The négaWatt Approach & Scenario

Energy transition through sufficiency, efficiency and renewables

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With support of Fondation Charles Léopold Mayer pour le progrès de l'Homme

Who is négaWatt ?

- Created in 2001 by a team of independent experts and field-practitioners in energy sector
- Goals :
  - Sustainable energy scenarios and strategies
  - Lobbying at national/regional level
  - R&D, educational & training activities

- A core of 25 “negaWatt Companions” + 25 “ambassadors”
- Over 1200 members

- Created in 2009
- Subsidiary and operational branch of the association

Why acting on energy ?

Climate change

Fossile and mineral resources depletion

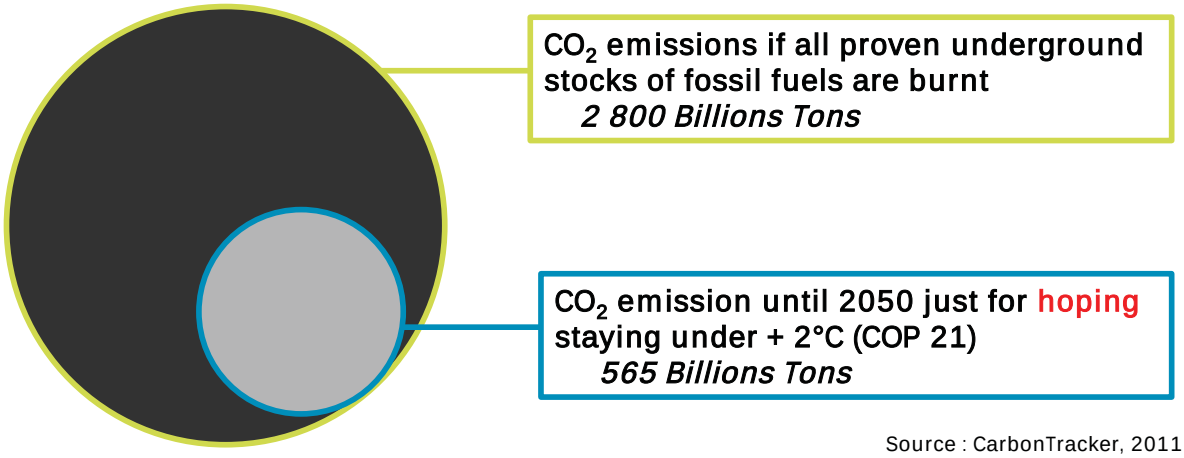
Major industrial accidents

Local pollution

Energy poverty

… all are consequences of our energy drunkenness !

About Climate Change

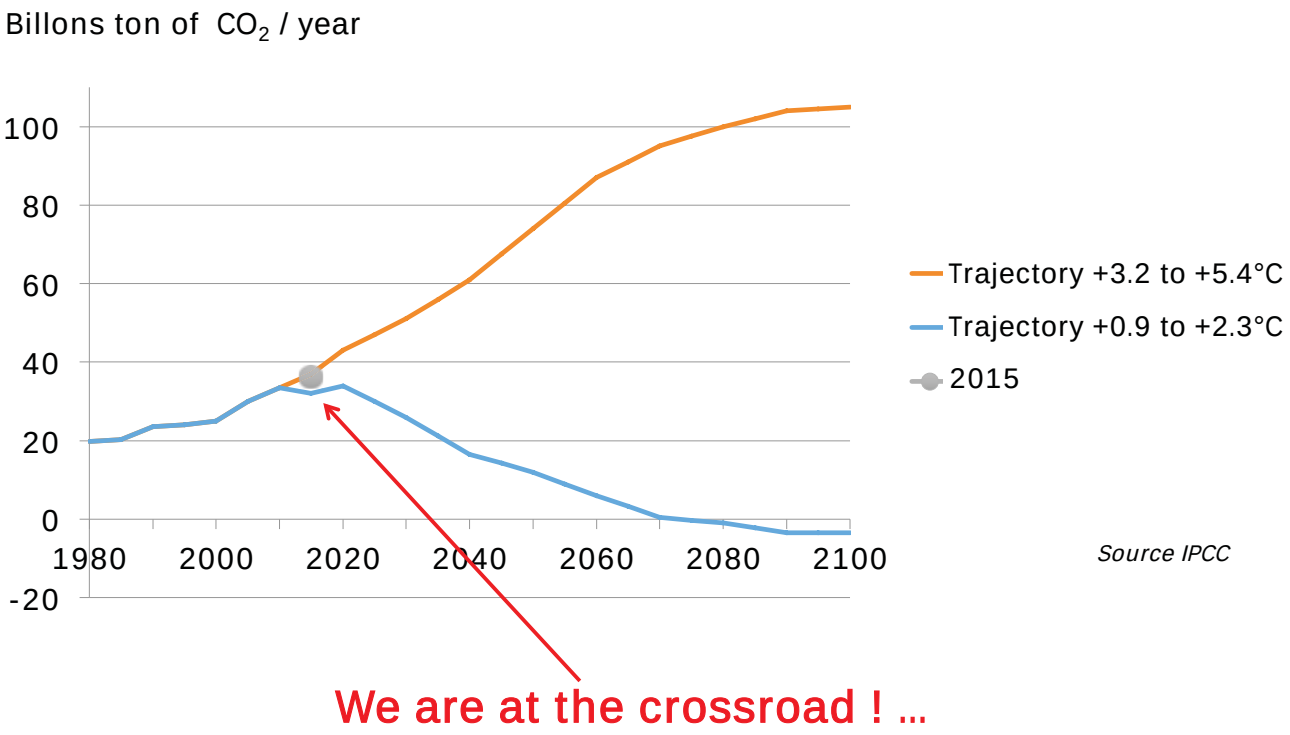


Source : CarbonTracker, 2011

Therefore, matching COP21 goals approved by 195 countries means

leaving up to 80 % of fossil fuels resources underground !

World CO2 emissions

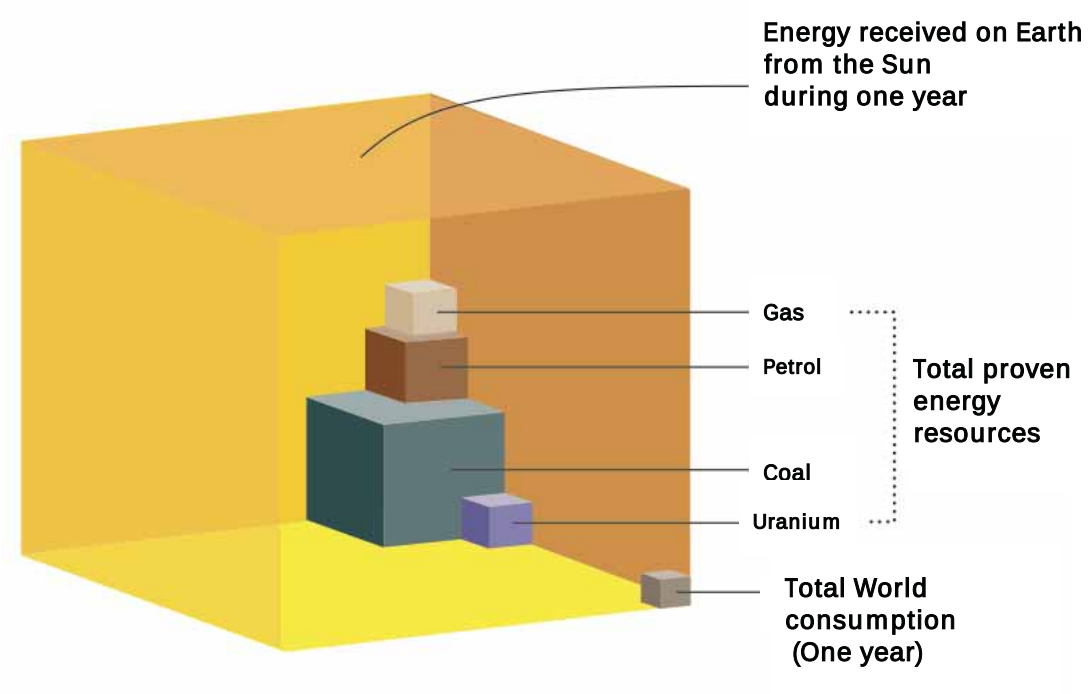


Source IPCC

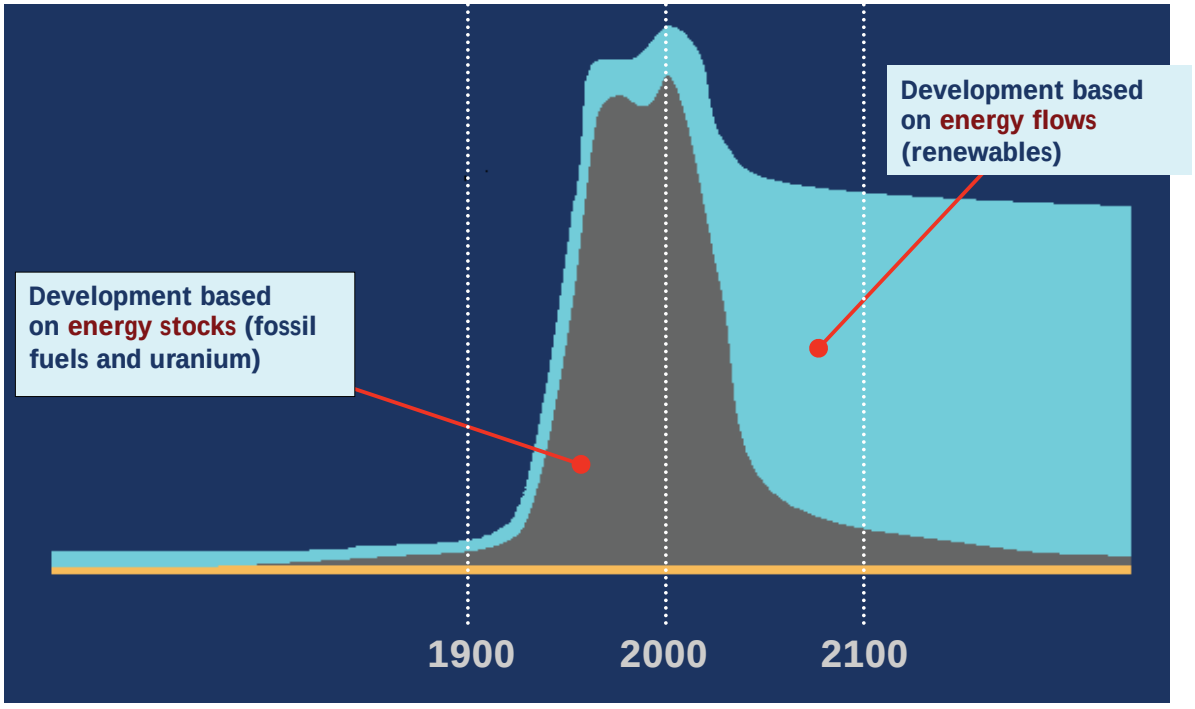
02.

Some reminders about energy

Primary Energy Sources (World)



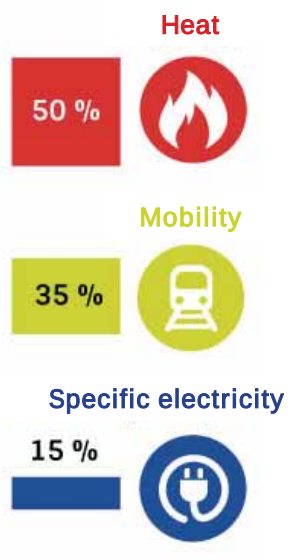
A change of paradigm



Our current energy system (France 2015)

1) What is energy used for?

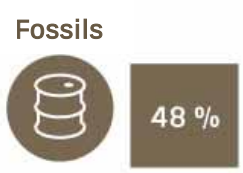
Final uses



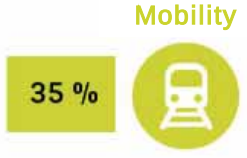
Our current energy system (France 2015)

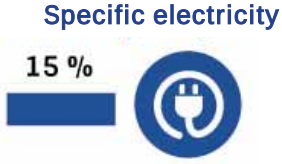
2) Where does energy we use come from ?

Primary sources



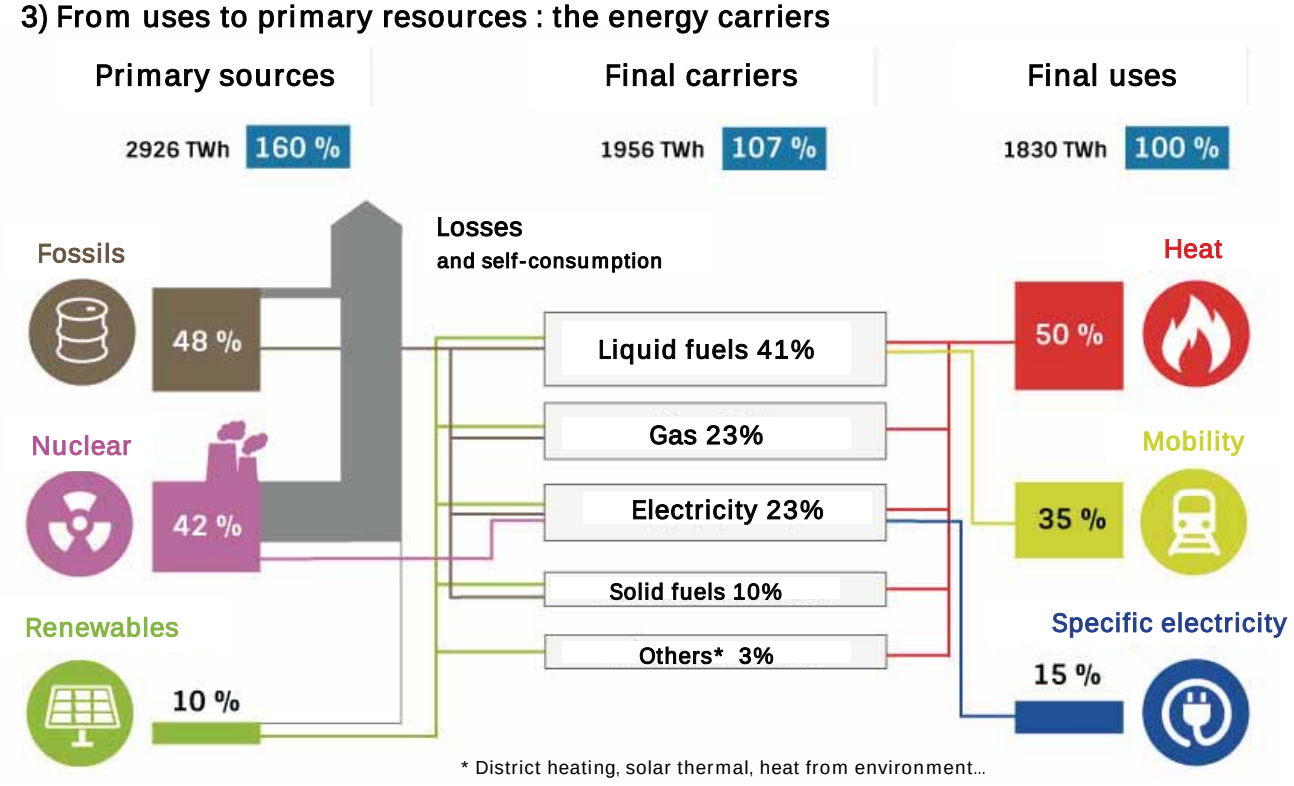
Final uses





Our current energy system (France 2015)

3) From uses to primary resources : the energy carriers

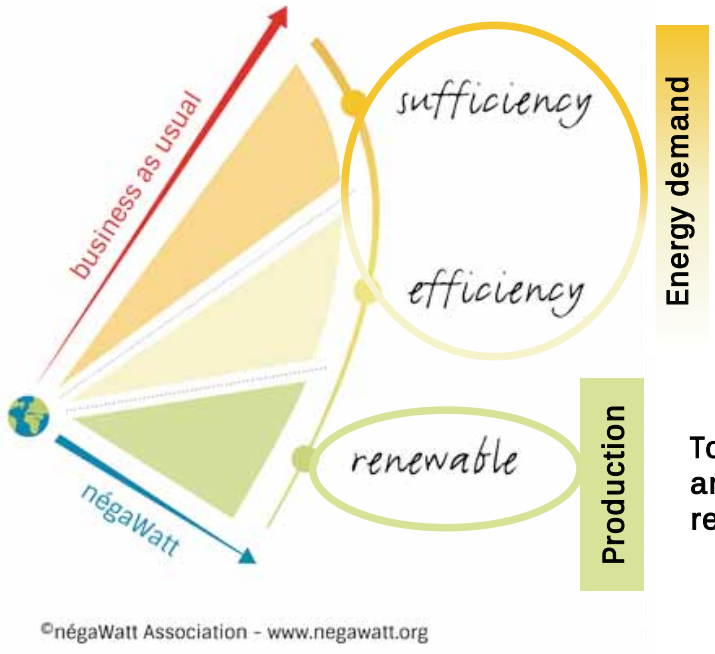


* District heating, solar thermal, heat from environment…

négaWatt approach & scenario

- Comprehensive approach
- Demand and supply
- Energy balance and overall impacts

The négaWatt approach



To start from for services and the way to reduce the need of energy for their satisfaction

To minimize the quantity of energy needed for satisfying a given level of services

To substitute fossil fuels and nuclear power by renewable sources

Sufficiency : one principle, three levels

PRINCIPLE : to reduce the amount of energy needed by prioritizing ***really useful*** and ***well designed*** energy services

1. *Dimensional* sufficiency

- Choosing the right size, dimension and power rate when buying an equipment

2. *Smart use* sufficiency

- Adjusting level and duration of use of a given equipment to real needs

3. *Collaborative* sufficiency

- Sharing the use of a given equipment among several users

Sufficiency *vs* drunkenness ?

Crédit photo : wfeiden

Efficiency : one principle, four levels

PRINCIPLE : to reduce the consumption of energy necessary for satisfying a given level of energy service

1. *Design* Efficiency

- Reducing **embedded energy** « from cradle to grave » (Eco-Design)

2. *Adaptation* Efficiency

- Optimising energy exchanges with the environment (Insulation, re-powering, …)

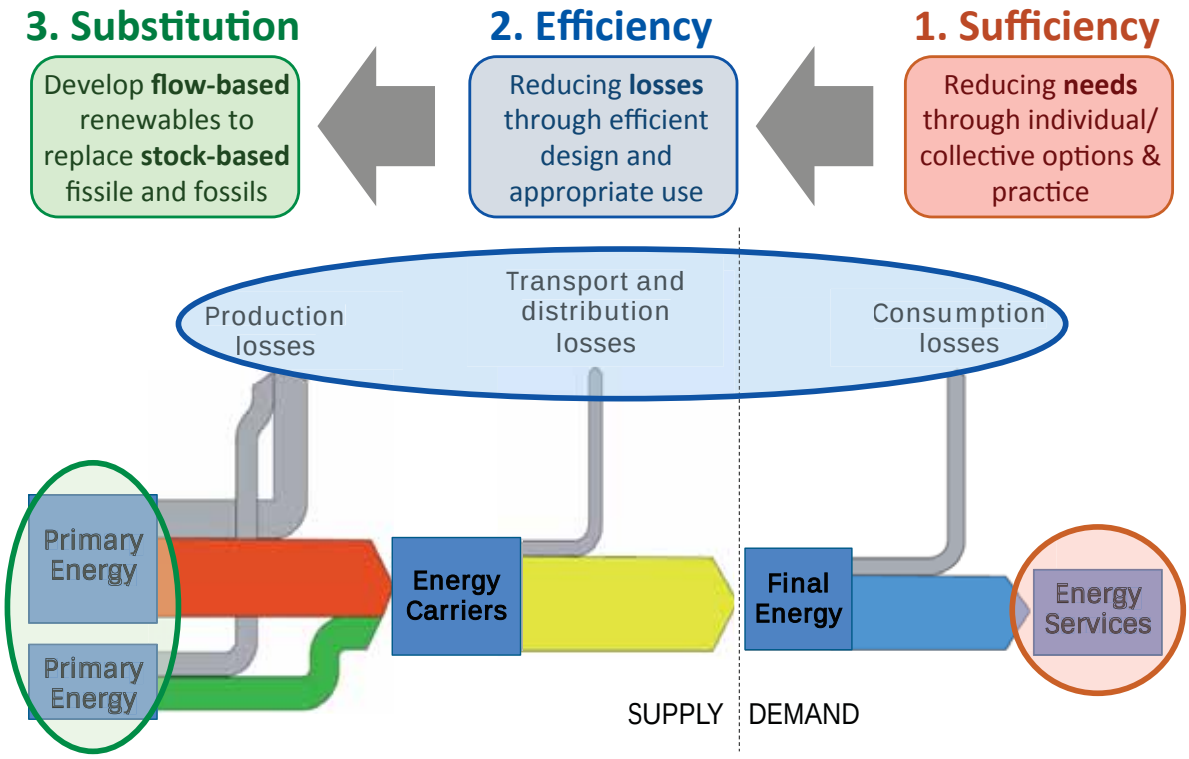
3. *Final use* efficiency

- Improving yields and minimising operating losses

4. *Production* efficiency

- Improving energy transformation chains

Applying the négaWatt approach to energy chain

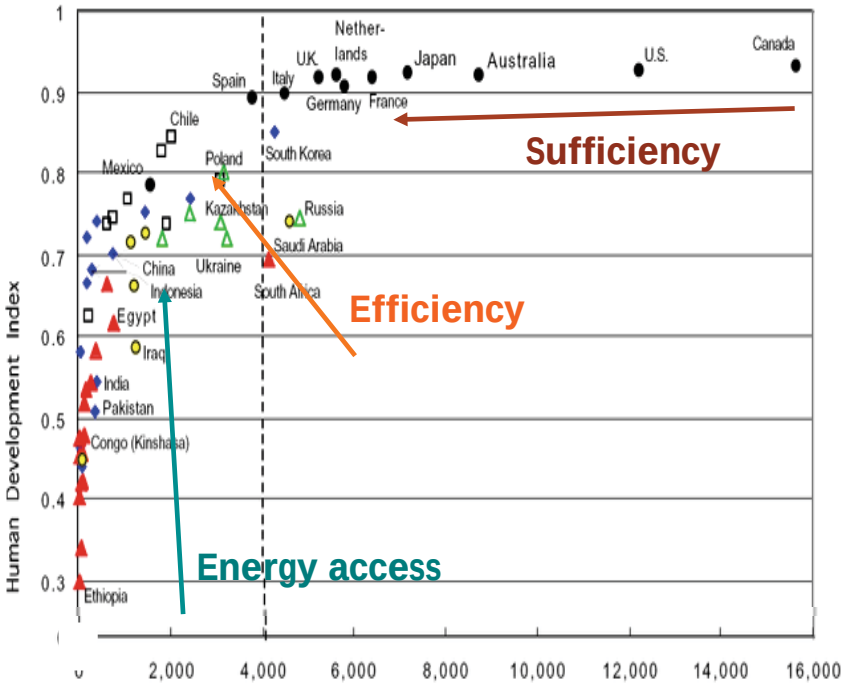


Differentiated approach and responsibilities

Message of négaWatt during COP21 :

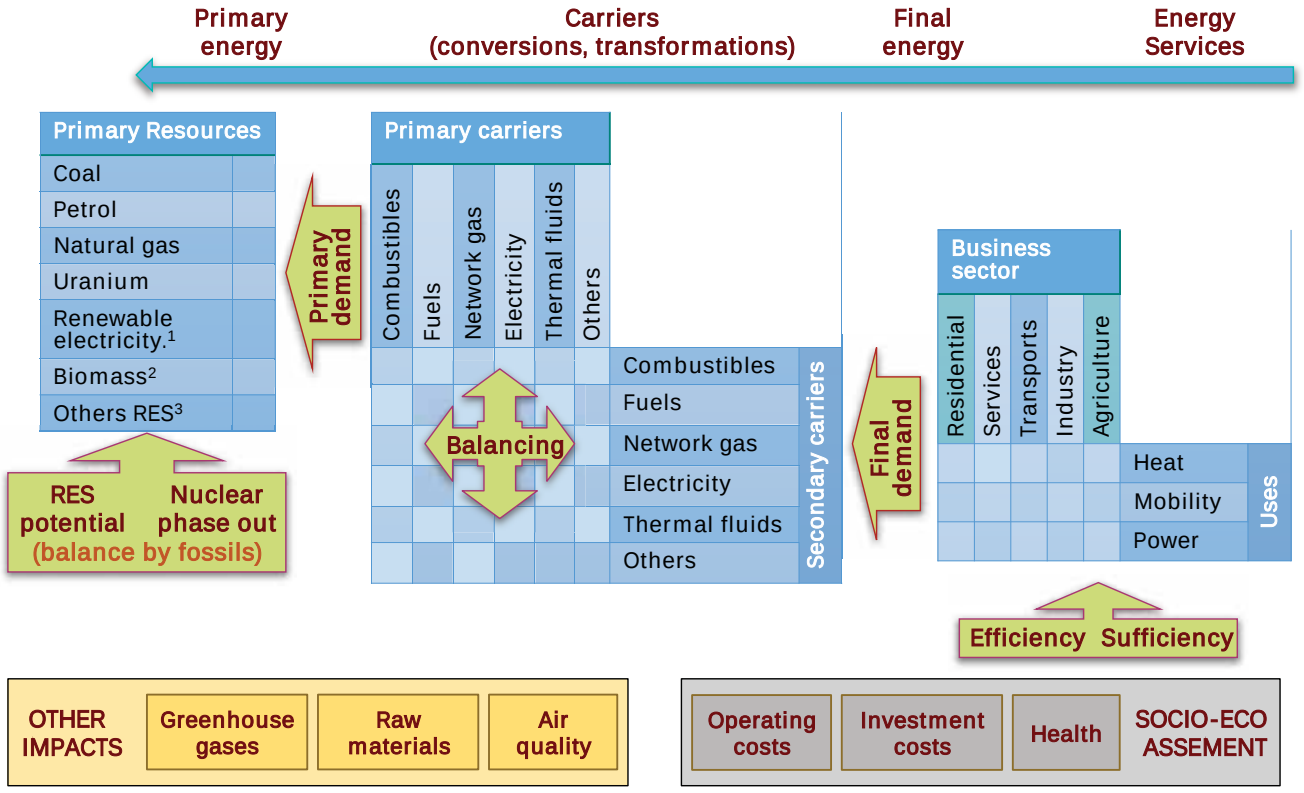
Sufficiency is key to:

1. Reach climate objectives of developed countries
2. Send a message on a change of lifestyles to emerging countries
3. Provide solidarity to least developed ones



Source : AIE

From approach to scenario



Philosophy of the négaWatt scenario

- A scenario for a realistic and sustainable energy transition

1 **Hierarchy of options**

› Actions on energy demand, throudh sufficiency and efficiency, first

› Priority to the use of energies based on flows rather than stocks

2 **Technology and economic credibility**

› Relying on proven solutions, innovation as a « Plus »

› Physically realistic and economically sound

3 **Sustainable development as a whole**

› Reducing all risks and impacts of energy uses (not only carbon)

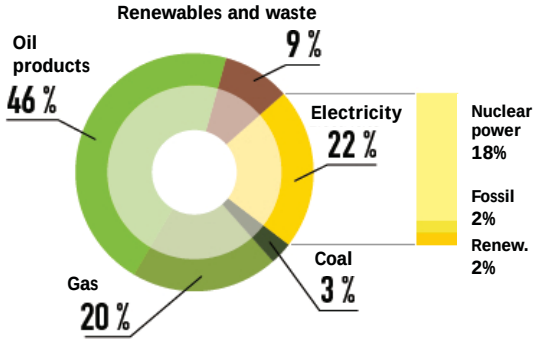
› A comprehensive (holistic) and clear guideline for action

Leaving incomes and benefits to future generations, rather than burdens and debts !

French energy profile

- Dependency on fossil fuels remains high (70%)
- GHG emissions considered 4-fold higher than sustainable: “factor 4” introduced in 2005 law (objective: 75% cut by 2050)
- Strong dependency on nuclear power for electricity (>75%)
- Low/slow development of renewable energies
- Timidity of energy demand policies

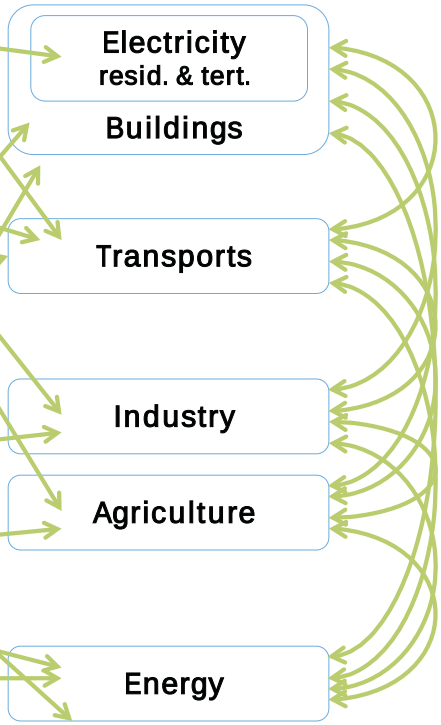
France’s final energy consumption, share by energy source (2011)



Source: bilan de l’énergie, 2011, SOeS

Contents of the négaWatt scenario

- Sustainable consumption
  - Proper uses of efficient appliances
  - Sustainable goods and service
- Space management
  - Urban planning
  - Modal transfer in mobility
- Building stock management
  - Stabilisation of surfaces used
  - Low energy retrofitting of existing
- Sustainable production
  - Efficient industry processes
  - Sustainable agriculture & forestry
- Switch of sources
  - The best carrier for each use
- Development of renewables



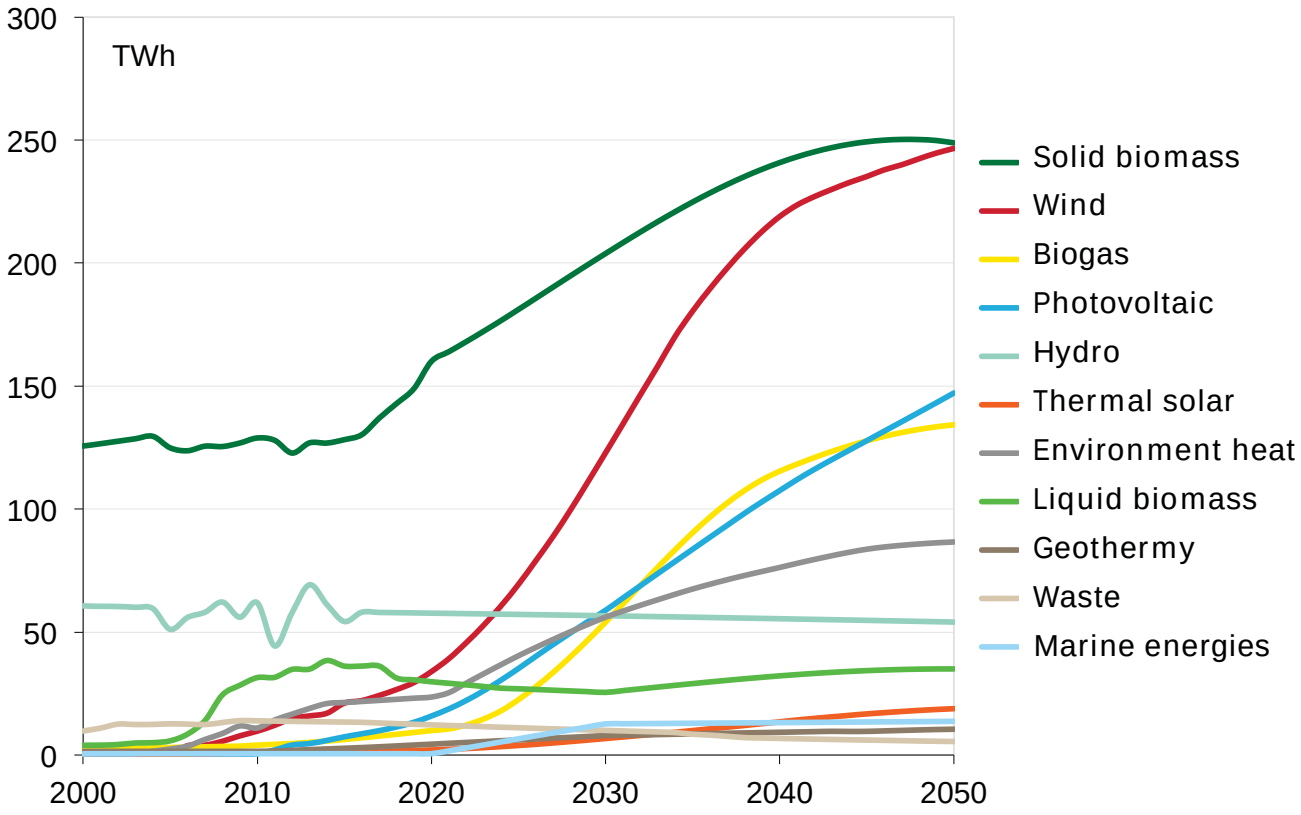
Implementation of sufficiency and efficiency

Buildings	Moderation of surfaces/person or activity Zero energy for new buildings Low energy retrofitting of all existing buildings
Specific electricity	For all uses : systematic spread of today best equipment and behaviours
Transports	Urban planning to reduce distances Modal transfer (road-rail, individual-collective) Efficient vehicles well-fitted to each use
Industry	Extended reusing/recycling of goods/materials Switch to sustainable (bio-sourced) products Efficient manufacturing processes
Agriculture & food	Agro-ecological methods Production of bio-sourced materials Less meat-based diets (from 2/3 to 1/3 of proteins) *(coupling négaWatt and Afterres scenarios)*

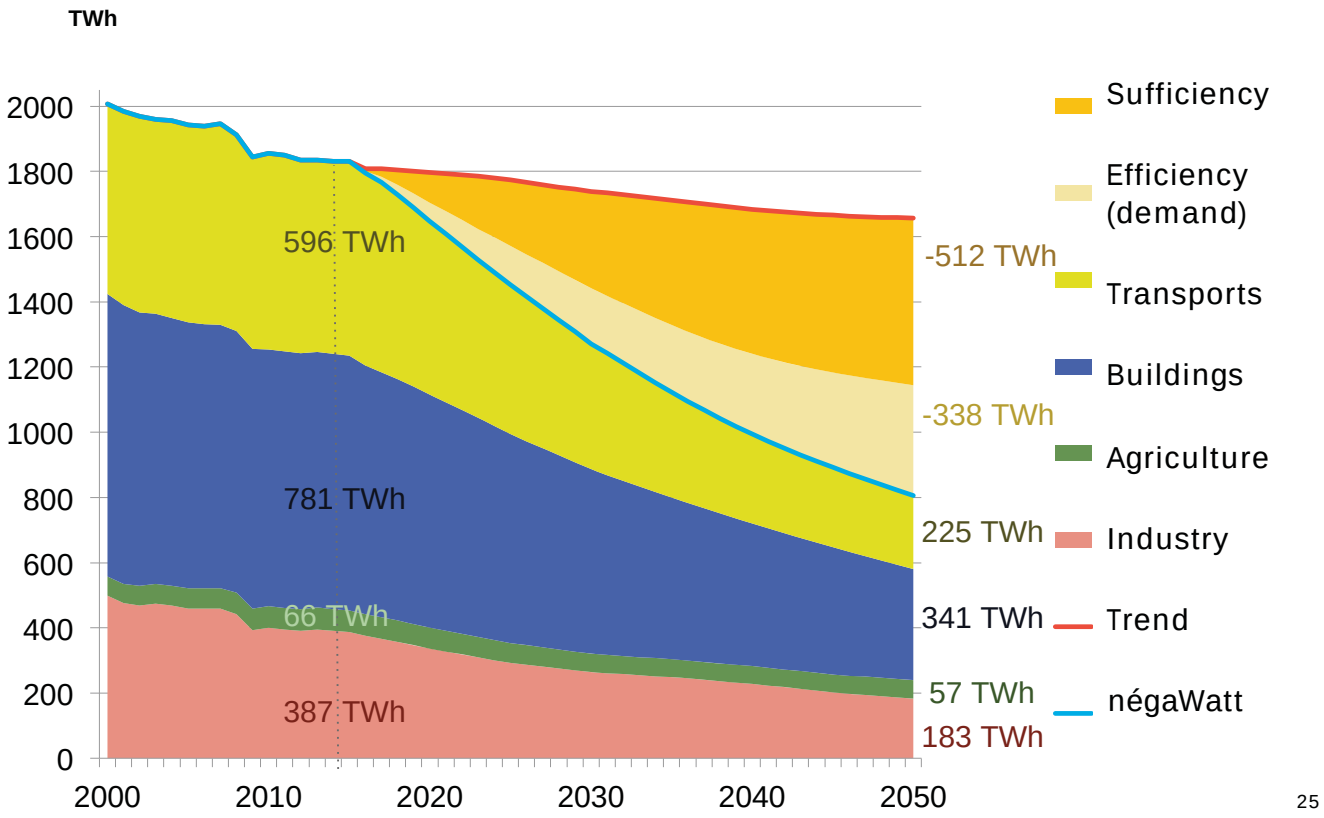
More than 50% cut in final energy consumption in each sector by 2050

Allows for sustainable use of bioenergy

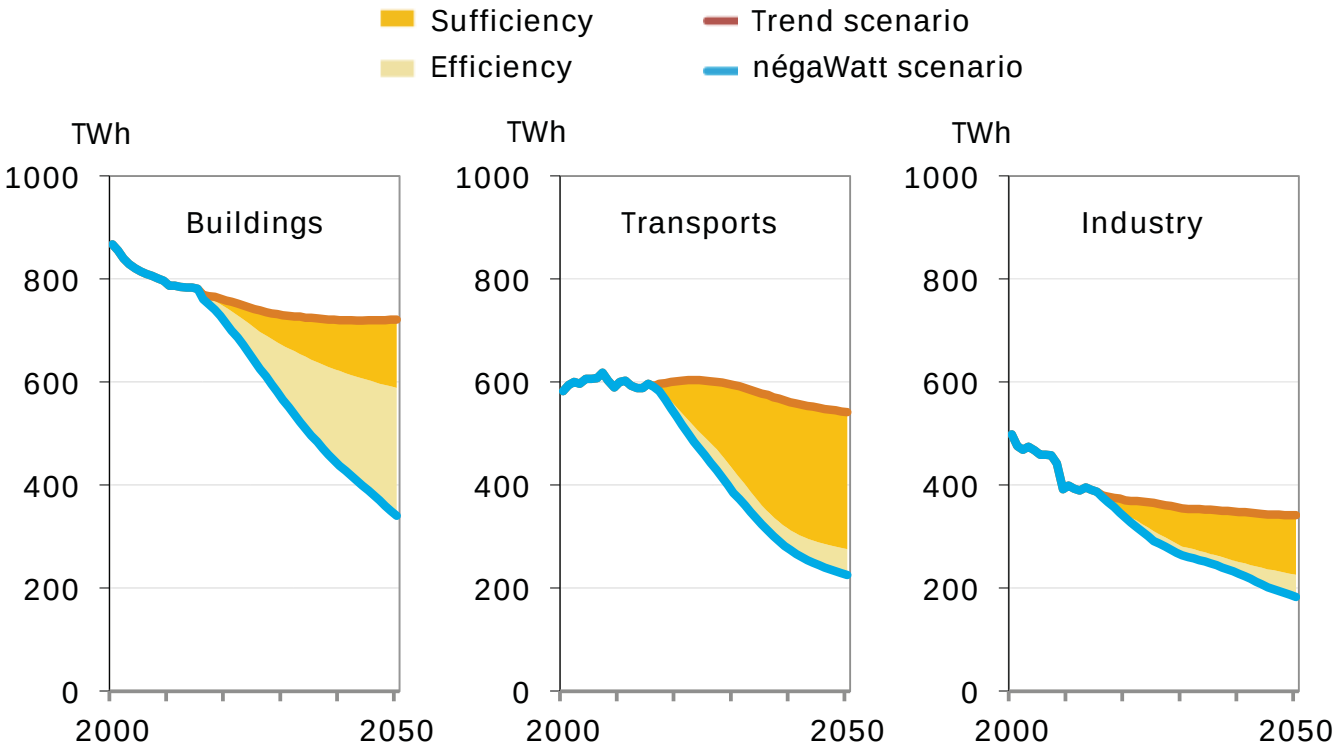
Renewable energy sources development



Results : final energy by sector of activity

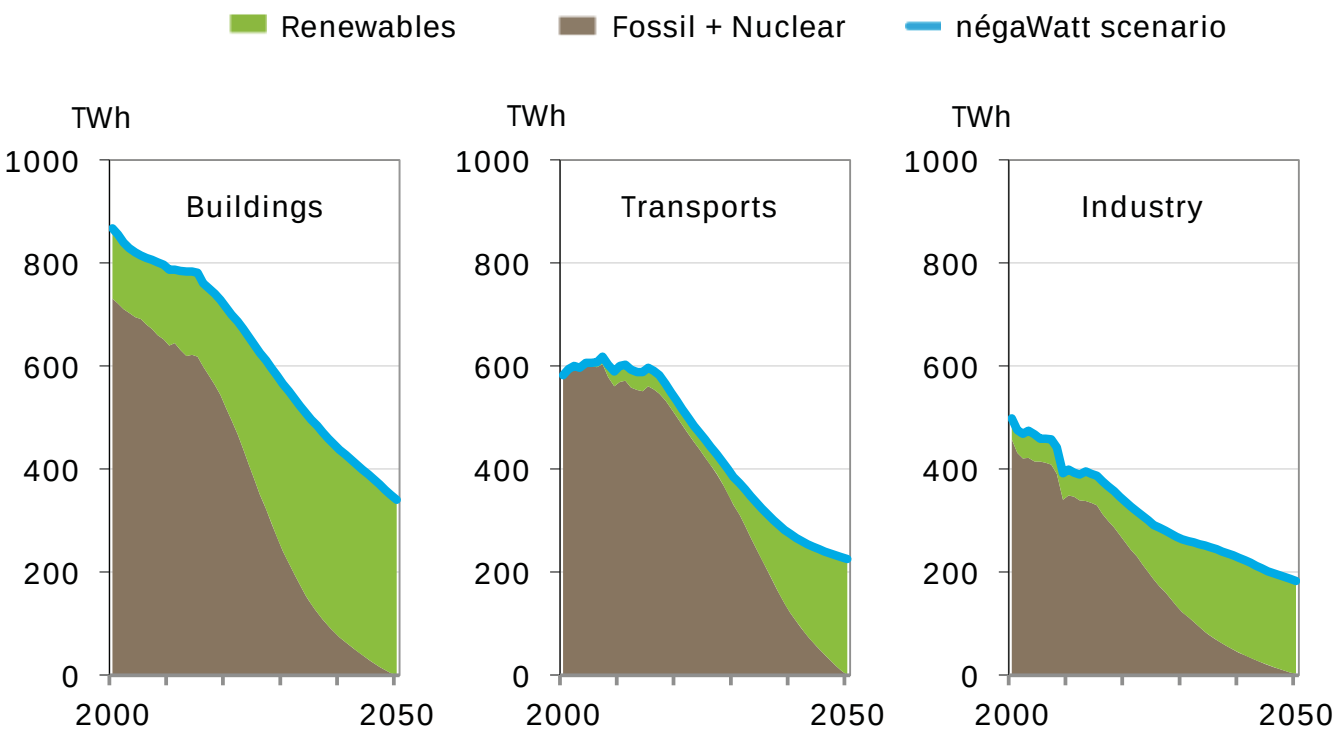


Results – Final energy in main sectors



Evolution of final energy consumption in the négaWatt scenario

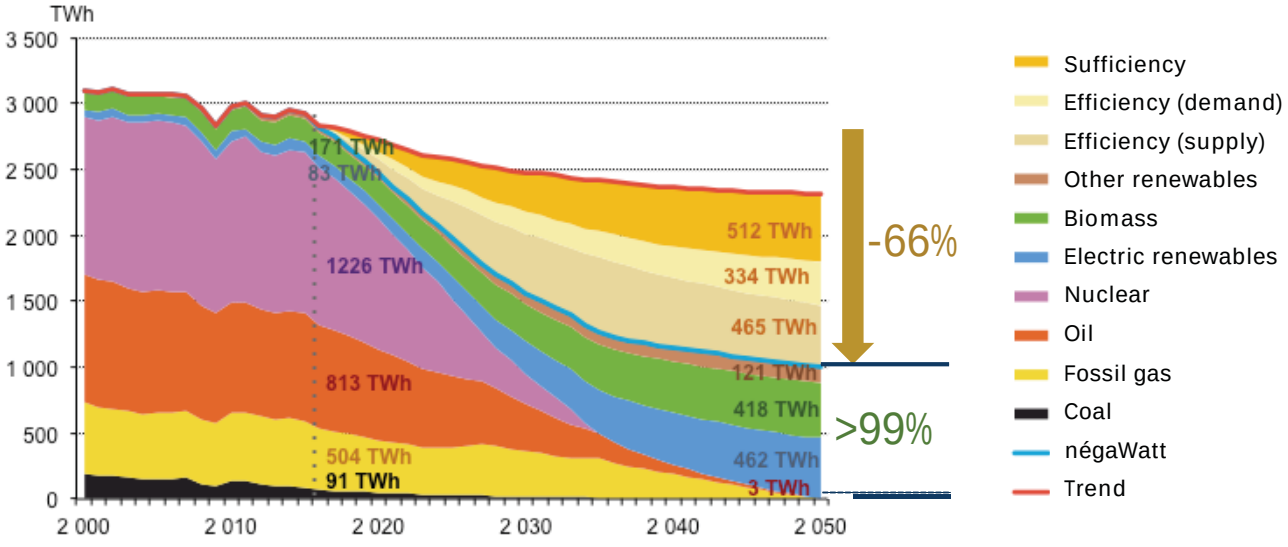
Results – Final energy



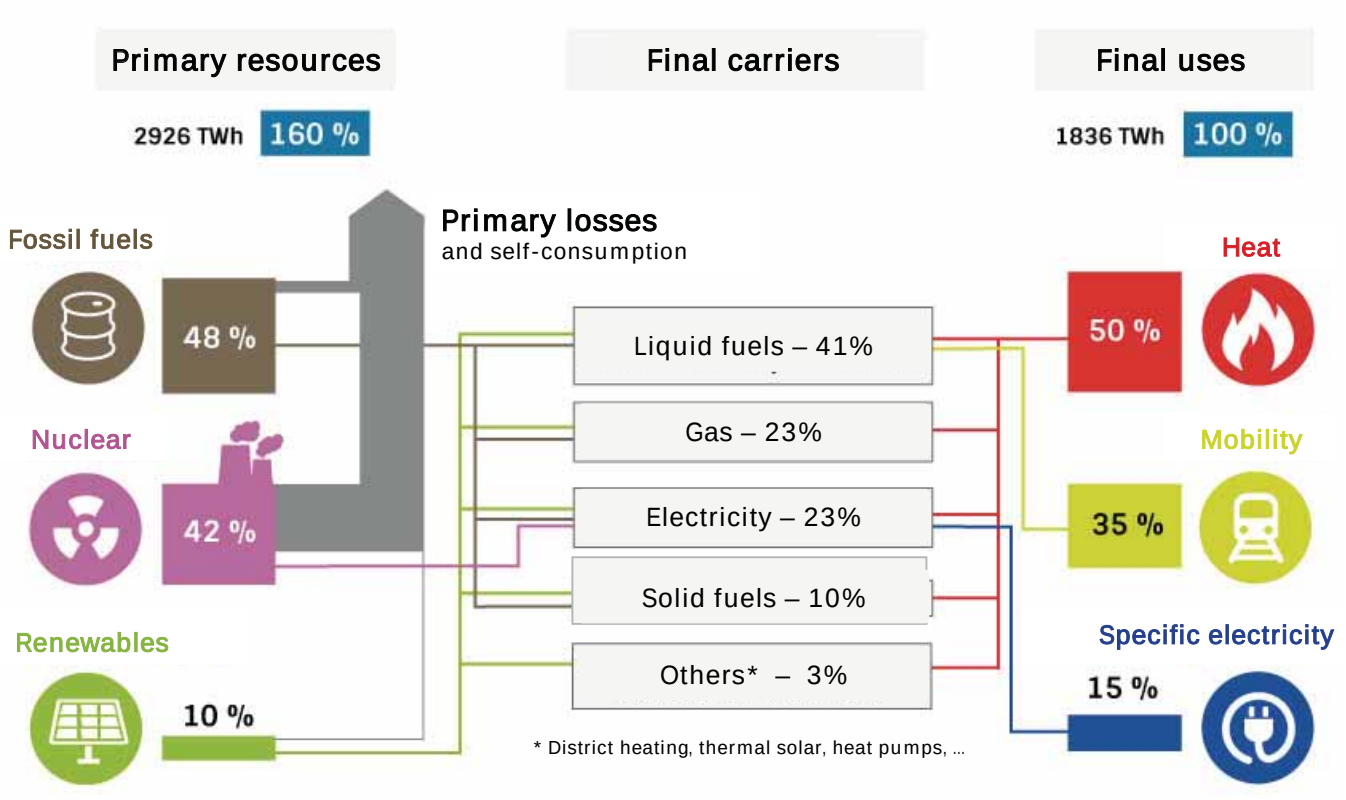
Evolution of final energy consumption in the négaWatt scenario

Results: primary energy by source

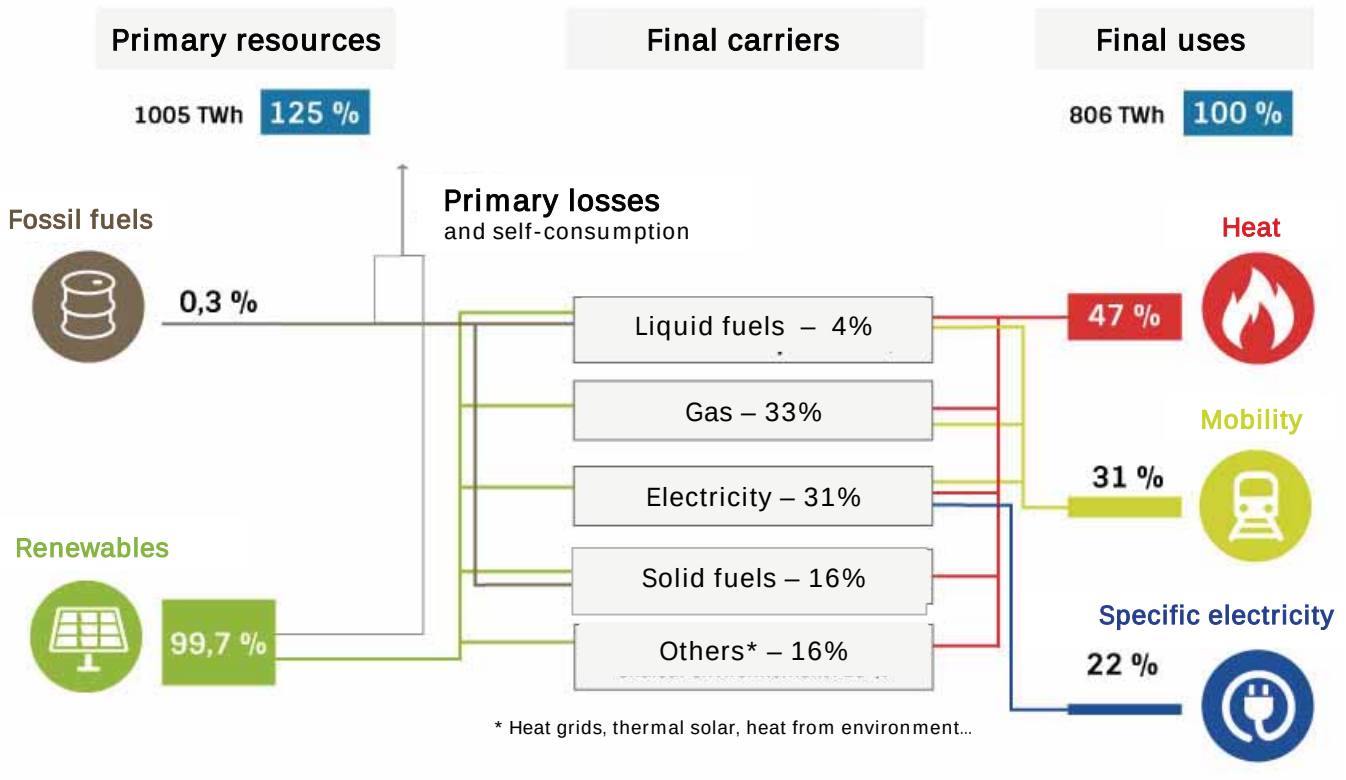
- Reducing consumption is key for allowing renewables to come **in substitution**, **not in addition**



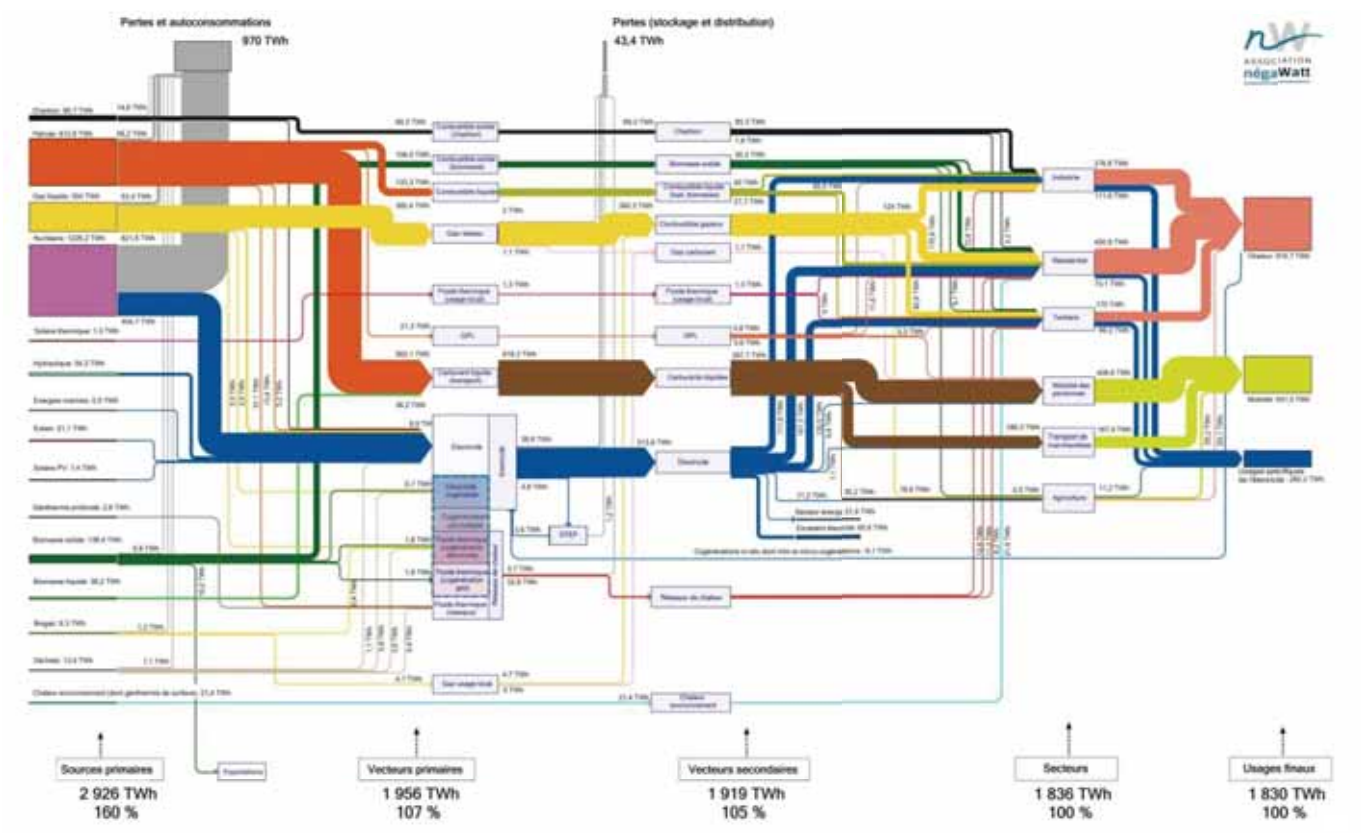
Transformation of the system - Year 2015 (start)



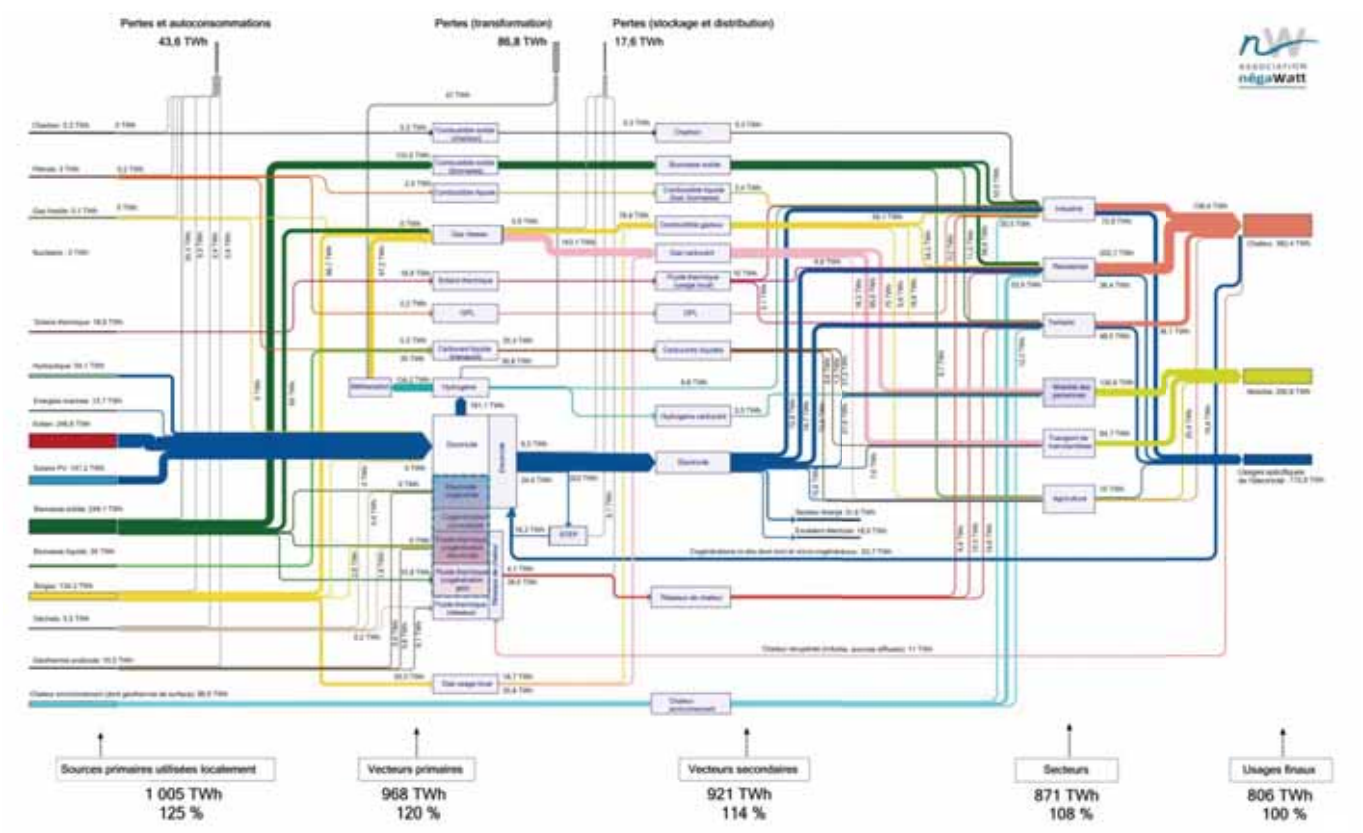
Transformation of the system - Year 2050 (nW)



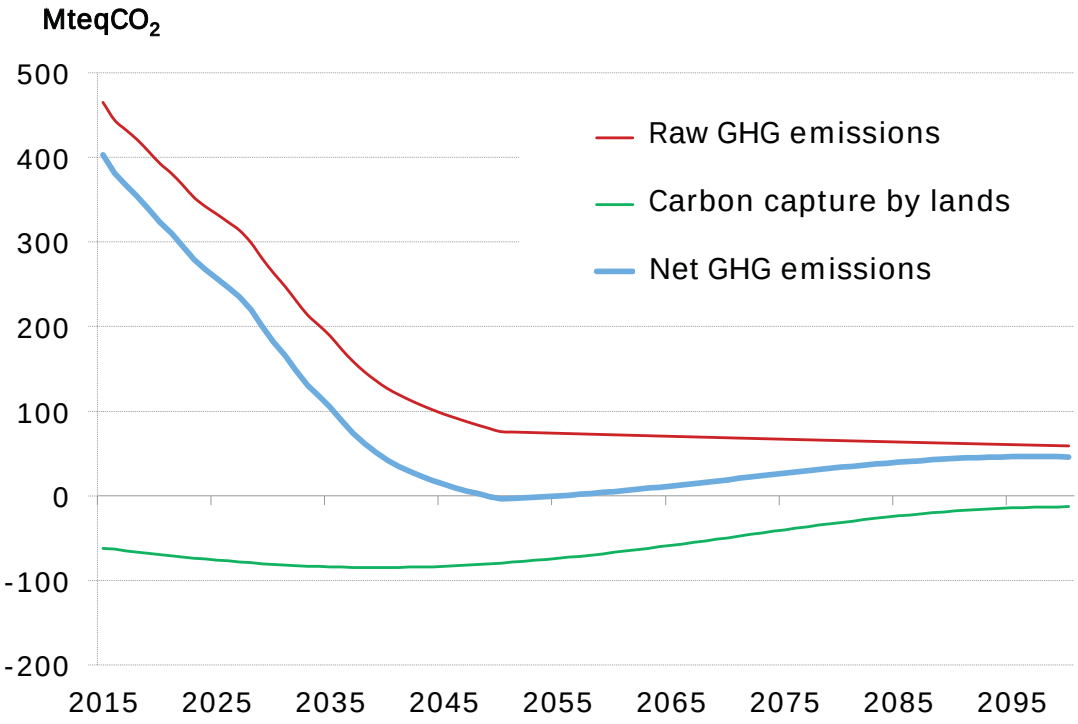
Transformation of the system - Year 2015 (start)



Transformation of the system - Year 2050 (nW)

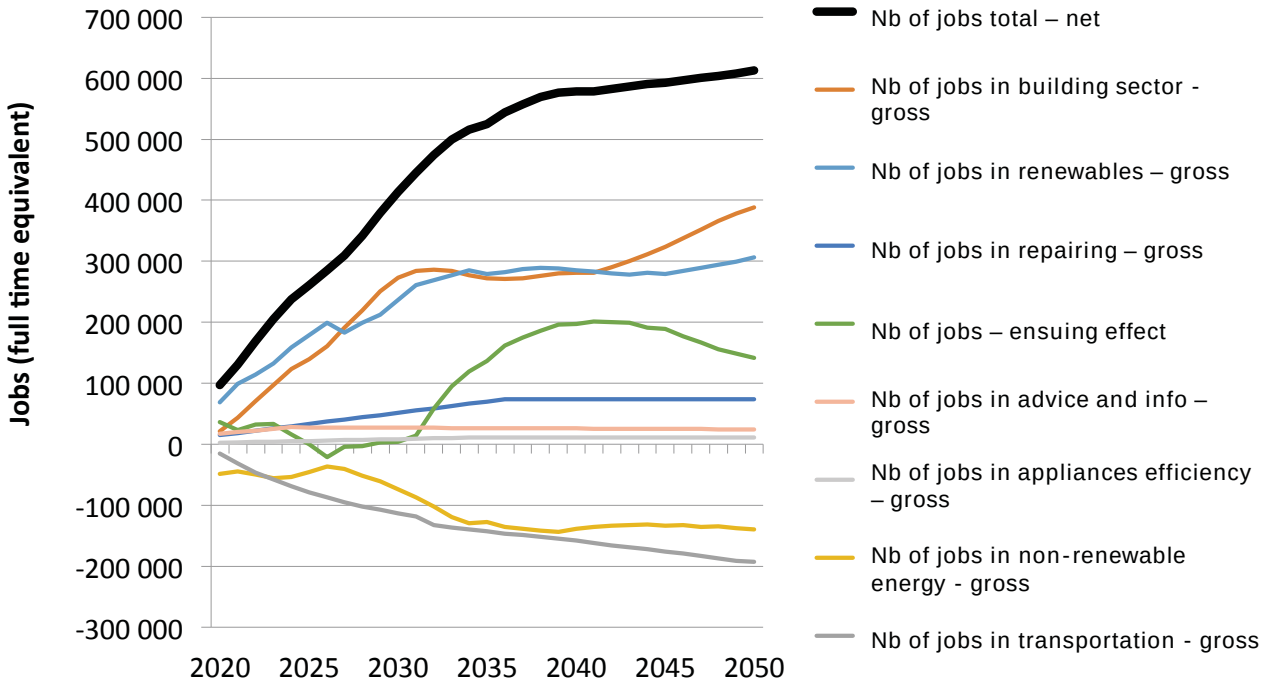


Carbon neutrality by 2050



Evolution of raw and net GHG emissions by 2100

A clearly positive impact on jobs



+ 100 000 jobs in 2020, 400 000 in 2030, 600 000 in 2050 compared to the trend scenario

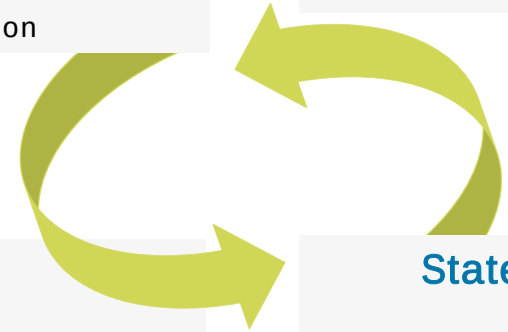
Synergy between all players as an unavoidable item

Citizens

- Housing: sufficiency, thermal efficiency, integrated renewables…
- Goods, services, mobility : responsible consumption

Local communities

- Local policies
- Information and education
- Public orders



Business

- Sustainable conception of goods
- Circular economy
- Innovation, research

State / Europe

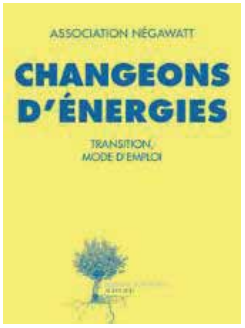
- Regulations
- Incitative tax system
- Support to R&D

Going further

www.negawatt.org

- Scenario synthesis (available in English)
- Dynamic graphs
- Videos
- Press review
- News

- Two books



www.decrypterlenergie.org

Décrypter l'énergie

- To find answers to popular misconception about energy transition

Thank you for your attention!

To make possible what is desirable…

www.negawatt.org

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