled, ETS under consider...

...How can we promote **energy efficiency policies** in countries with a large share of poor population who benefit from subsidies on energy prices?

Source: IEA, <https://www.iea.org/reports/energy-efficiency-2021/executive-summary>



The Transition(s) to 2050 scenarios in France

Valerie QUINIOU-RAMUS

ADEME



S1 FRUGAL GENERATION

Forced Frugality

3x less meat

Local based

Medium sized towns
and rural areas

Massive renovation

Low-tech

New indicators of prosperity



S2 REGIONAL COOPERATION

Sustainable lifestyles

Managed Mobility

Cooperation between regions

Sharing economy

Open Governance

Targeted
Reindustrialisation



S3 GREEN TECHNOLOGIES

Decarbonisation Technologies

Demolition/reconstruction

Metropolitan Areas

Exploited Biomass
Hydrogen

Green Consumption

Minimum regulation



S4 RESTORATION GAMBLE

Mass consumption

Urban sprawl
Intensive agriculture
Artificial Intelligence

Uncertain Technologies

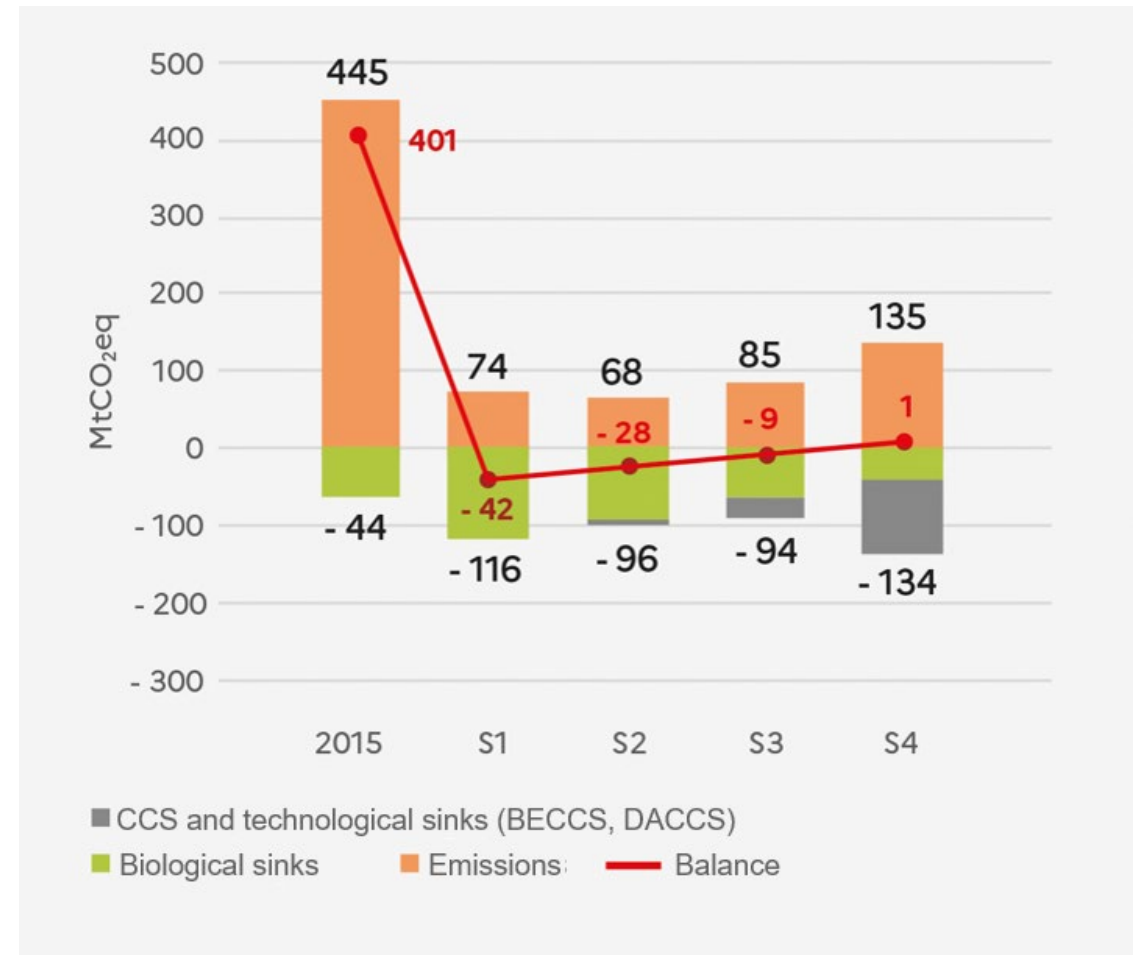
CO₂ capture from the air

Globalised Economy

Carbon neutrality, a difficult road

- We **must act immediately** because the social and technological transformations to be carried out are far-reaching.
- Achieving neutrality depends on major human or technological gambles that differ depending on the scenario.
- Two scenarios appear riskier:
 - Scenario S1 - Frugal Generation: highly-socially divisive regarding its desirability.
 - Scenario S4 - Restoration Gamble: high-risk of technological feasibility.

Balance of CO₂ emissions and sinks in 2015 and 2050



Sufficiency: how far can it go?

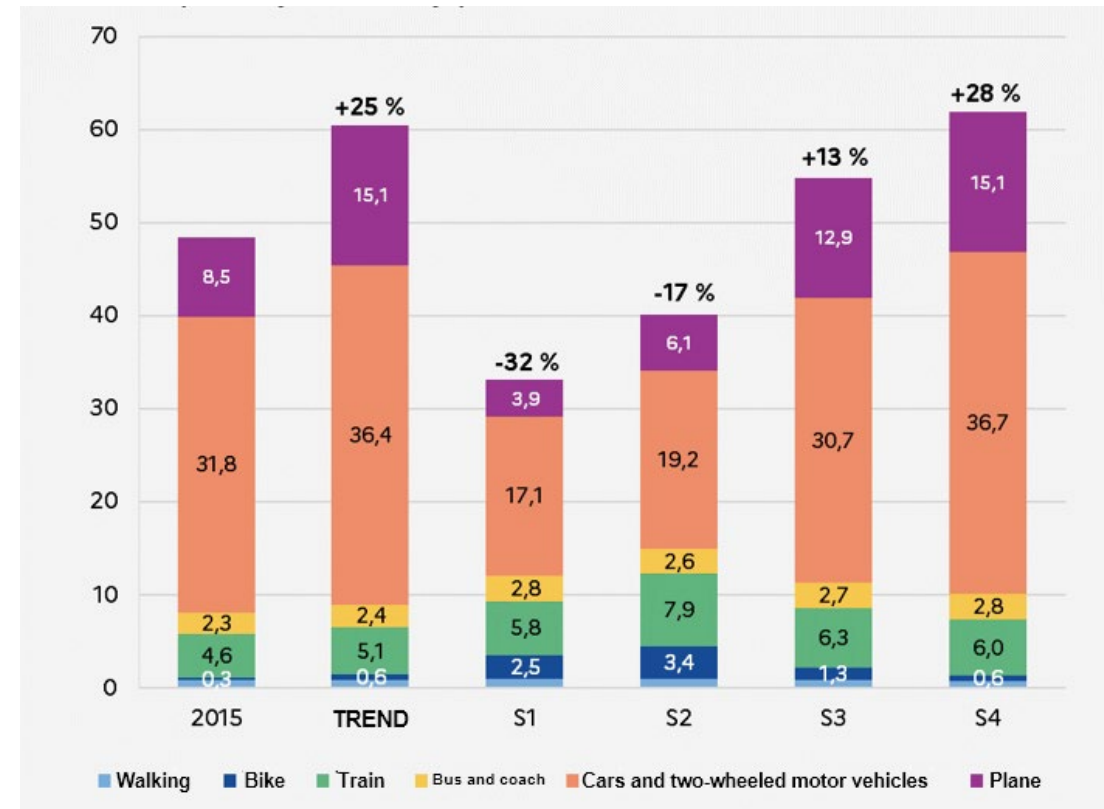
- **S1 and S2**: widespread adoption of moderate energy consumption by changing socio-economic development policy.
- **S3**: based on technology, limited use of energy sufficiency measures.
- **S4**: no consumption restraints, risky headlong rush, huge amounts of energy to remove CO₂ from the atmosphere.

Sufficiency collides with the dominant mode of consumerist thinking. What seems like hardship for a generation or an individual may on the contrary appear to be self-evident to another.

It means that we can definitely achieve the objective of carbon neutrality.

Questions about sufficiency cannot be dissociated from questions about inequality.

Changes in travel volume from 2015 to 2050 by scenario Distance travelled in km/day/person



LEVERS

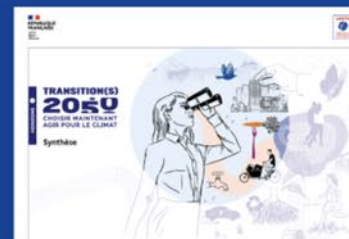
Change the collective imagination, explain, find a social consensus

Download from
transitions2050.ademe.fr

Report
[687 pages]



Summary
[44 pages]



Executive summary
[12 pages]



CONTACT: research@enerdata.net

HELPING YOU SHAPE THE ENERGY TRANSITION

About Enerdata:

Enerdata is an independent research company established in 1991, specializing in the analysis and forecasting of energy and climate issues, at world and country level.

Leveraging our globally recognised databases, intelligence systems and models, we assist our clients in designing their policies, strategies and business plans.



Thank you for your attention!

<https://www.enerdata.net/>