CACTUS

STRENGTHENING CENTRAL AND EASTERN EUROPEAN CLIMATE TARGETS THROUGH ENERGY SUFFICIENCY

CACTUS project
EUKI

Kick-off workshop
October, 9th 2020

Supported by:

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

European Climate Initiative EUKI

based on a decision of the German Bundestag

WELCOME!

Agenda

08:30 **Welcome**

- 08:30 - Quick round of introduction
- 08:40 - Presentation of the CACTUS project

08:50 **Introduction to energy sufficiency**

- 08:50 – Sufficiency concept and context
- 09:20 – Sufficiency and modelling: the nW approach
- 09:50 – Sufficiency and modelling: the Nordic Baltic Energy Programme

10:10 **Sufficiency in Central and Eastern Europe**

- 10:10 – Hungary: Relevance of sufficiency in the transport and building sectors
- 10:40 – Lithuania: Relevance of sufficiency in the transport and building sectors

11:10 **Tea and Coffee break**

11:20 **Bridging the sufficiency gap: an introductory technical dialogue**

- 11:20 – Discussion

12:15 **Conclusions and next steps**

Quick round of introduction

Some practical points

1. Recording and picture on social media: OK?

2. Questions and answers:

During presentations, we shall:

- take specific questions for Edouard Toulouse and Gunnar Boye Olesen

- only take clarification questions for the other presentations.

Please write all comments and questions and in the chat, so that we integrate them in a moderating board for the workshop session at 11:00

Presentation of the CACTUS project

Stephane Bourgeois

Very low precipitations are sufficient for CACTUSES to thrive in the driest deserts of America....

But that is the only link between the project name and its topic: energy sufficiency.

EU Political context

- EU 2030 climate and energy framework, including EE target (32.5% efficiency with upwards revision and absolute numbers for final and primary consumption)

- European Council conclusions 12.12.19:

  "In the light of the latest available science and of the need to step up global climate action, the European Council endorses the objective of achieving a climate-neutral EU by 2050, in line with the objectives of the Paris Agreement. One Member State, at this stage, cannot commit to implement this objective as far as it is concerned, and the European Council will come back to this in June 2020.“

- EU Green deal and climate law (55%) in course of negotiation

- Consequences on national climate mitigation and energy strategies and plans, search for more ambition

Specific Central and Eastern European context

- High energy dependency
- High energy poverty and low energy services
- Economy and life-style catching-up fast

- Role of sufficiency with regards to energy poverty
- Mitigation of behavioural trends increasing energy consumption?

Consortium

Fraunhofer ISI

ASSOCIATION négaWatt

REKK FOUNDATION

CACTUS Project concept

- Energy sufficiency as a key mitigation lever

- Sensitise on sufficiency and its integration in climate and energy strategies and models

  - **Technical dialogue, knowledge sharing** and capacity building with key national scenario builders:

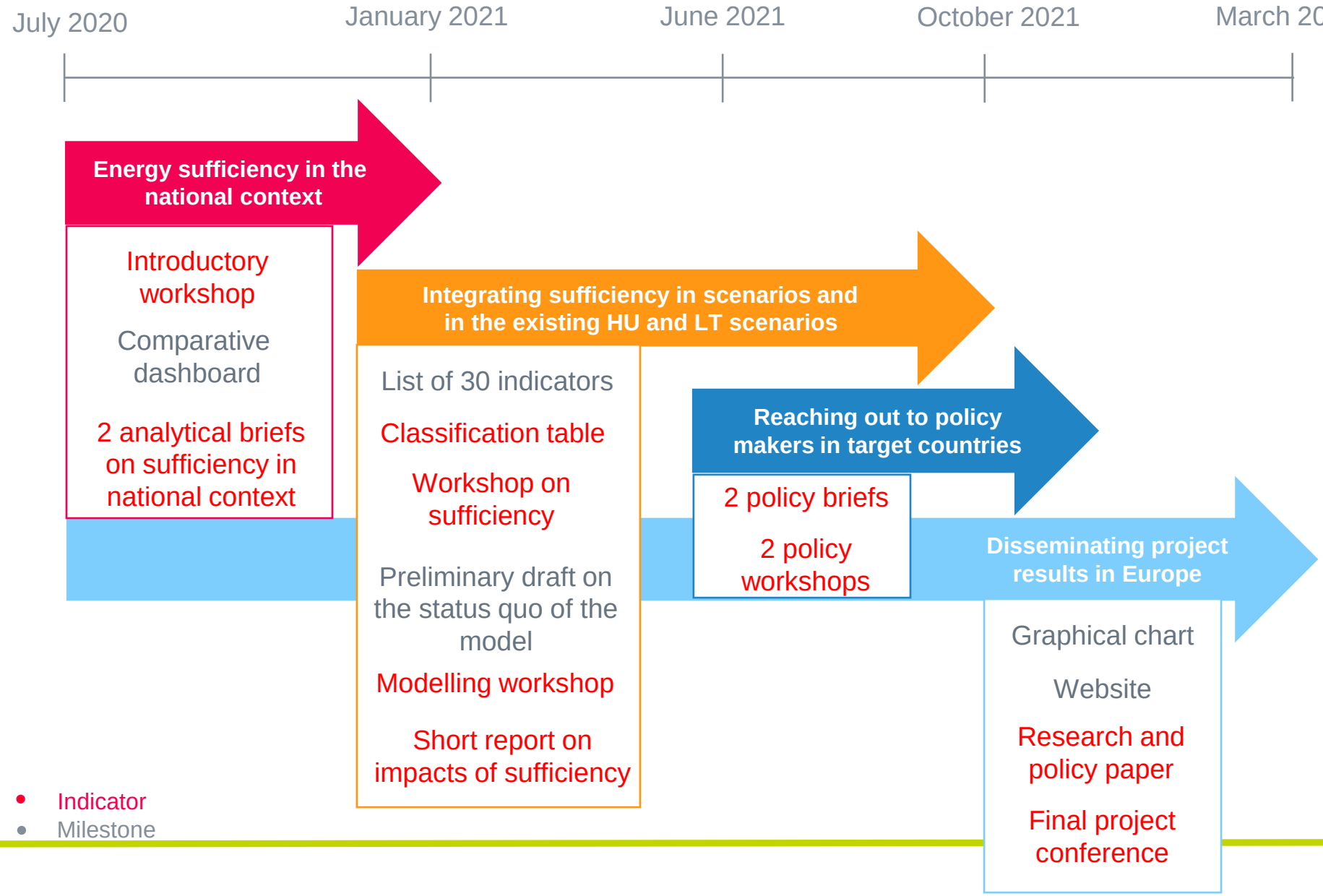
    - Analysing the status quo and ES in the CEE context
    - Building indicators and hypotheses
    - Integrating those in scenario models, and exploring the integration in existing scenario models

    2 sectors : transport and buildings including appliances (incl. fret and tertiary?)

  - Sensitising key policy makers

  - Knowledge sharing with wider EU stakeholders

Project planning

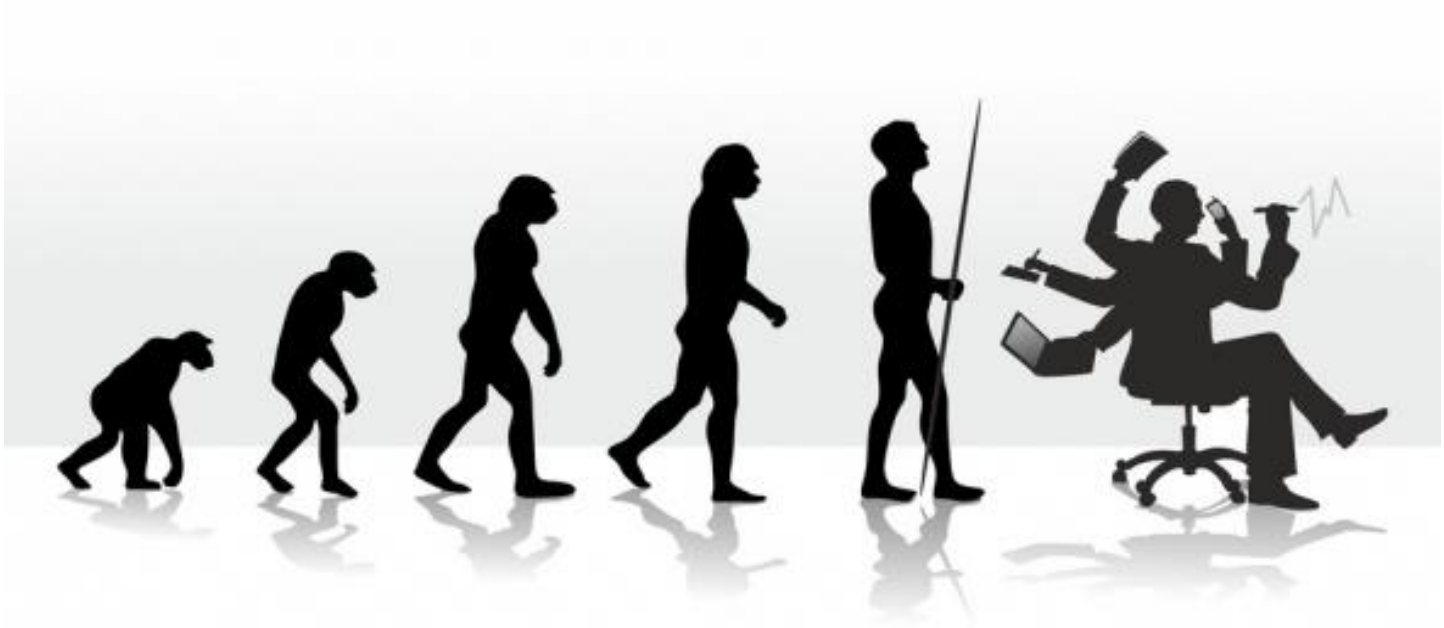


Introduction to energy sufficiency

Sufficiency concept and context

Edouard Toulouse

Energy sufficiency
An introduction



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International Network for
Sufficiency Research & Policy

enough International Network for Sufficiency Research & Policy

- Created in 2017
- ~ 200 members
- ~ 200 references collected
- Leading group:

Edouard Toulouse
négaWatt

Marlyne Sahakian
Geneva U.

Anja Bierwirth
Wuppertal I.

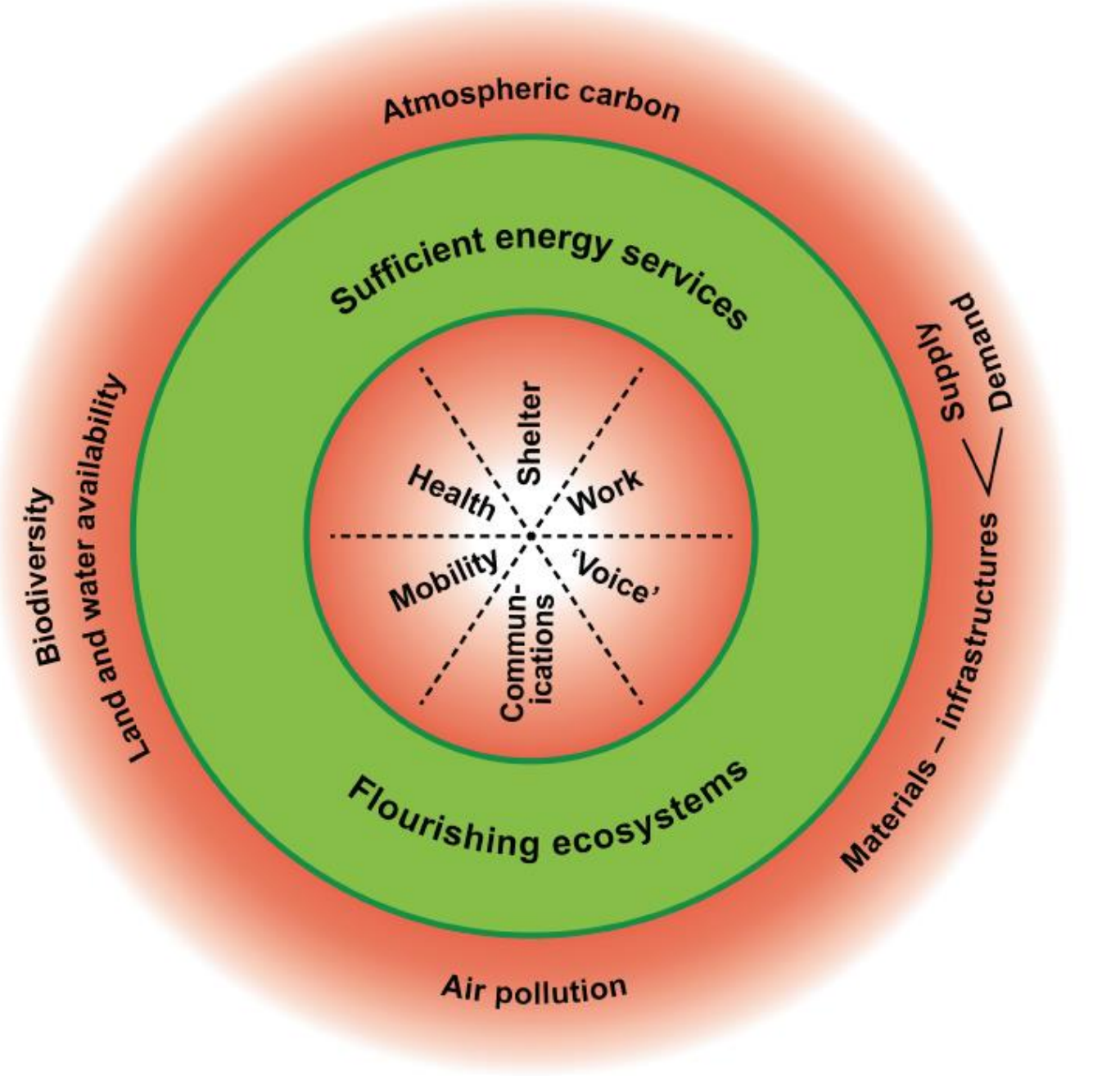
Leon Leuser
Flensburg U.

Sylvia Lorek
SERI

Lorenzo Pagliano
P. Milano

Katharina Bohnenberger
Duisburg-Essen U.

Frances Fahy
Galway U.


Atmospheric carbon
Sufficient energy services
Supply
Demand
Biodiversity
Land and water availability
Shelter
Health
Work
Mobility
'Voice'
Commun-
ications
Materials – infrastructures
Flourishing ecosystems
Air pollution

*"Without **societal transformation**, pathways to limiting warming to 1.5°C and achieving sustainable development will be exceedingly difficult, if not impossible (…)"*

*"The profound transformations that would be needed call for **examining the values, ethics, attitudes and behaviours that underpin societies**."*

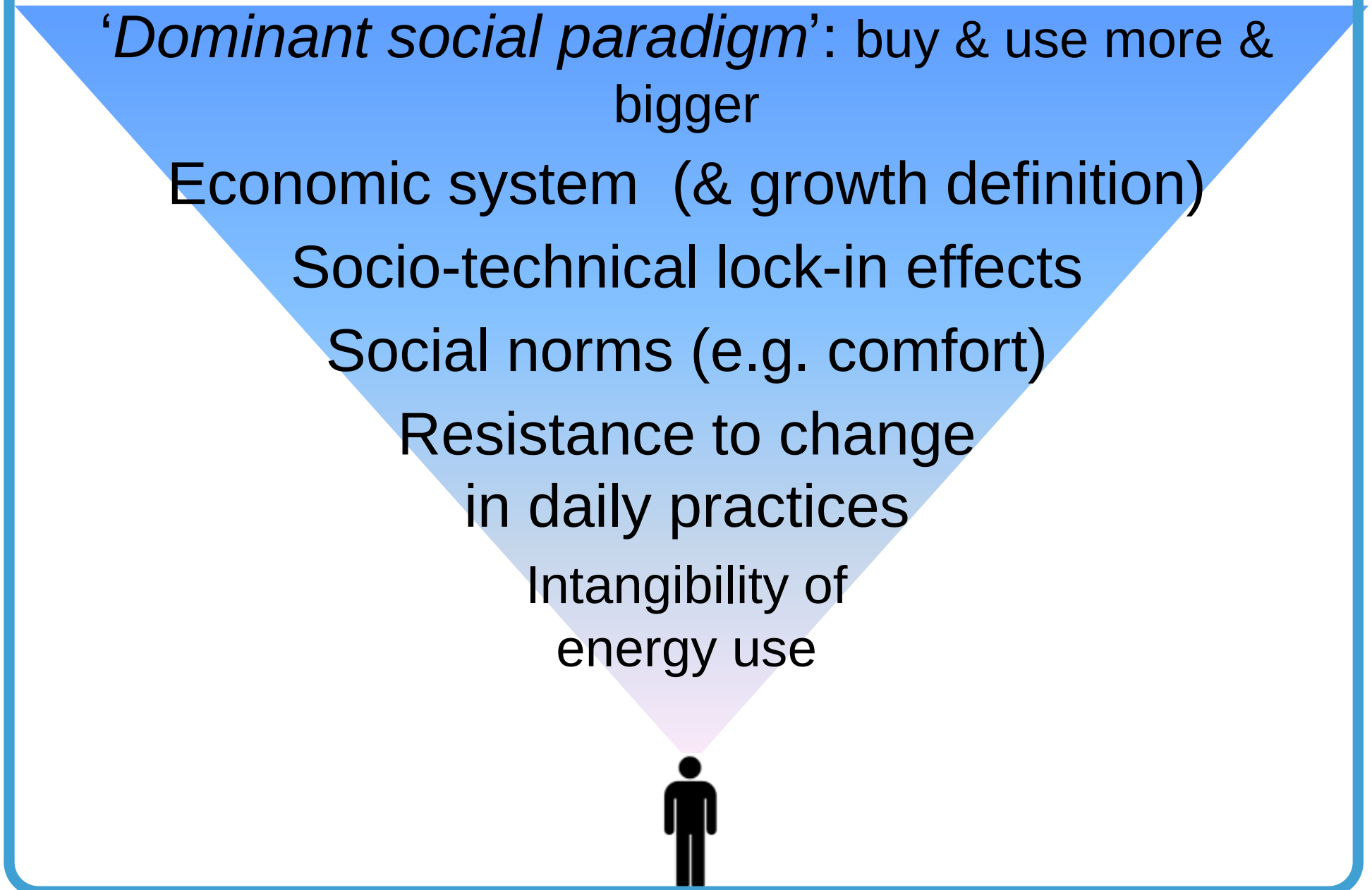
IPCC report on 1.5°C


TAXI

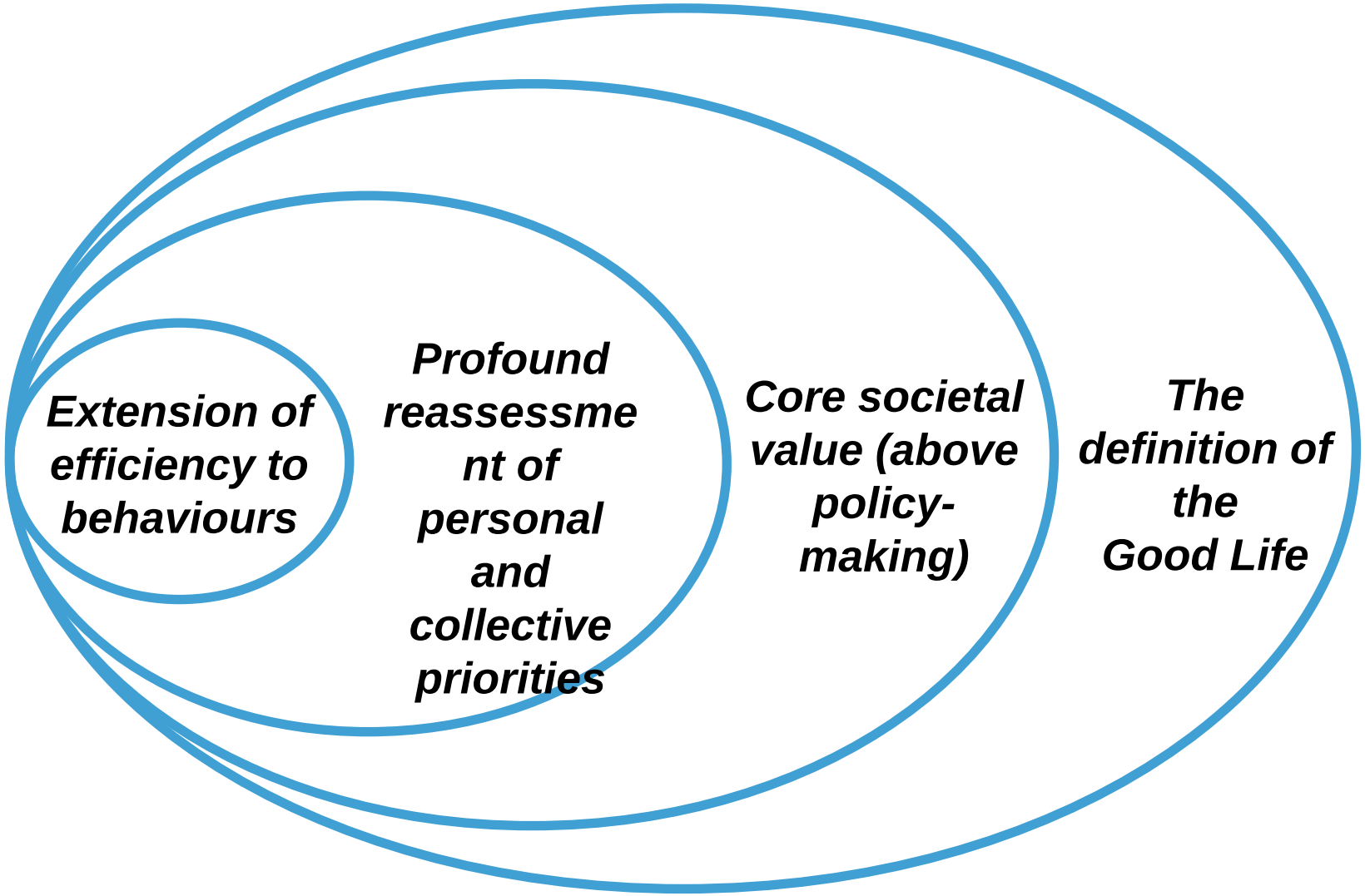
SUFFICIENCY

*… favouring **intrinsically low energy consuming** activities, through changing the **amount and nature** of energy services offered and used.*

Barriers to sufficiency

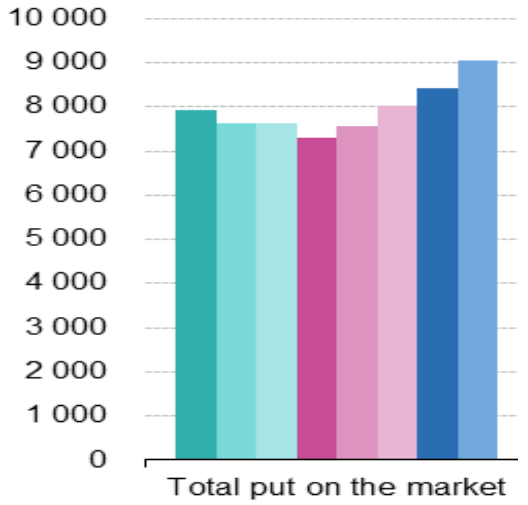


How profound can sufficiency be?

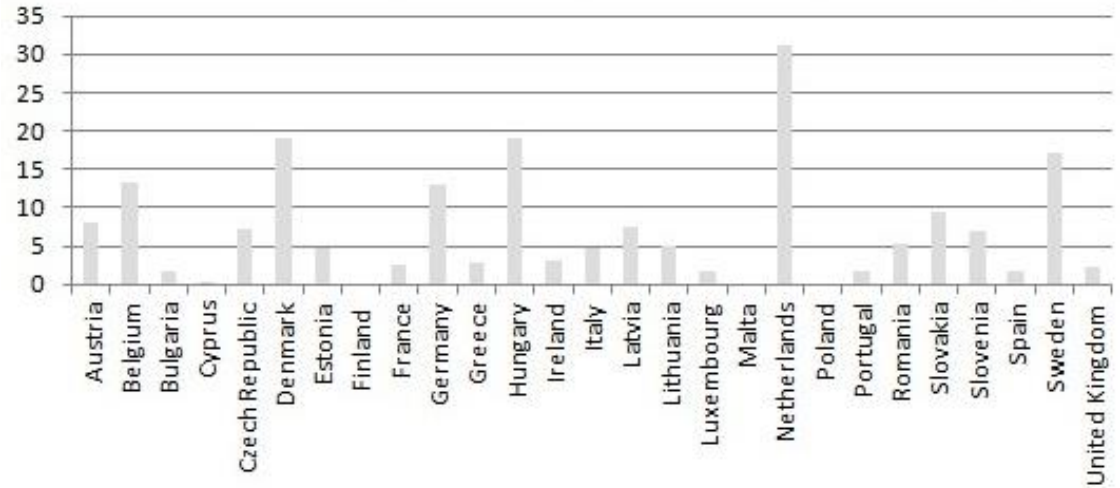


Is sufficiency utopian?

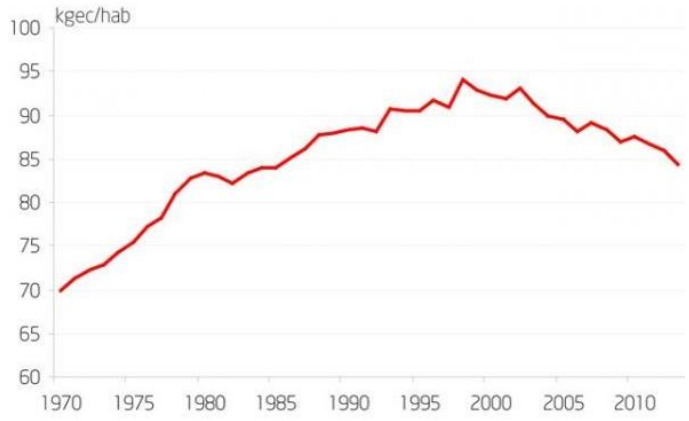
SUV market



Electronics



Cycle use in Europe



Meat consumption in France

Challenges of modelling sufficiency

- Little consideration in mainstream scenarios
- Strong preconceptions on the acceptance and legitimacy of sufficiency options
- Insufficient transparency/backing of assumptions
- Excessive normativity
- Sectoral bias (e.g. sufficiency in businesses?)

Improving sufficiency assumptions

Energy sufficiency: how to win the argument on potentials?

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Keywords
energy sufficiency, scenarios, acceptance, energy savings potential

Abstract
In terms of energy demand, technical efficiency improvements alone may not be enough to tackle climate change and meet the 1.5 °C target if we continue using a growing amount of energy-based services. Actions on behavioural and societal organisation changes – encompassed in the 'sufficiency' concept – are also required.

Energy sufficiency means efforts to rethink and redesign collective and individual practices in order to favour intrinsically low-energy activities and services, to keep us in line with the ecological limits of the planet. It requires reflecting on human needs, social equity, economic development, urban structures, social norms, consumption habits, as well as the role of policies to foster sufficiency.

There is an increasing number of contributions discussing how to take sufficiency into account in energy transition scenarios. Some energy models include quantifications of sufficiency potentials, and studies provide recommendations on how best to do it. Theoretical assessments of potentials are a key step; but making a convincing case as to the credibility and plausibility of these potentials appears to be another important matter.

The reason is that sufficiency potentials are provoking specific doubts and sometimes reluctance, that may be due to their nature, limitations, and other (more or less subjective) reasons. In this paper, we propose an exploratory investigation and typology of these objections, and factors that are likely to aggravate them. The analysis is notably based on the experience of the French négaWatt Association on the way its sufficiency-based energy scenario published 17 years ago has been received by various audiences since then.

We then suggest and discuss ways to increase the trust in and acceptance of sufficiency potentials, through recommendations on how to improve their robustness and how best to communicate them (supporting explanations, effective arguments, importance of co-benefits, use of narratives, etc.).

Introduction and context
There is a growing understanding that energy efficiency improvements alone may not be enough to curb energy demand in line with the 1.5 °C or even 2 °C global climate goal. As energy efficiency measures tend to focus on technical optimisation and seldom question the need for energy services in the first place, approaches touching on behavioural and societal organisation changes – encompassed in the 'sufficiency' concept – are also called for by an increasing number of experts (Druckman et al 2010). Although there are varied conceptions of what energy sufficiency entails depending on the conceptual lens and scope considered (Toulouse et al 2019), most definitions in the literature have in common the idea of rethinking and redesigning individual and collective practices to favour activities and services that are intrinsically low on energy use (Toulouse et al 2017).

The need for sufficiency is not only shared by experts, but also by a seemingly significant part of the public. In a French opinion poll, to the question 'How can we solve climate change?', only 9 % believed that technical progress will provide the solution

Improving sufficiency assumptions

- Favouring a systemic approach
- Building on available social science material
- Carefully considering pace of change and limits
- Choosing the best terms and arguments for target audiences (co-benefits, etc.)
- Using narratives and comparisons
- Mitigating ‘emotional’ reactions
- Increasing consistency between approaches & experts

enough

International Network for Sufficiency Research & Policy

ENOUGH on ResearchGate

Sufficiency on Wikipedia

Sufficiency and modelling - The nW approach

Mathilde Djelali
Yves Marignac

The négaWatt association

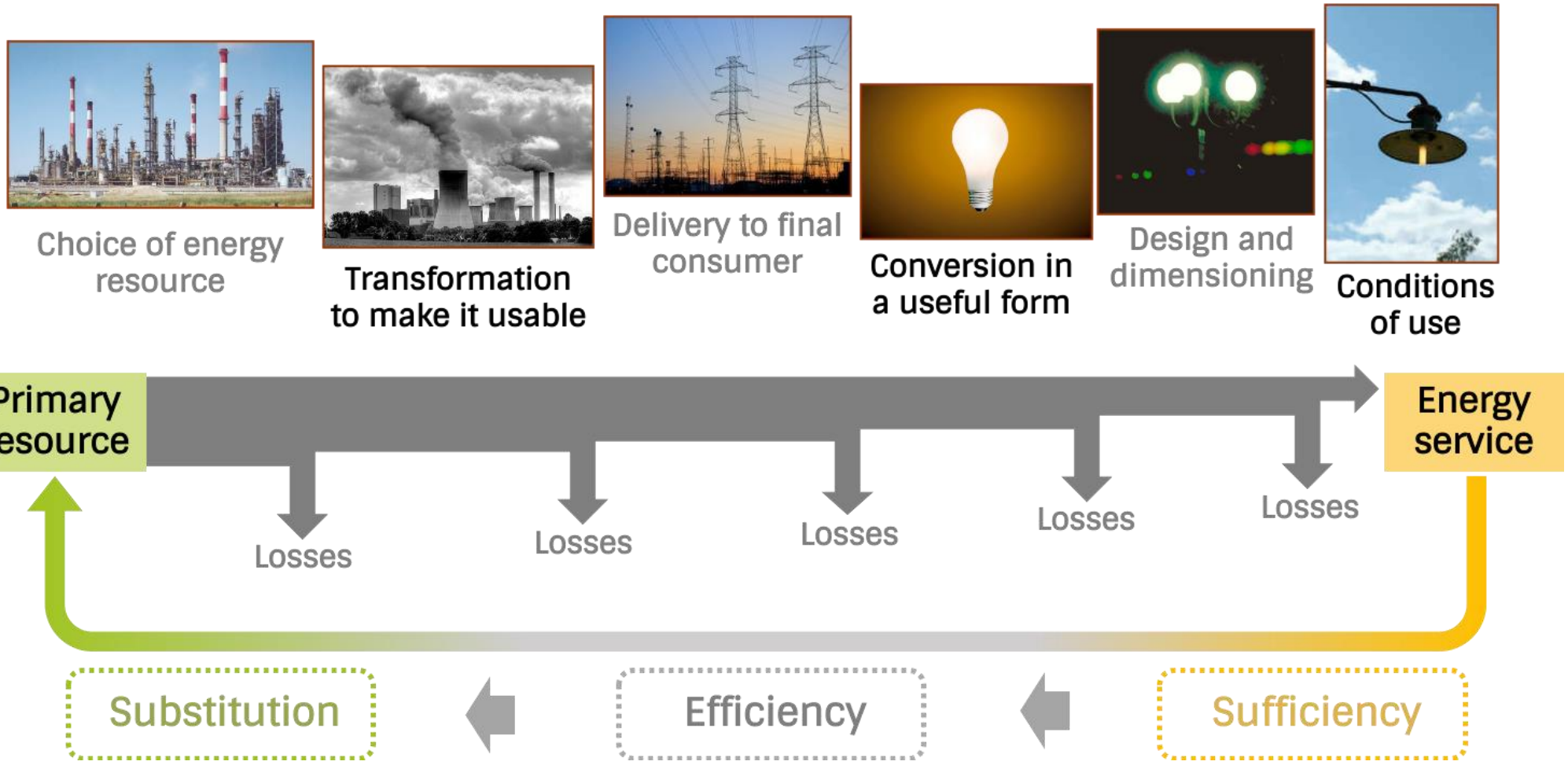
ASSOCIATION négaWatt

- A think tank on energy created in 2001
- A non-profit, independent group of experts and field-practitioners
- A core of – 25 “companions” + 25 “ambassadors”, 1200 members
- Producing sustainable energy scenarios (latest in 2017) and proposing systemic policies and measures

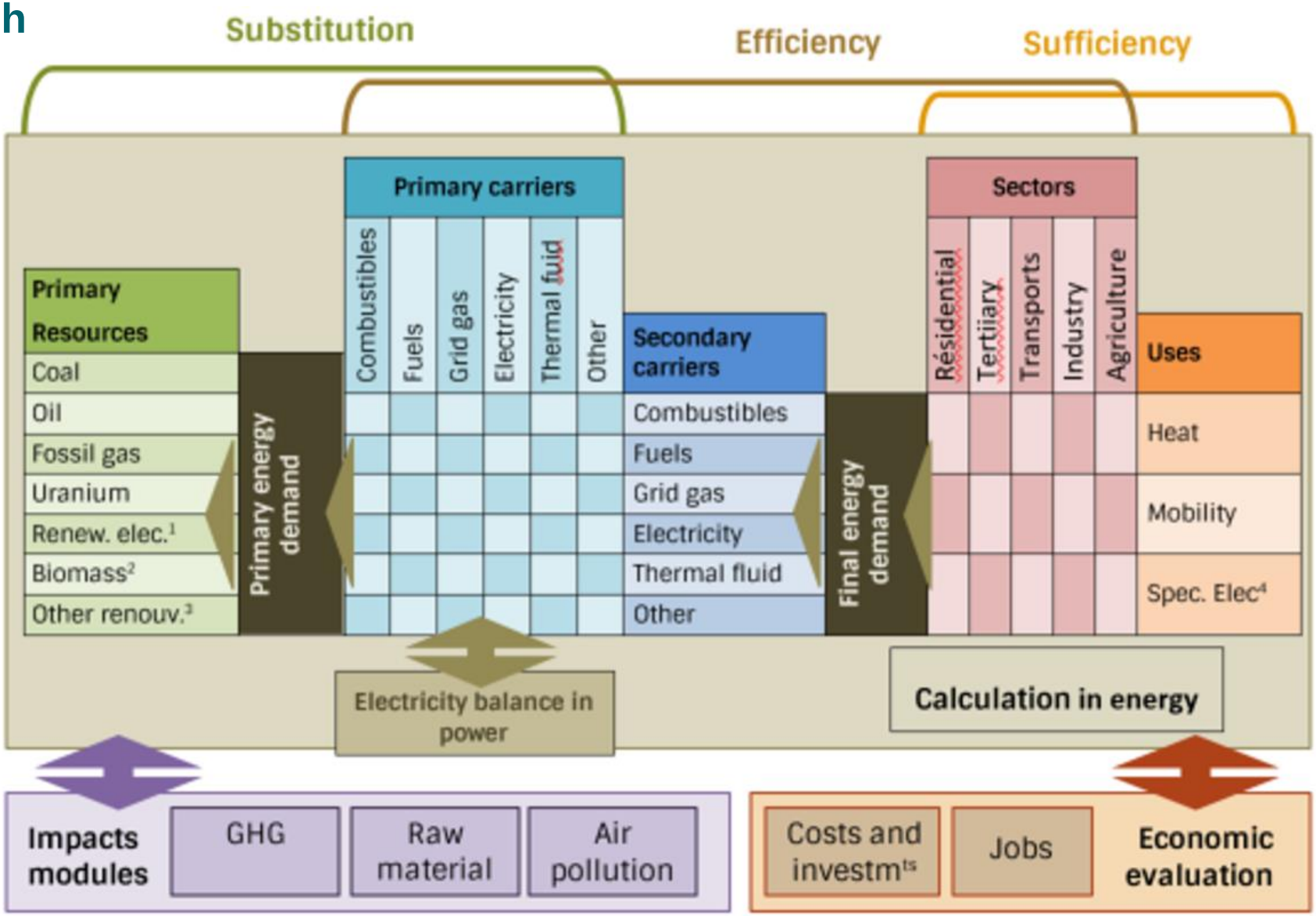
INSTITUT négaWatt

- Subsidiary created in 2009
- Operational branch of the association

Systemic approach



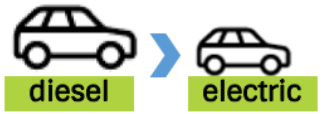
Modelling approach



Sufficiency leverages

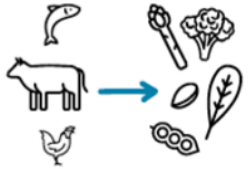
1 **Servicial** — Intensity and duration of use of equipments

2 **Dimensional** — Size, nominal capacity of equipments

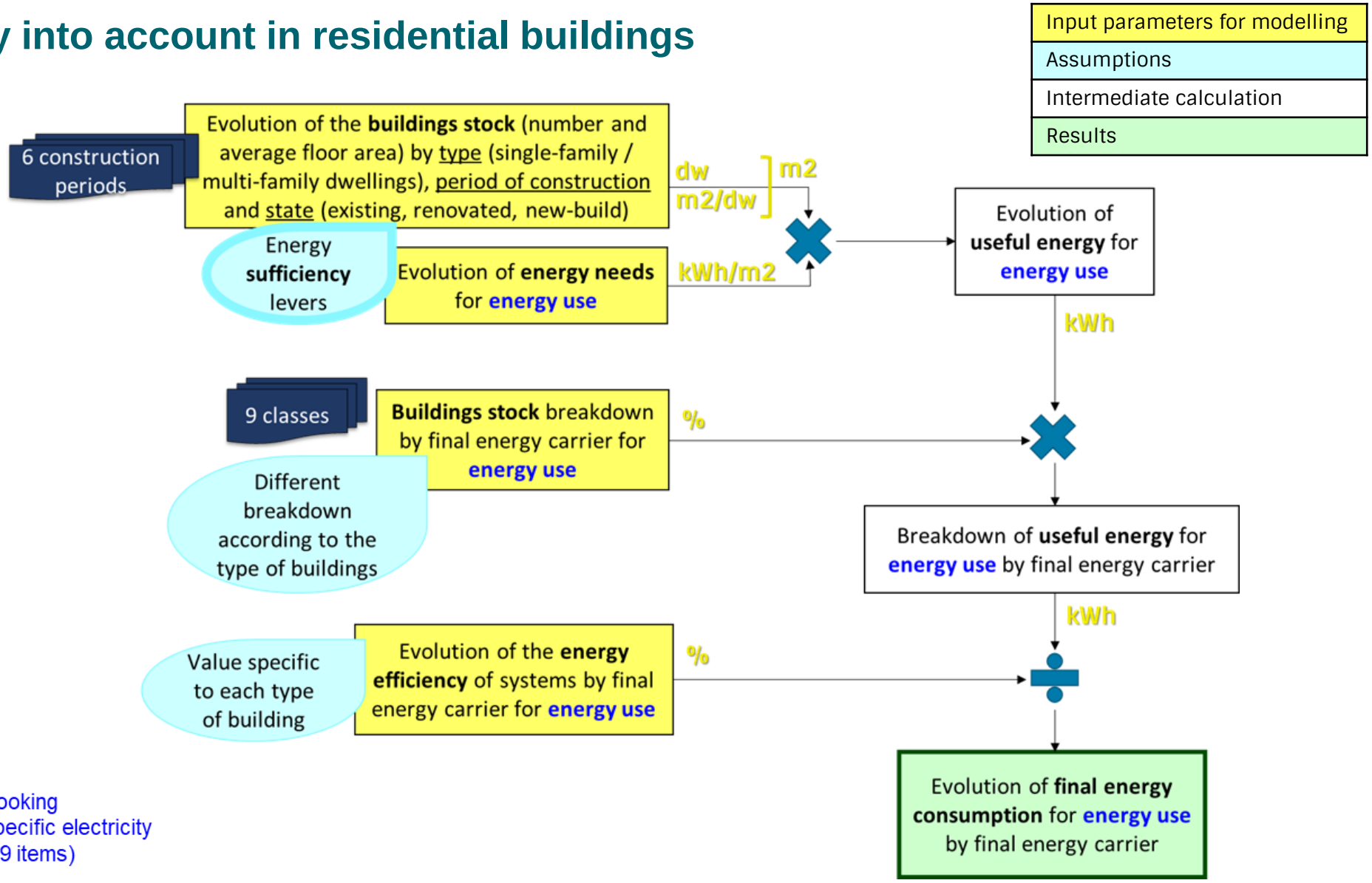


3 **Organisational** — Collective planning and sharing

\+ Sufficiency on other goods and food



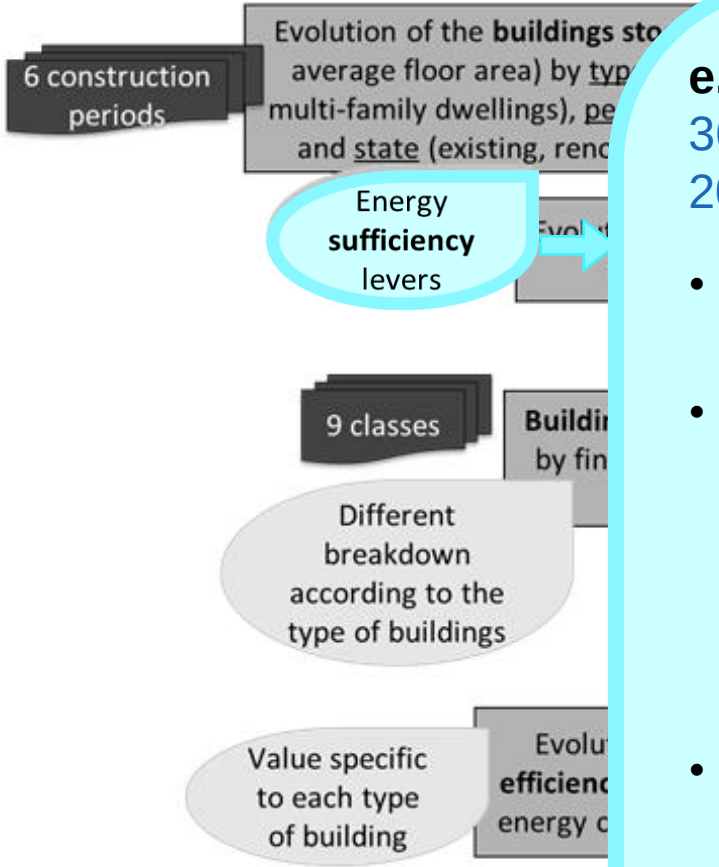
Taking sufficiency into account in residential buildings



Energy end-uses:

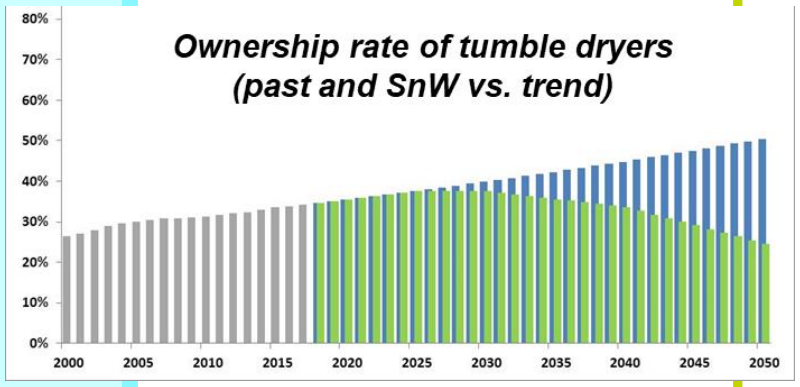
- Heating
- Cooling
- Domestic hot water
- Cooking
- Specific electricity (19 items)

Taking sufficiency into account in residential buildings



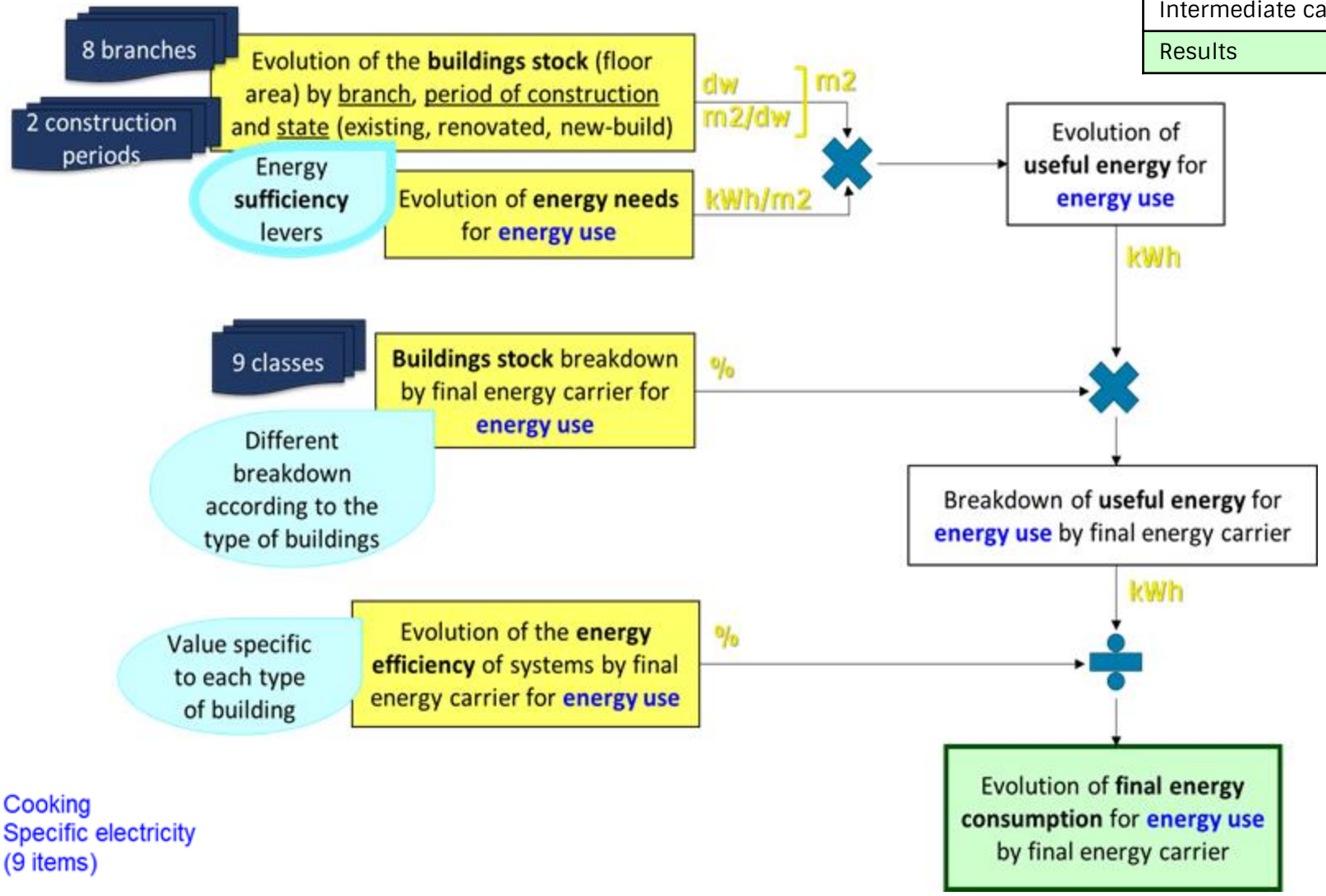
e.g. Tumble driers (ownership rate): Down from 36% of households equipped in 2015 to 28% in 2050

- Based on past trend, setting a BAU growth to an ownership rate of 50%.
- Then, taking into account the sufficiency rationale against this use (energy and material), imagine a progressive shift to line drying, collective driers, shared driers, though maintaining a fair rate of individual driers (i.e. not forbidding them)
- Need to illustrate the feasibility and availability in most cases, but also take into account situations where no alternative is viable



Taking sufficiency into account in tertiary buildings

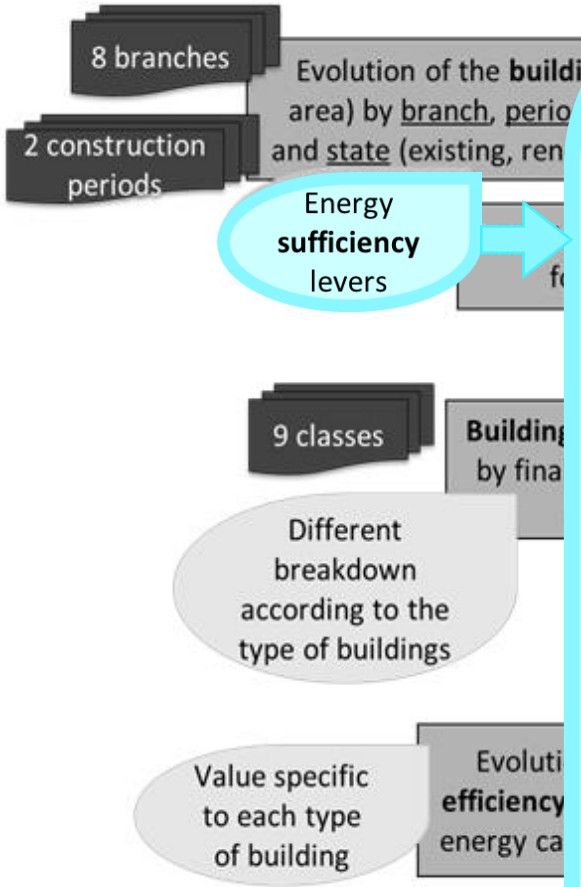
Input parameters for modelling
Assumptions
Intermediate calculation
Results



Energy end-uses:

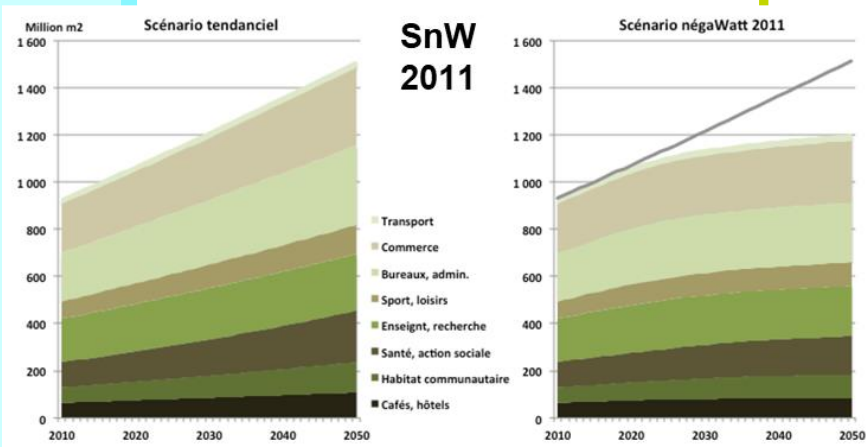
- Heating
- Cooling
- Hot water
- Cooking
- Specific electricity (9 items)

Taking sufficiency into account in tertiary buildings

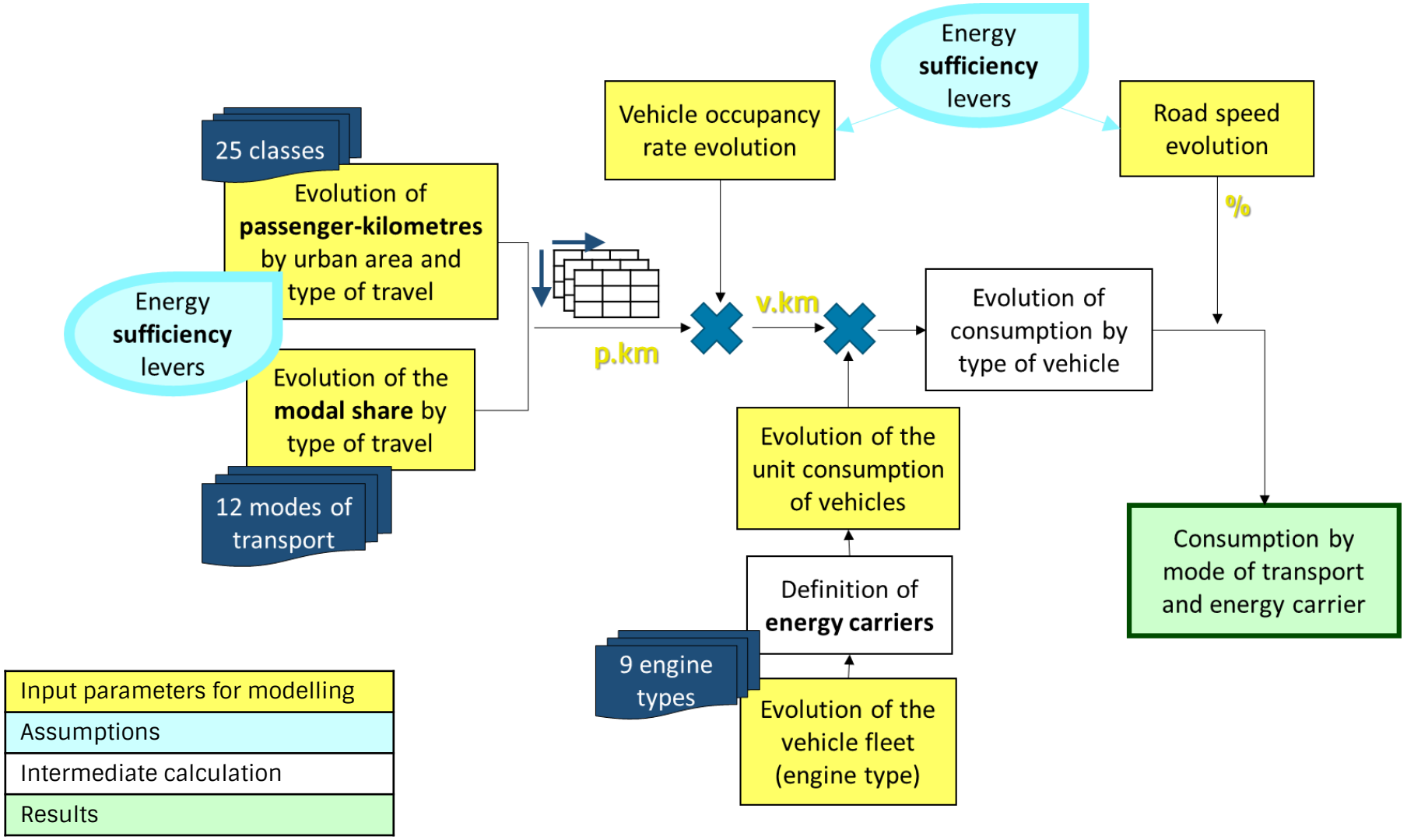


e.g. Tertiary floor areas: 26% global growth of the surface of tertiary buildings over 2010-2050, or 9% per person in total

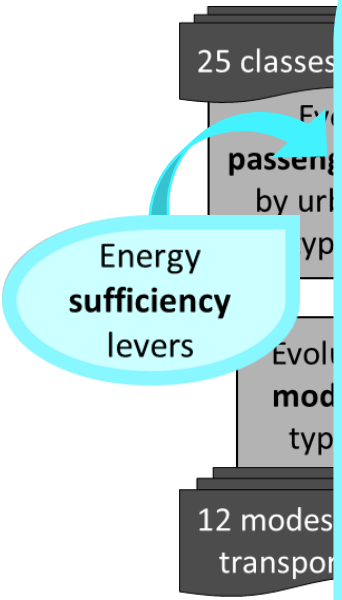
- Analysis of past and current <u>trend</u>: towards faster growth of tertiary surfaces than in the population
- Need to question the growth rate that seemed <u>unnecessarily high</u>
- → "Corrective" assumption to align the two
- Introduction of a <u>differentiated growth per activity</u> sector to be more consistent with certain <u>demographic dynamics</u> (e.g. ageing of population)



Taking sufficiency into account in transport: passengers mobility

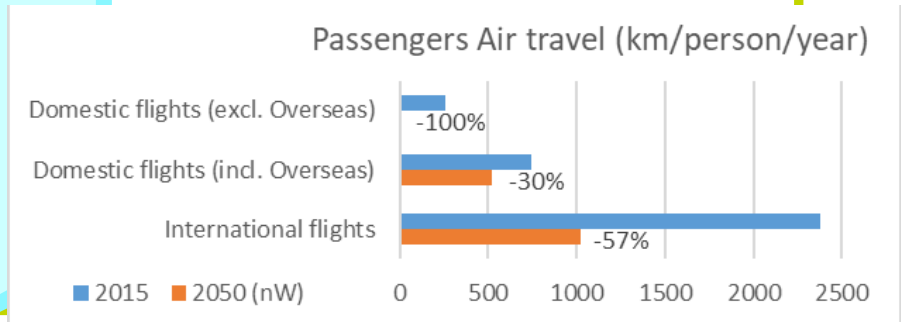


Taking sufficiency into account in transport: passengers mobility

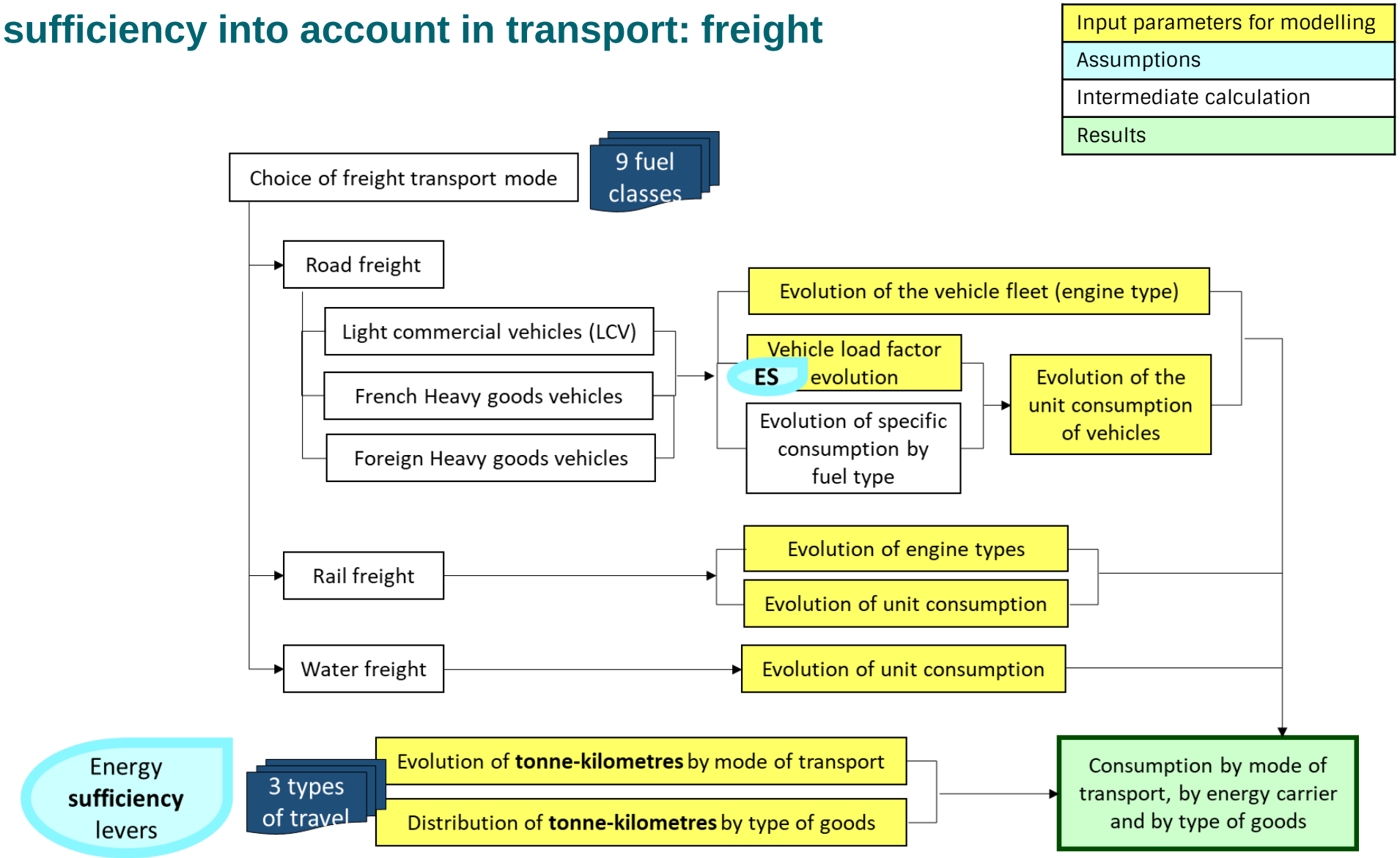


e.g. Air travel (distance travelled, pkm) : A reduction from 3121 km/person in 2015 to 1540 km/person in 2050

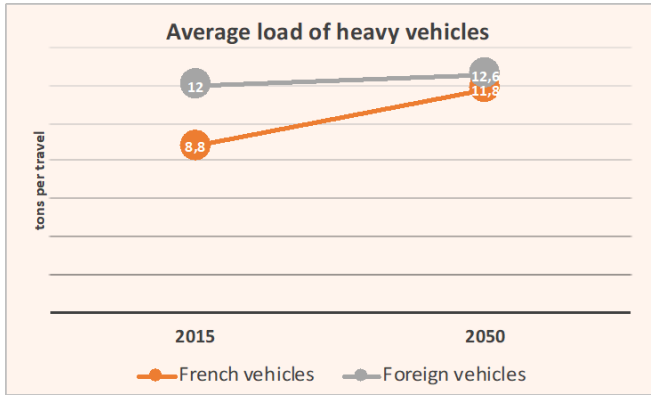
- Premise: we need to consume less.
- So we look at where this is possible and we believe that a reduction can be obtained on long distance mobility → "relocation of leisure" (cf. summer 2020).
- No sustainable alternative in production: the substitution lever is clearly not possible in the short or medium term. → No other option than to use the sufficiency lever.
- Despite no supporting literature on long-distance mobility, adoption of strong assumptions in contradiction with the trends (excluding Covid-19).
- → Stress the very strong inequalities observed today in access to air travel and the unsustainable spread of this behaviour.



Taking sufficiency into account in transport: freight

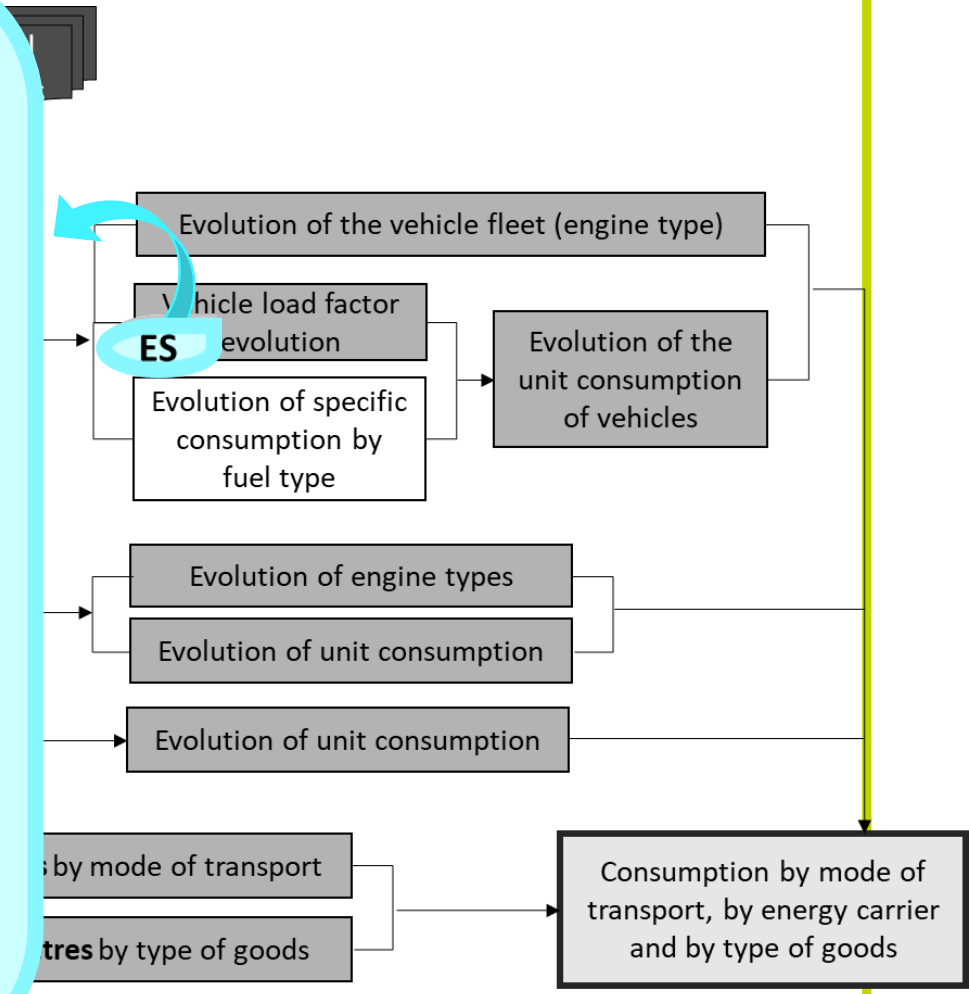


Taking sufficiency into account in transport: freight

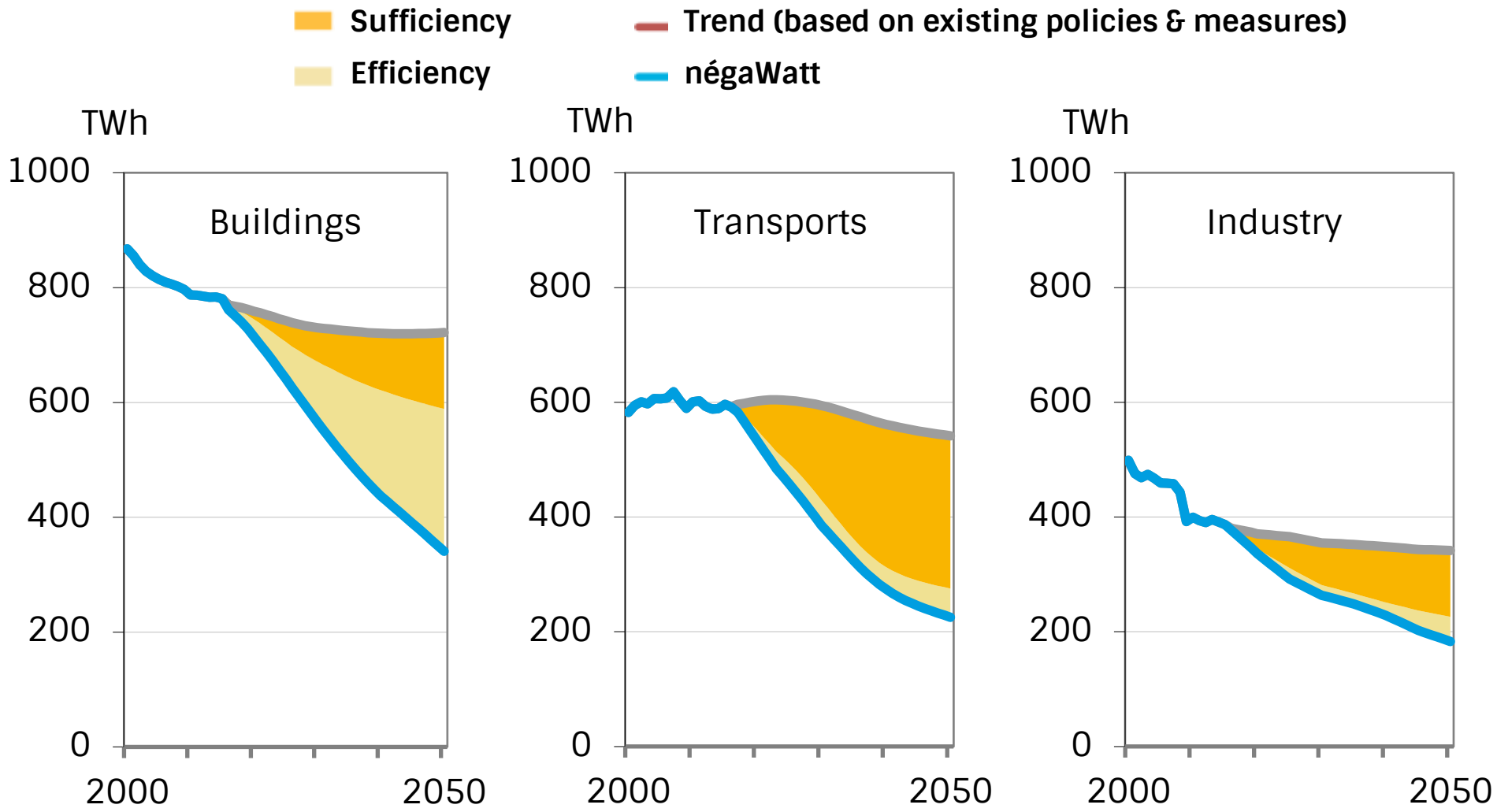


e.g. Vehicle load factor: Increased load factor of heavy vehicles, from 8.8 t to 11.8 t for French vehicles, and 12.6 t to 12.6 t for foreign ones

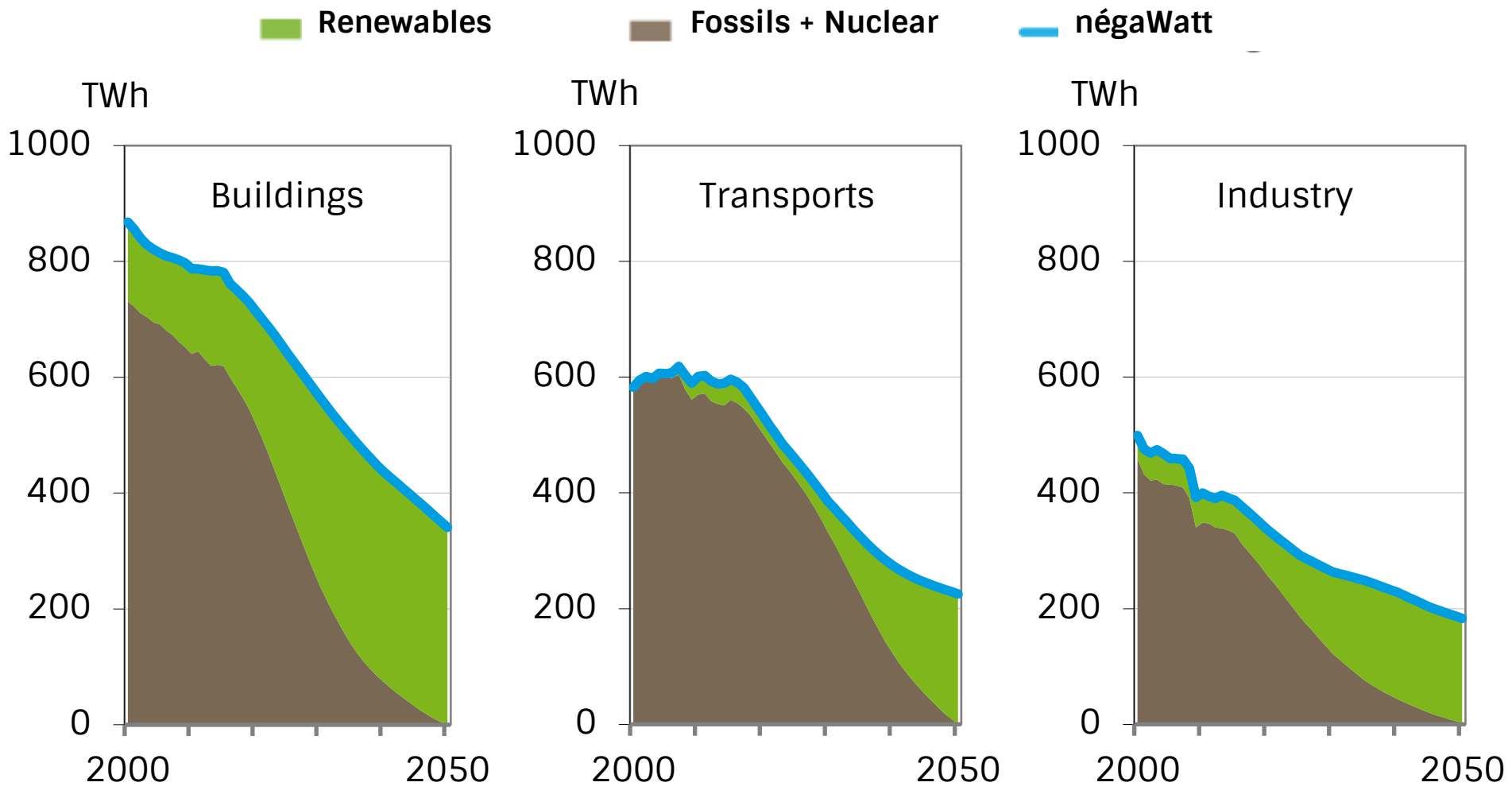
- Trend is negative due to optimisation policies focusing on limiting stocks rather than limiting unnecessary transport.
- Policies can revert this, especially regarding medium distance transport: even if not much studied in France, good return of experience on effective policies (e.g. tax system in Switzerland)



Role of sufficiency



Getting to 100% renewables and climate neutrality



Building sufficiency assumptions: an approach similar to other assumptions

- **Developing energy efficiency (EE) and energy sufficiency (ES) assumptions: is it different?**

  Technical versus societal? Not so much!

  - Penetration rate of equipment in households, evolution of engine types for cars, size of fridges, choice of transport mode…

  - … always a combination of technical availability / feasibility and decisions by consumers / stakeholders…

  - … similarly influenced or triggered by regulations, taxes, public information, incentives, etc.

  Depending on existing data and studies available? Very much so!

- **Due to better documentation, access to more important data, and nowadays less culturally challenging assumptions, EE has become easier to deal with**

- **SE is new, less documented and more challenging, but it is not more difficult by nature**

Basic principles and difficulties for setting sufficiency assumptions

Global approach (to be adapted depending on items):

- Characterizing the **existing level of service** through identified relevant **indicators**
- Identifying relevant **drivers** and corresponding **levers**
- Developing **quantitative and qualitative reasoning** to project the evolution of services through drivers and levers: *how needed vs extravagant?*
- Using **available material** to assess and justify the possible range of action
- Building on a combination of normative / practical reasoning about **necessity and feasibility**

Main issues:

- **Quantifying** ES assumptions and properly **modelling** them
- **Justifying** ES assumptions (getting them right and acceptable) **:** difficult comparison with scenarios where ES is valued negatively
- **Correctly translating** the assumptions into clearly understood **narratives**
- Dealing with the **rebound effect**
- Bearing in mind the **energy poverty** issue

Obstacles and examples

Stumbling blocks/major obstacles	Examples of ES assumptions	
	Buildings	Transports
Lack of statistical data • inappropriate indicators, • insufficient level of disaggregation, • missing information on past trends	Hot water consumption	Modal shift towards walking
Lack of supporting literature • empirical studies • documented results of policies & measures • impacts / co-benefits	Cohabitation rate in households	Vehicle occupancy rate
Individual representation of comfort • consumption patterns / happiness • individual freedom vs. constraint • individual burden of action	Heating temperature Teleworking	Speed limit Travelled distances
Societal representation of lifestyles • consumption patterns / social success • idea of modernity (high tech, speed…) • individual choice vs. normative uniformity	Size and type of dwellings IT equipment (number and size)	Size and type of cars Limitation of air travel
Economic representation of progress • consumption patterns / growth • unwanted impact on specific sectors • adverse economic drivers (competitiveness…)	Evolution of tertiary floor areas	Tonnages transported

Sufficiency and modelling: the nW experience

- Reasoning on sufficiency:

  - Examining **energy services**

  - Working on **new indicators**

  - Bringing to light **new drivers and levers**

- Using a **disaggregated physical bottom-up modelling** based on energy services:

  - Quantification of **the role of and need for energy sufficiency** in meeting deep sustainability objectives

  - **Demonstrated ability to quantify and justify sufficiency** assumptions even in the absence of statistical data and supporting literature

  - **Support** for identifying and discussing **sufficiency policies and measures**

Sufficiency and modelling - The Nordic Baltic Energy Programme approach

Gunnar Boye Olesen

Sufficiency and modelling in the Nordic Baltic Energy Programme on sufficiency and modelling project

Report from the project "Integrating energy sufficiency into modelling of sustainable energy scenarios" with Aalborg University(DK), Lithuanian Energy Institute, Green Liberty(LV), INFORSE-Europe.

Supported by Nordforsk.

Gunnar Boye Olesen

CACTUS Kick-off meeting (online) 9/10 2020

INFORSE-EUROPE

International Network for Sustainable Energy

INFORSE-EUROPE

- A network of +50 civil society organisations working for a transition to 100% sustainable energy
- Include ”energy sufficiency” in concepts & modelling

Currently involved in:

- “Integrating energy sufficiency into modelling of sustainable energy scenarios” with Aalborg University(DK), Lithuanian Energy Institute, Green Liberty(LV). Supported by Nordforsk
- European sufficiency scenario network w.négaWatt ao.

INTEGRATING ENERGY SUFFICIENCY INTO MODELLING OF SUSTAINABLE ENERGY SCENARIOS”

1. Integrate sufficiency aspects into energy modelling tools that have been applied for development of sustainable energy scenarios (EnergyPlan, MESSAGE models)
2. Develop modified Danish, Latvian and Lithuanian national sustainable energy scenarios, which build upon the combination of sufficiency, efficiency and renewable energy
3. Create national policy dialogues among public and private actors in the Nordic and Baltic countries about energy scenarios that include demand changes from a sufficiency perspective and discuss the feasibility of these scenarios and the possibilities and limitations for socio-economic and regulatory changes to move towards these scenarios
4. Disseminate the methodology for integration of sufficiency into energy modelling tools and scenarios and the experiences with developing and applying to Nordic and Baltic stakeholders and to scientific journals

RESEARCH QUESTIONS

A. What can influence the preferences for increased quantitative consumption compared with qualitative improvements in consumption?
B. How can sufficiency, understood as changes in consumer preferences, be integrated in energy modelling tools?
C. How much can energy sufficiency with changes of citizen preferences contribute to reduction of greenhouse gas emissions in 2030 and 2050?
D. How can policies influence preferences for qualitative improvements versus quantitative increases?

HOW FAR ARE WE AFTER 9 MONTHS

- Definition of sufficiency
- Integration in energy modelling, with pre-calculations
- Indentifying sufficiency actions and policies for them
- Quantifying effects of sufficiency actions and policies

DEFINITION OF SUFFICIENCY

Two dominant concepts

- Efforts to reduce energy service consumption, leading to a reduction in the direct, associated environmental impacts from energy consumption

(energy sufficiency actions)

- A state in which people’s basic needs for energy services are met equitably and ecological limits are respected

Two types of scenarios

▷**Models without energy sufficiency**

➢The integration of energy sufficiency measures identified in the project can show ways to increase ambitions and/or reduce investment needs and costs

▷**Models with normative assumptions for energy sufficiency**

➢The comparison with sufficiency measures identified in this project can qualify normative assumptions and (probably) increase credibility

Examples

▷Model without energy sufficiency in personal transport

➢**IDA Klimasvar**: Personal transport increase 22% (’20-’30)

▷Car use is reduced with 2% of car transport to public transport, 2% to bi-cycling.

▷Other actions: 46% el.-cars, ICE cars 16% more efficient

➢Direct emissions 42% reduced

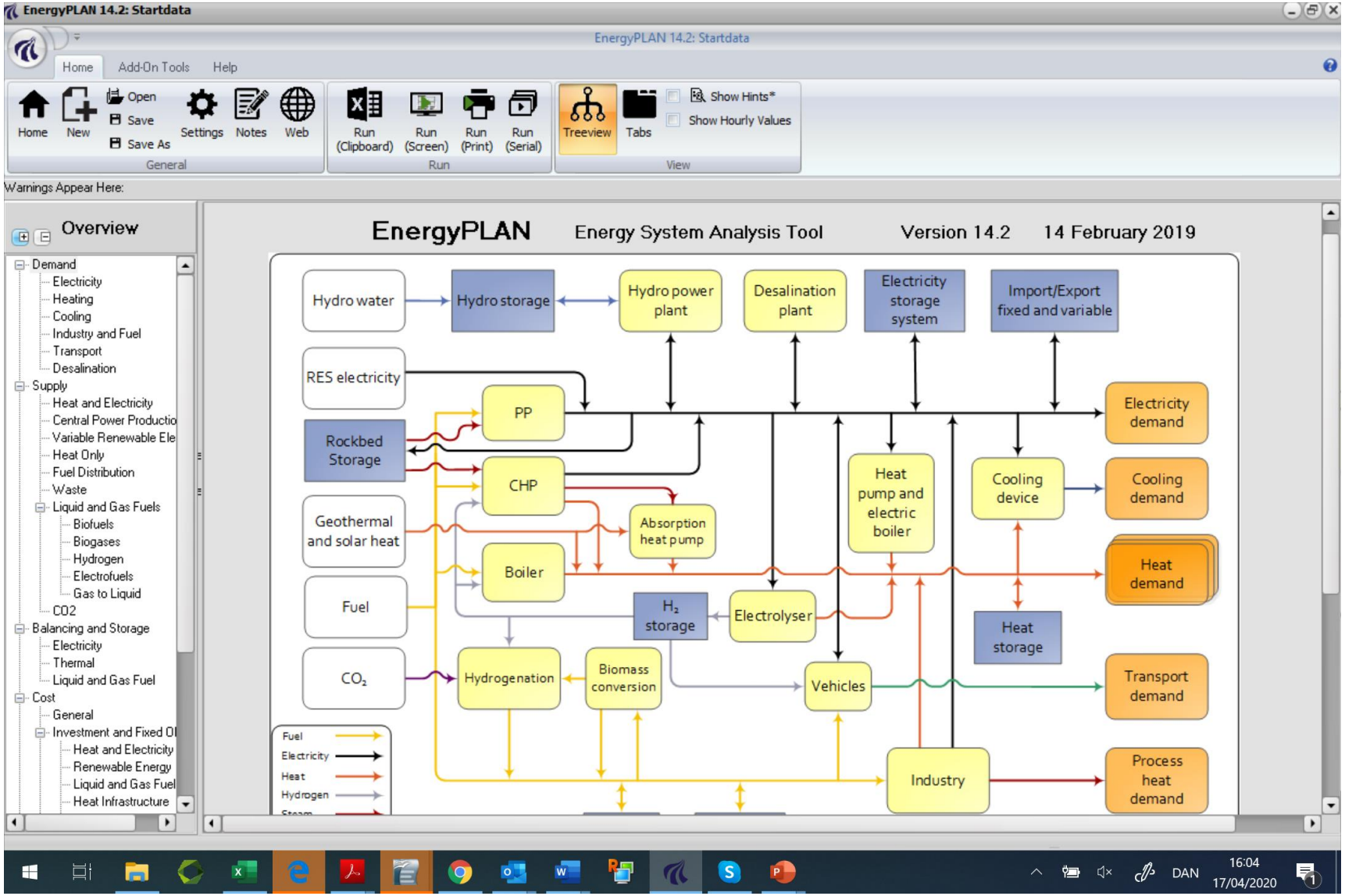
▷Model with normative sufficiency in personal transport

➢**SustainableEnergy/INFORSE ’30**: Pers. transport red. 6% (’15-’30)

▷Car use is reduced with sufficiency, 30% to public transport, 3½% to bicycles

▷Other actions: 51% el.cars, 15% H2-cars, ICE cars 21% more eff.

➢Direct emissions 80% reduced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Liquid and Gas Fuel
Heat Infrastructure
EnergyPLAN
Energy System Analysis Tool
Version 14.2
14 February 2019
Hydro water
Hydro storage
Hydro power plant
Desalination plant
Electricity storage system
Import/Export fixed and variable
RES electricity
PP
Rockbed Storage
CHP
Geothermal and solar heat
Absorption heat pump
Boiler
Fuel
H_2 storage
Electrolyser
CO_2
Hydrogenation
Biomass conversion
Vehicles
Industry
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Cooling device
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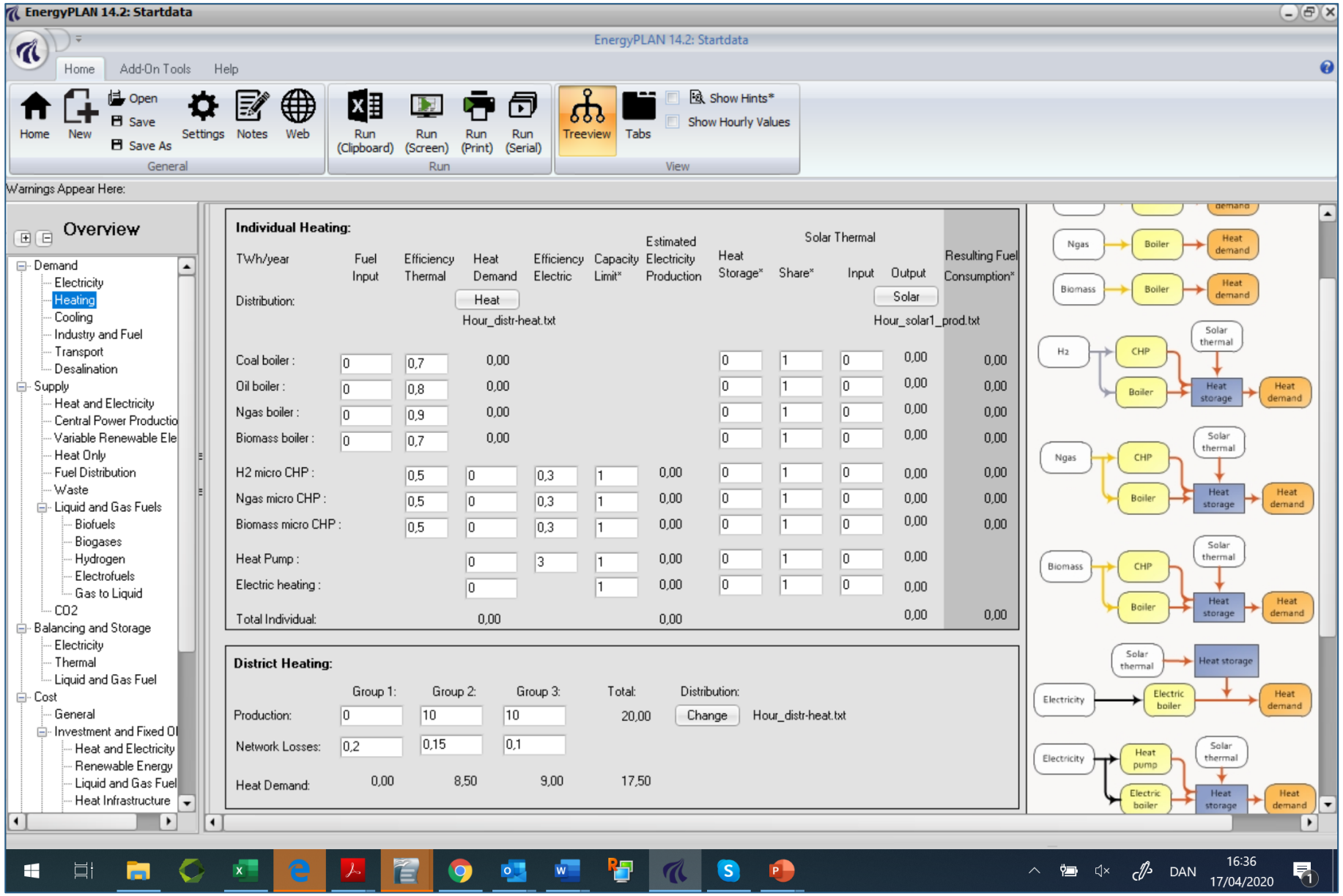
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Solar
Hour_solar1_prod.txt
Coal boiler :
Oil boiler :
Ngas boiler :
Biomass boiler :
H2 micro CHP :
Ngas micro CHP :
Biomass micro CHP :
Heat Pump :
Electric heating :
Total Individual:
District Heating:
Group 1:
Group 2:
Group 3:
Total:
Distribution:
Production:
Change
Hour_distr-heat.txt
Network Losses:
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Ngas
Boiler
Heat demand
Biomass
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CHP
Solar thermal
Heat storage
Electricity
Electric boiler
Heat pump
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Heating sufficiency is to be integrated in input

- Heat demand = heat service demand * building heat efficiency – free heat
- Heat service demand = heated area * Av. temp difference (indoor <> out)
- Sufficiency can then be:

I. Reduce (limit) heated area
II. Reduce temperature difference (indoor <> out)

Sufficiency actions, examples

Sufficiency actions	**Reduction in sector**	Policy	Action period	**Source**
Move to smaller dwellings, assist.	8%	Advise, remove barriers	2020-30	UBA-study, Germany
Divide dwellings, assistamce	7%	Advise, remove barriers	2020-30	UBA-study, Germany
End DK com-muting tax break	3%	Stop subsidy	2014-20	According til DEA, Denmark
CO2-tax 200->1500 DKK/ton	5-10%	Carbon tax	2020-30	Climate Council, Denmark
1 million electric cars	2% (less cars)	Car tax reform, CO2+300 DKK/t	2020-30	Green car Commissionen, DK
Cut washing by half i dwellings	10%	n.a.	n.a.	Theoretical example

Sufficiency effect on demand	Demand in scen., TWh	Demand type	Sector for sufficiency	Sector fraction*	Grid loss	Sufficiency action 1	Sufficiency action 2	Demand with sufficiency, TWh
Heating, N-gas	9,33	Gas demand	Residential	83%	0	8%	7%	8,21
Heating, oil	1,06	Oil demand	Residential	88%	0	8%	7%	0,92
Heating DH2	17,89	Heat supply	Residential	70%	17%	8%	7%	16,39
Heating DH3	17,89	Heat supply	Residential	70%	17%	8%	7%	16,39
Transport, diesel	28,98	Fuel use	Person. cars	48%	0	7,5%	3%	27,55
Transport, petrol	17,33	Fuel use	Person. cars	100%	0	7,5%	3%	15,55
Transport el., smart	2,15	El. end use	Person. cars	50%	0%	7,5%	3%	2,04
Electricity demand**	46,32	El. supply	Residential	45%	6,5%	10%	0%	44,37
* Fraction of sector with sufficiency action of total demand category in Energy Plan								
**Not including electricity use in transport and heating								

Costs calculations forsufficiency actions

- EnergyPLAN calculates social costs of energy, including a CO_2/GHG price but without other externalities or sociatal effects
- Saved fuel costs, variable O&M, and GHG emissions are output of EnergyPLAN
- Possible saved investments and saved fixed O&M can be found with manual optimisation, by manually reduce capacity of power and heating plants etc.
- The model does not include grid costs and costs outside the energy system, but investments outside energy supply can be included (electric and normal cars, grid investments, any other investments, but not ”negative investments” as less houses to be built)

Supplementary Considerations

- ▷Does the demand change hourly variations?
- ▷Are rebound effects included in sufficiency estimations?

Other uses, for instance of transport, buildings?

Economic rebound?

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INFORSE-EUROPE

International Network for Sustainable Energy

Sufficiency in Central and Eastern Europe

Hungary

Relevance of sufficiency in the transport and building sectors

Mária Bartek-Lesi and Bettina Dezsi

SUFFICIENCY IN THE BUILDING AND TRANSPORT SECTORS OF HUNGARY

Bettina Dézsi and
Mária Bartek-Lesi

Regional Centre for Energy Policy Research (REKK)

CACTUS Project
Kick-off Workshop
09.10.2020

Outline

Building sector

▷Where does Hungary stand compared to the EU average?

Basic dwelling and household characteristics
Energy consumption trends
Behavioral aspects

▷Does sufficiency appear in the existing climate and energy strategies?

Main targets and measures set in national strategic documents:

National Energy and Climate Plan
National Energy Strategy
National Building Energy Strategy

Transport sector

▷Where does Hungary stand compared to the EU average?

Per capita energy consumption in the transport sector
Modal split
Car ownership

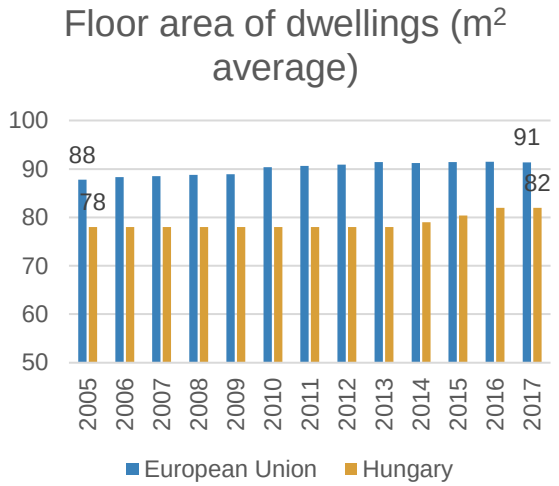
▷Does sufficiency appear in the existing climate and energy strategies?

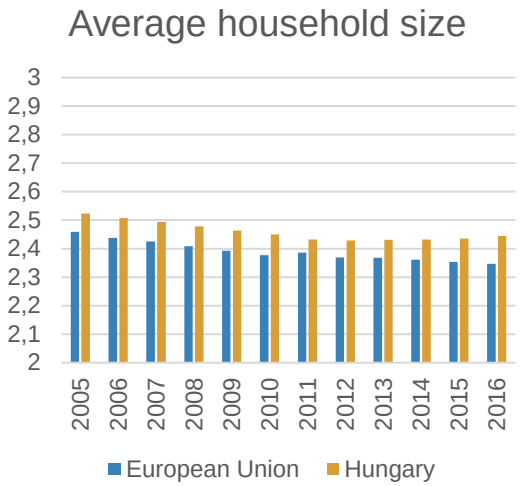
Main targets and measures set in national strategic documents:

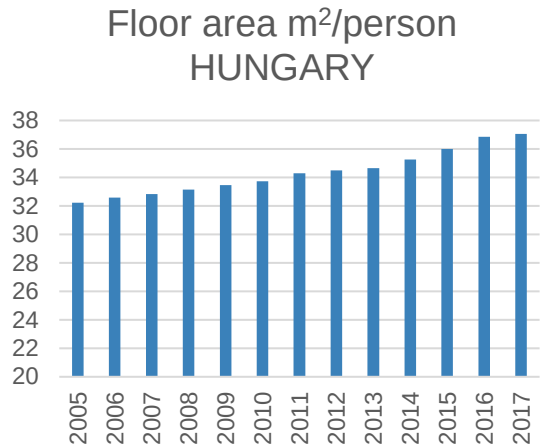
National Energy and Climate Plan
National Energy Strategy
Transport Infrastructure Development Strategy
Budapest Transport Development Strategy

BUILDING SECTOR

Trends in basic dwelling and household characteristics







▷Floor area of buildings is generally growing both in Hungary and Europe-wide

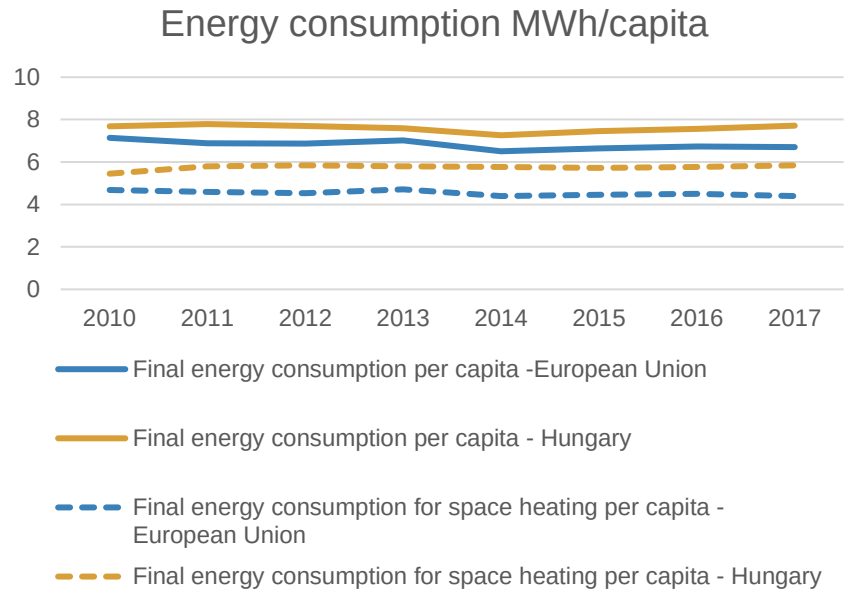
▷Size of an average household shows the same decreasing trend

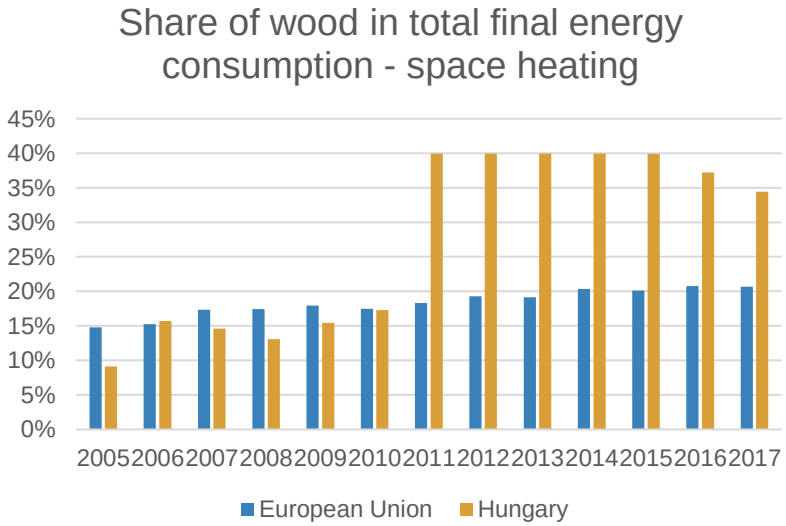
▷Despite stagnating Hungarian household size since 2011, floor area per capita is expanding (+15% over 12 years)

Source: Odyssey-Mure Database

Energy consumption trends in the residential sector

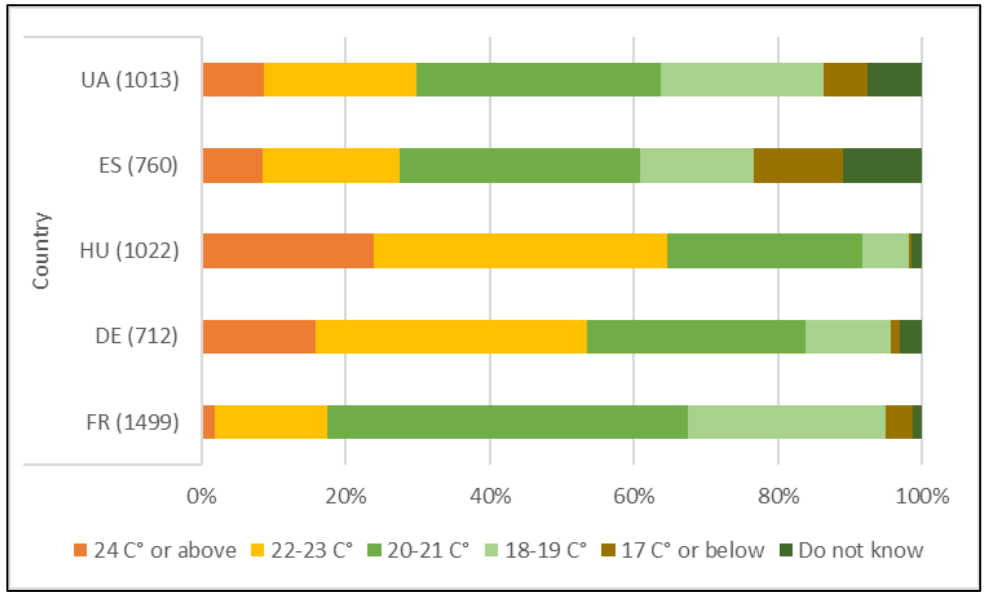
- ▷Higher values for Hungary in both final consumption and energy consumption for space heating
- ▷Share of space heating compared to total final consumption is rising
- ▷Introduction of regulated energy prices in 2014 resulted in increased consumption
- ▷Biomass consumption statistics were retrospectively reestimated back until 2010





Source: Odyssey-Mure Database

Behavioural aspects of heating energy use



▷According to a household survey carried out in 2018 in 5 EU countries, around 65% percent of Hungarian households heat their rooms to termperatures above 22 °C, and 24% above 24 °C.

▷Although subjectively assessed by respondents, this is a high share compared to other countries (The result is independent of whether it is possible to control the level of temperature in the dwelling.)

(*Source: www.enable-eu.com)*

- According to the same survey, only 14% of Hungarian households would like to receive feedback on their consumption level compared to previous periods or other similar households. The same share is above 40% in the other countries.
- Around 22% would like to receive targeted advice on energy saving options, compared to 44-78% of households in the other four countries.
- These might reflect the impact of regulated utility prices for households introduced in 2013.

National Energy and Climate Plan

Findings

▷Hungarian residential energy usage is 37,5% higher than EU28 average in 2015, since then energy efficiency indicators also deteriorated

▷NECP estimation shows 35-42% of underheating ratio depending on building type

▷NECP highlights energy saving potential in public institiutions (~960 thousands buildings) which value can approach 15-30% in 5 years

Measures

▷Introduction of ESCO certificates

▷Long-term renovation strategies

▷Policies and measures to remove regulatory and non-regulatory barriers

▷**Awareness raising programs** to support energy efficiency measures

▷Energy Efficiency Innovation Programme:, development and dissemination of building automation, building supervision and control systems

▷Building Energetics Tender Program with 1,1 million EUR/year budget

National Energy Strategy (2020)

▷Approximately 2/3 of the Hungarian building stock needs to be modernized energetically, 12% are in sub-scale condition

▷Various estimates put the annual amount of potential energy savings at 110-130 PJ, about 60% of the savings can be identified for buildings

▷According to the Energy Performance of Buildings Directive all new buildings must be nearly zero-energy buildings from 2021

▷Mid-term strategic vision until 2050:

cost-effective transformation of privately owned residential buildings to become a highly energy-efficient and decarbionized building stock

deep renovation of 3% of governmental building stock every year

▷District heating: improvement of controllability; smart cost sharing, harmonization of seconder (renovation) and primer (system deployment) developments

▷For individual residential heating/cooling: increasing the share of energy-efficient, renewable solutions

▷Awareness-raising programs

▷Smart metering

National Building Energy Strategy (2015)

Strategic goals

▷Alignment with EU energy and environmental objectives

▷Building renovation with the aim of reducting utility costs

▷Reducing budget expenditures

▷Reducing energy poverty

▷Job creation

▷Reduction of GHG emmission

▷The Strategy's energy saving target builds mainly on new buildings and renovation supplemented by

Increasing energy efficiency in district heating buildings,

Renewable energy utilization,

Introduction of energy management systems,

Awareness raising, information, counseling, information exchange.

Conclusions on Hungarian policies in the building sector

▷The most important strategic documents focus primarily on energy efficiency

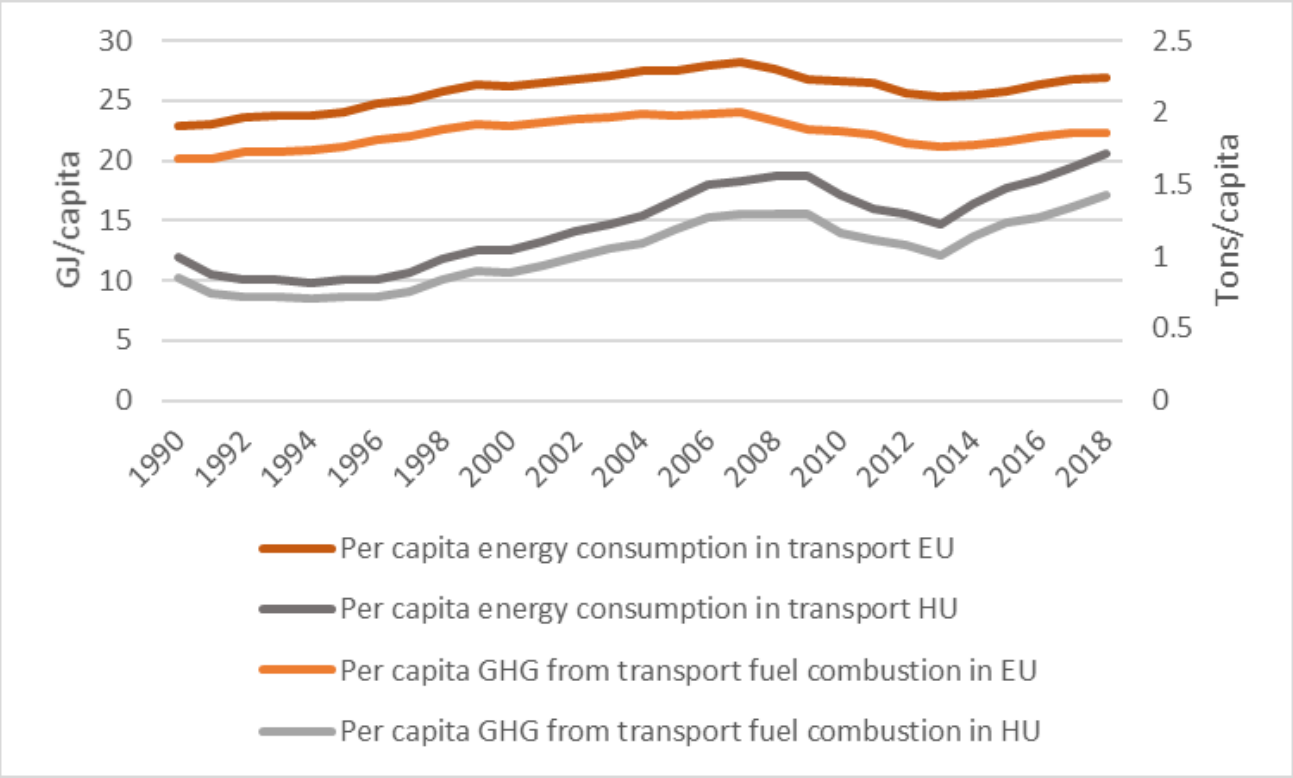
▷Significant measure in force work against sufficiency and efficiency targets

Introduction of regulated utility prices disincentivizes saving energy and reduces returns on efficiency investments

▷Raising awareness and energy-consciousness is the only measure to offset the effect of regulated utility prices, altough their effectiveness is questionable

TRANSPORT SECTOR

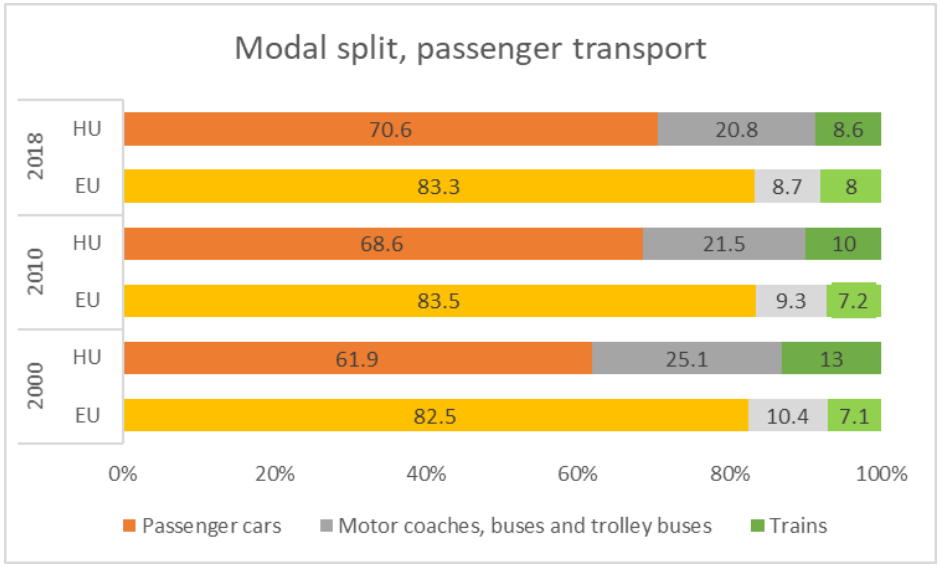
Trends of energy use and GHG emissions



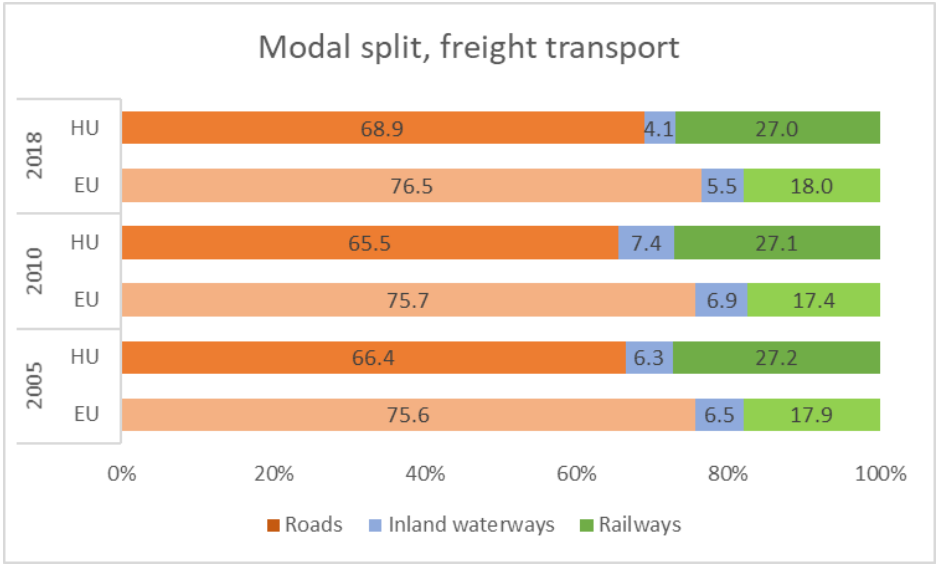
Per capita energy use and GHG emissions are lower than the EU average, but are increasing.

Source: Eurostat

Modal split



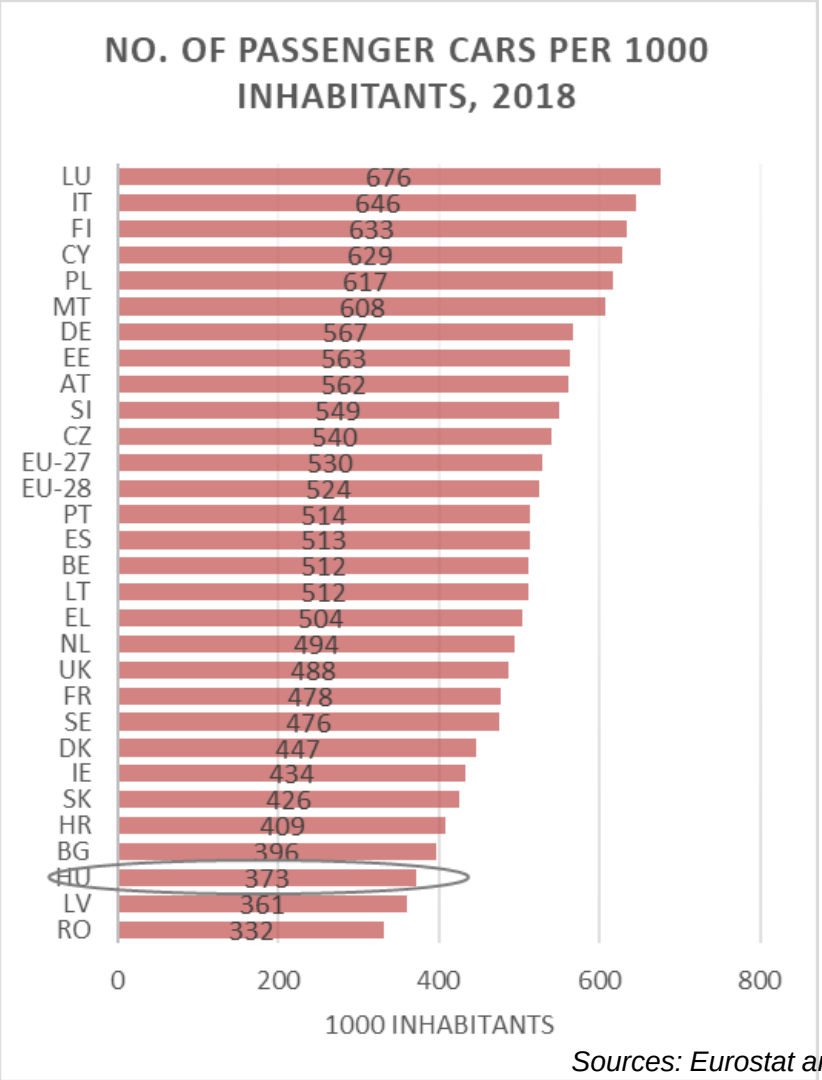
The share of individual transport is the second lowest in the EU in case of passenger transport, but it is growing.

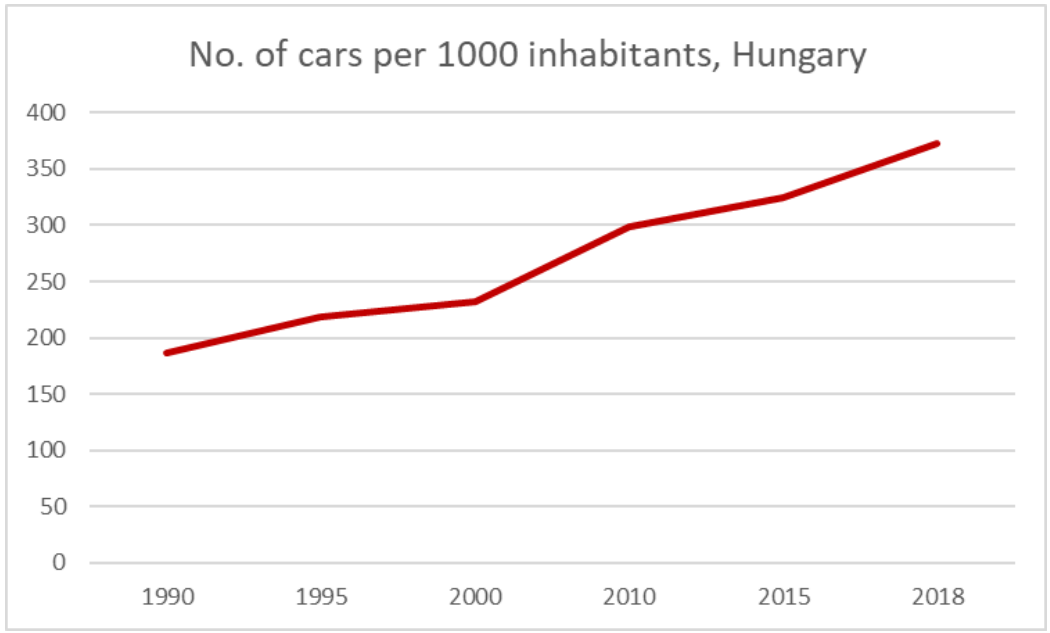


Road transportation is less dominant in Hungary than in the EU on average, but its share is increasing.

Source: Eurostat

Passenger





▷Hungary has the third smallest number of passenger cars per 1000 persons, but this number has doubled since 1990.

▷The share of used cars registered was about 50% in 2019 (MGE, 2020).

Sources: Eurostat and DG MOVE

National Energy and Climate Plan (2020)

▷*„Energy consumption in either the industry or in transport should not be limited in case of economic growth. We aim to ensure that GDP growth exceeds the rate of the increase in energy consumption at a growing rate."* (NECP p. 28)

▷Targets set for the transport sector:

Increase RES-T share to 14% by 2030 (7% conventional biofuels, 3.5% advanced biofuels + electrification)

Maximise the increase of petroleum products use at 10 % by 2030 in transport (NECP p. 55)

▷Measures outlined in NECP

Increased share of biocomponents in fuels

Green Bus Programme

Support of electric vehicles

Development of alternative fuel infrastructure

Support of intermodal transport

Promotion of public transportation

National Energy Strategy

Measures in addition to those included in the NECP:

-Promotion of new, alternative ways of mobility, e.g. car-sharing, car-pooling, bike-sharing, use of bicycles

-More efficient transport planning

-Increasing the stringency of environmental inspection of vehicles, as well as the requirements of registering used vehicles

-„*Promotion of telecommuting can help reduce energy consumption in the transport sector*" (no special measures are mentioned).

Hungarian Transport Infrastructure Development Strategy (2014)

Selected measures that can be related to sufficiency:

-Improving service quality in public transportation (increased convenience, shorter travel time, better connections, intelligent passenger information systems)

-Increasing the availability of public transport in less densely populated areas

-Investment in new P+R and B+R parking facilities

-Integrated development of rail transportation in Budapest and large cities, better connecting suburban areas and city centres

-Promotion of active modes of mobility (biking, walking)

-new biking routes, new biking storage and parking places

Budapest Transport Development Strategy (Balázs Mór Plan 2014-2030)

Strategic objectives:

▷implementation of liveable public spaces,

▷integrated network development,

▷interoperable systems and intermodal connections,

▷environmentally friendly technologies,

▷comfortable, passenger friendly vehicles,

▷active and conscious awareness raising,

▷improved service quality

▷~60 measures covering all modes of transport and sub-sectors (walking, cycling, public and individual transport, parking, freight transportation, taxi services and IT-based developments)

Conclusions on Hungarian policies in the transport sector

- ▷Hungary focuses mainly on the electrification of transport and the use of alternative fuels
- ▷No target to decrease transport energy consumption
- ▷Some of the projected measures can help sufficiency

The development of the availability and service quality of public transportation

Improved infrastructure and traffic management helping bycicle use

Promotion of shared vehicle use

Promoting telecommuting

Municipalities: measures targeting the traffic reduction

Thank you for your attention

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www.rekk.hu

Lithuania

Relevance of sufficiency in the transport and building sectors

Dr. Viktorija Bobinaite

Relevance of Sufficiency in the Transport and Building Sectors in Lithuania with Regards to Existing Climate and Energy Strategies

by PhD Viktorija Bobinaite

9 October 2020

Introduction

Objective is to substantiate the significance of energy sufficiency in short- to long-run Lithuanian climate and energy policy related strategies.

Tasks:

- General Characteristics of Energy Sector;
- National Energy and Climate Policy Objectives and Targets;
- and Supporting Measures;
- Dimension of Energy Sufficiency within Energy and Climate Policy;
- First Insights on Energy Sufficiency Potentials in Buildings and Transport Sectors;
- Energy Sufficiency Support Measures in National Energy and Climate Action Plan for 2021-2030.

General Characteristics of Energy Sector

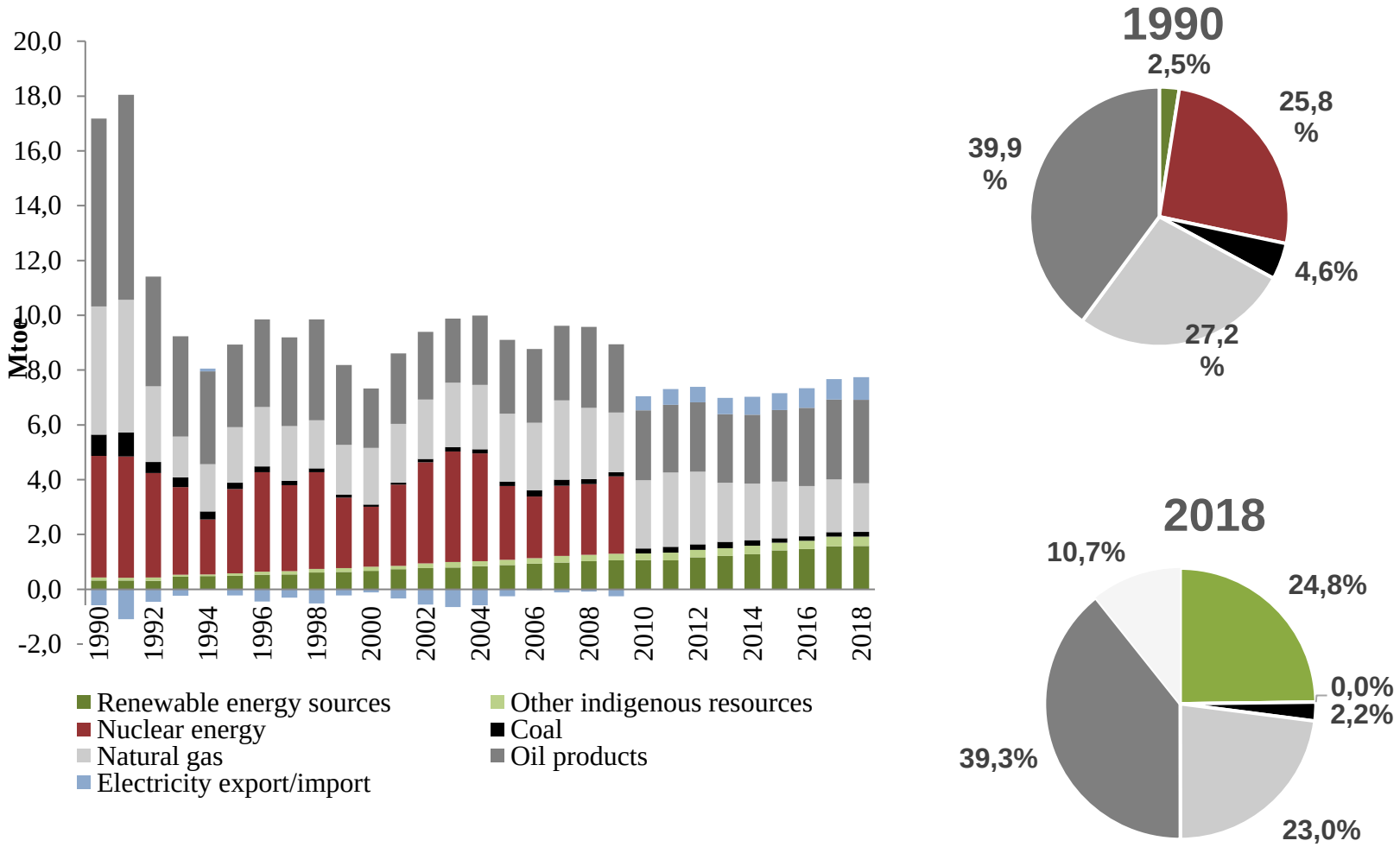


Fig. 1. Gross inland energy consumption and its structure by fuel type (Lithuanian Statistics)

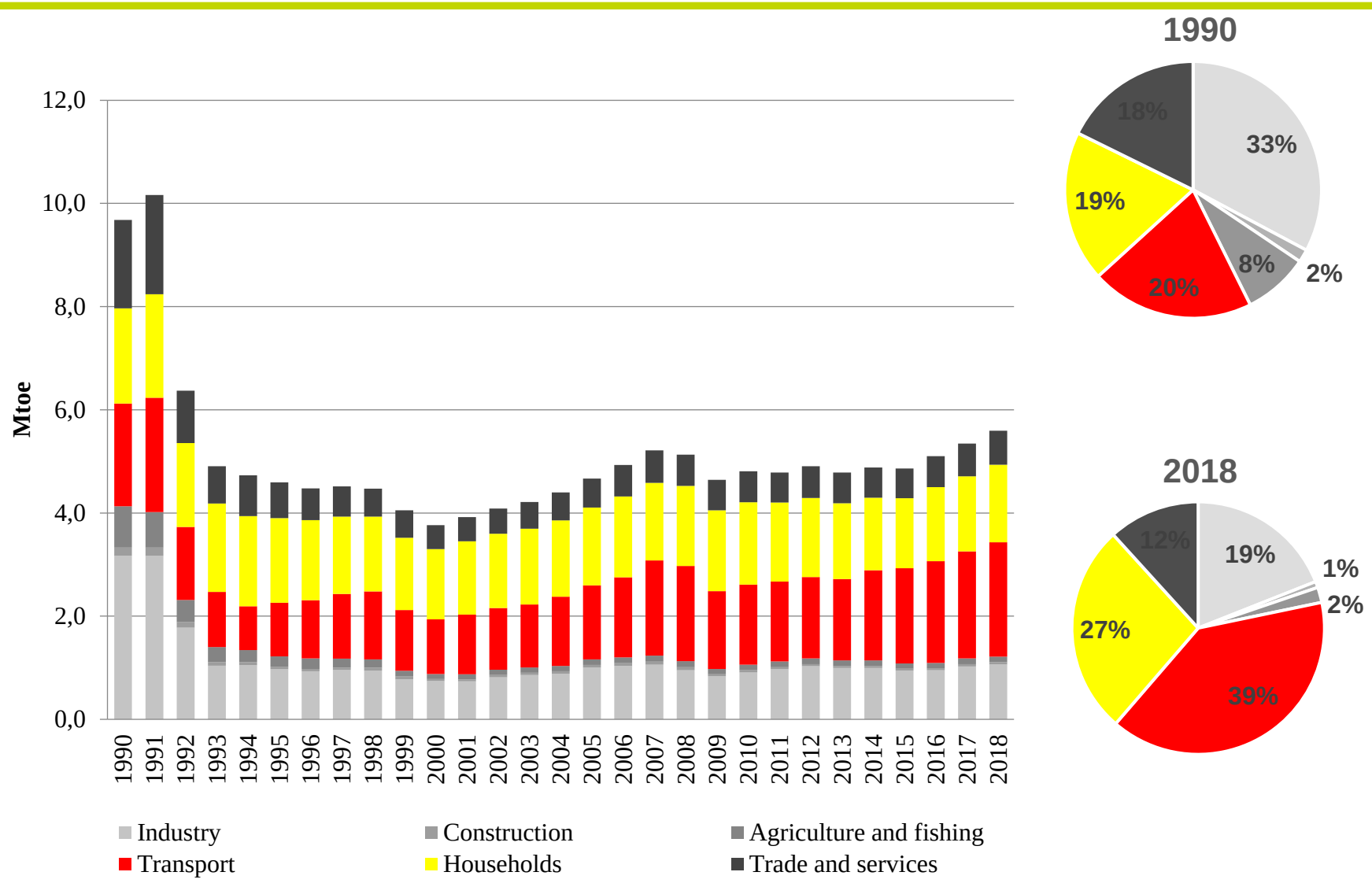


Fig. 2. Final fuel and energy consumption and its structure by sector (Lithuanian Statistics)

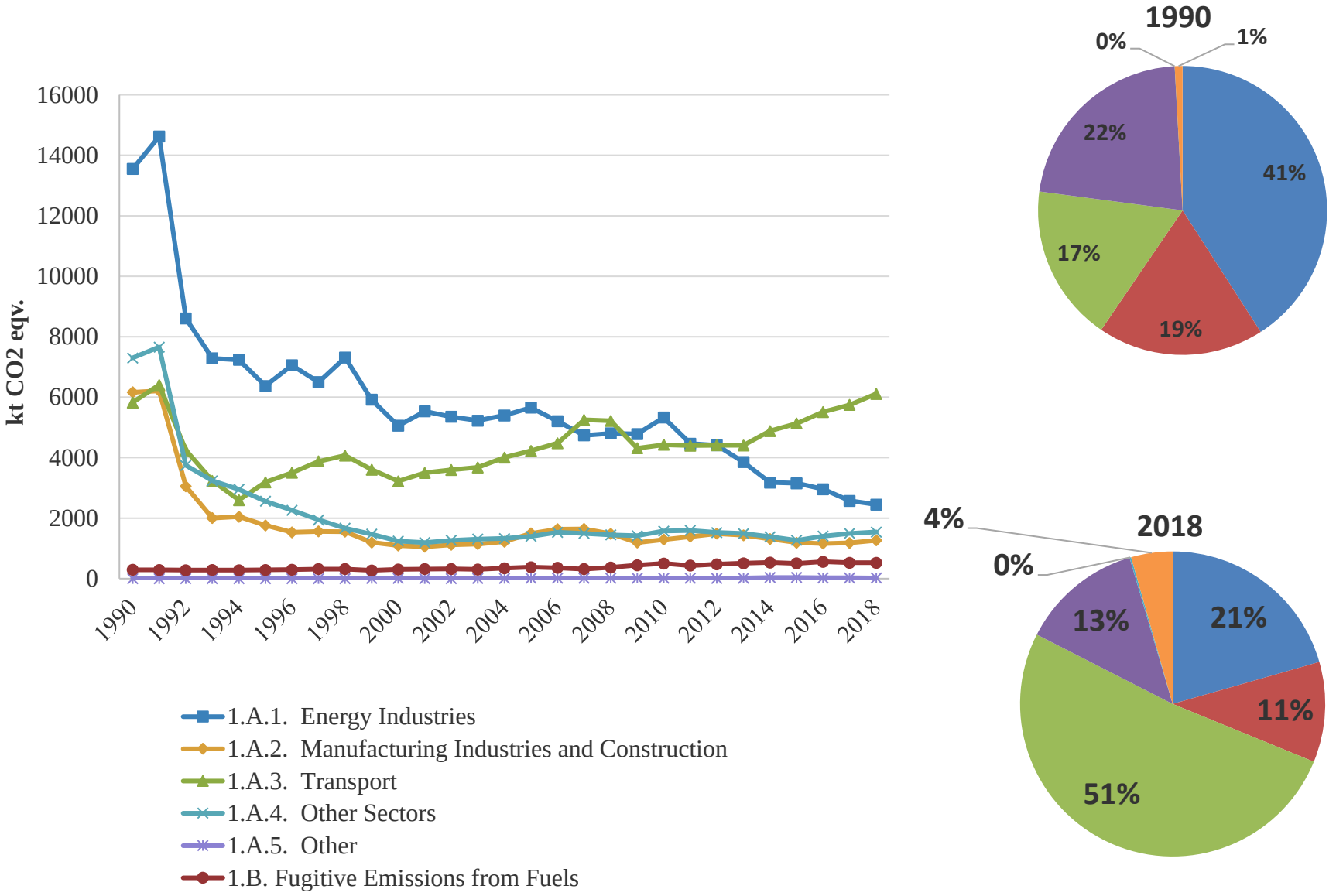


Fig. 3. GHG emissions in Lithuania (GHG Inventory Report)

Energy Consumption and GDP indexes

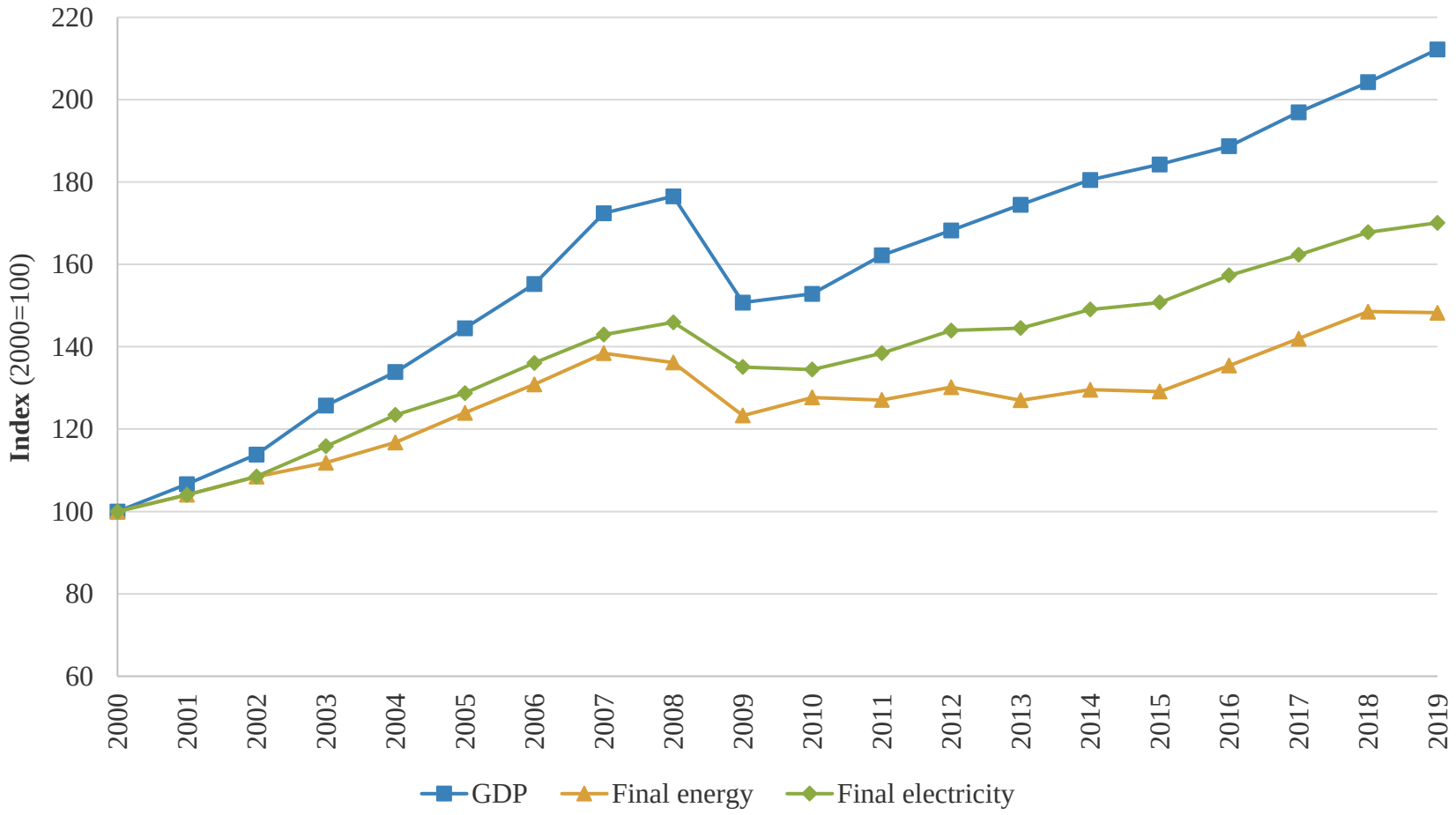


Fig. 4. GDP, final energy and final electricity consumption indexes (Lithuanian Statistics)

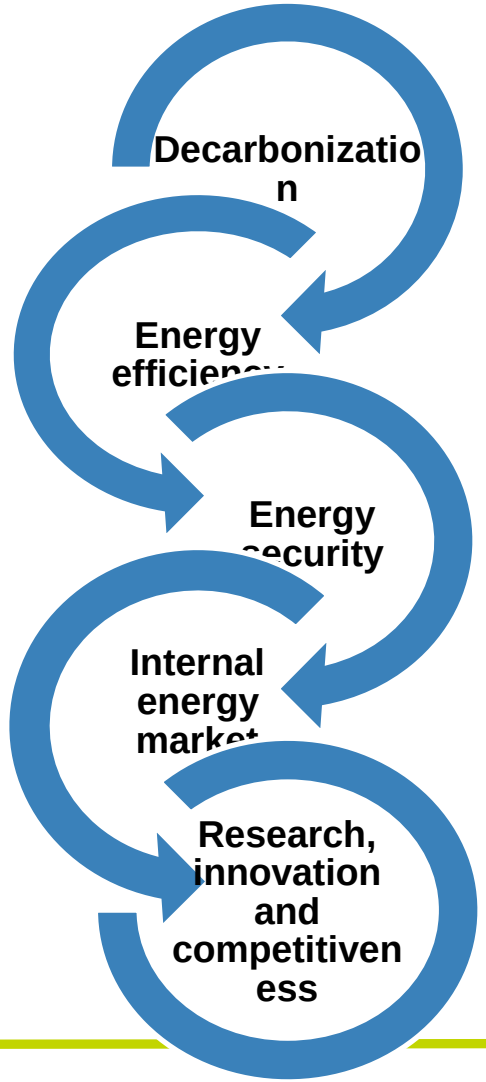
Energy and Climate Policy Objectives in **National Energy Independence Strategy**

2020 ENERGY-SECURE STATE	2030 COMPETITIVE ENERGY	2050 ENERGETICALLY SUSTAINABLE AND INDEPENDENT STATE
Objectives 1. Integration of the energy system in the EU energy system 2. Improvement of energy efficiency of energy consumption 3. Balanced and sustainable RES development 4. Optimisation and modernisation of energy infrastructure	**Objectives** 1. Energy price in the industry sector will be the lowest in the region (compared to other (Baltic, Scandinavian and Central and Eastern European countries); for citizens – a decreasing share of energy expenditure compared to average income 2. Smooth transition from fossil-based energy sources to RES	**Objectives** 1. 80% of the country's energy needs is generated from non-polluting (zero emissions of GHG and air pollutants) sources 2. 100% of local electricity production in the country's gross electricity consumption

Energy and Climate Policy Objectives in **National Energy and Climate Action Plan for 2021-2030**

- Promotion of integrated renovation of multi-apartment and public buildings;
- Rapid development of energy-efficient industries and deployment and purchase of environmentally friendly technologies and equipment.

- Achieved high level of electricity interconnectivity;
- Fostering integration of market;
- Reducing of energy poverty.



- GHG emission reductions;
- Development of RES in electricity, transport and heating/cooling

- Implementation of synchronization projects;
- Development of capacity mechanism;
- Ensuring of long-term continuity of Klaipėda LNG terminal;

- Creation of new forms of products and business.

EU and National Energy and Climate Policy Targets

Targets	EU		Lithuania	
	2020	2030	2020	2030
GHG emission target, %	20	40	EU level	
GHG emission target for EU-ETS, %	21	43	EU level	
GHG emission target for non EU-ETS, %	10	30	15	9
RES target, %	20	32	23	45
RES target for transport, %	10	14	10	15
Energy efficiency target, %	20	32.5	EU level	
Primary energy consumption, Mtoe	1474	1273	6.5	5.4
Final energy consumption, Mtoe	N/A	956	4.3	4.5
Final energy savings, TWh (EED, Article 7)			11.67	27

Energy Efficiency and Renewable Energy Support Measures for Achievement of Targets

EE & RES support measures for residential buildings

Normative support measures:

▷Energy performance of buildings. **Certification of Energy Performance**;

▷**Projection of Energy Performance in Buildings** from 2013 (STR 2.05.01:2013);

▷EU-related: **Revised Directive for Labelling of Energy-related Products** (Directive 2010/30/EU) - **Labelling of energy consumption-related products**;

▷Thermal Technique of Envelopes of the Buildings 2005-2013.

Financial support measures:

- European Union Structural Funds For 2014-2020 (**Modernization of Multifamily Buildings**);
- **Programme for the Renovation/Upgrading of Multifamily Buildings**;
- Special programme for climate change (**Energy Efficiency Improvement in the Household Sector**);
- Promotion of Modernization of Multifamily Houses (EU Structural funds for 2007–2013);
- Programme for Development of Problematic Areas in Municipalities during 2011-2013.

EE & RES support measures for transport sector

Normative support measures in transport sector:

▷Mandatory blending of biofuels into mineral fuels.

Financial support measures :

▷Renewal of urban and suburban public transport fleets by promoting vehicles running on alternative fuels and electricity;

▷Electrification of railways;

▷Implementation of sustainable urban mobility plans.

Fiscal support measures:

- Excise duty concession for biofuels.

Energy Sufficiency Within Energy and Climate Policy

▷Energy sufficiency **is not well addressed** within energy and climate policy and **sufficiency concept is not necessarily related to sustainable consumption**. Some observations on sufficiency are:

Since the start of operation of the Klaipėda Liquefied Natural Gas (LNG) terminal in 2014, sources of supply have diversified and Lithuania is able to obtain **sufficient natural gas from international LNG markets**;

Lithuania has the only oil refinery in the Baltic States and therefore **imports of crude oil are more than sufficient for Lithuania's needs**. The country has **accumulated sufficient State stocks of petroleum products** to protect against petroleum product supply disruptions.

▷Instead, energy and climate policy is **oriented towards reduction and alleviation of insuffiencies** in:

electricity production capacities and grid capacities to meet the electricity needs of consumers for the purpose to ensure effective competition in electricity sector while minimizing the burden on electricity consumers;

GHG reductions in individual sectors. Insufficiencies may be caused by new technologies that are too costly or underdeveloped, and by insufficient practical applications;

transport infrastructure connections with other EU States and third-country transport networks.

There is a **hidden energy poverty**, where households may spend too little and not acquire sufficient services, including energy services.

Population Living in Under-Occupied Dwellings

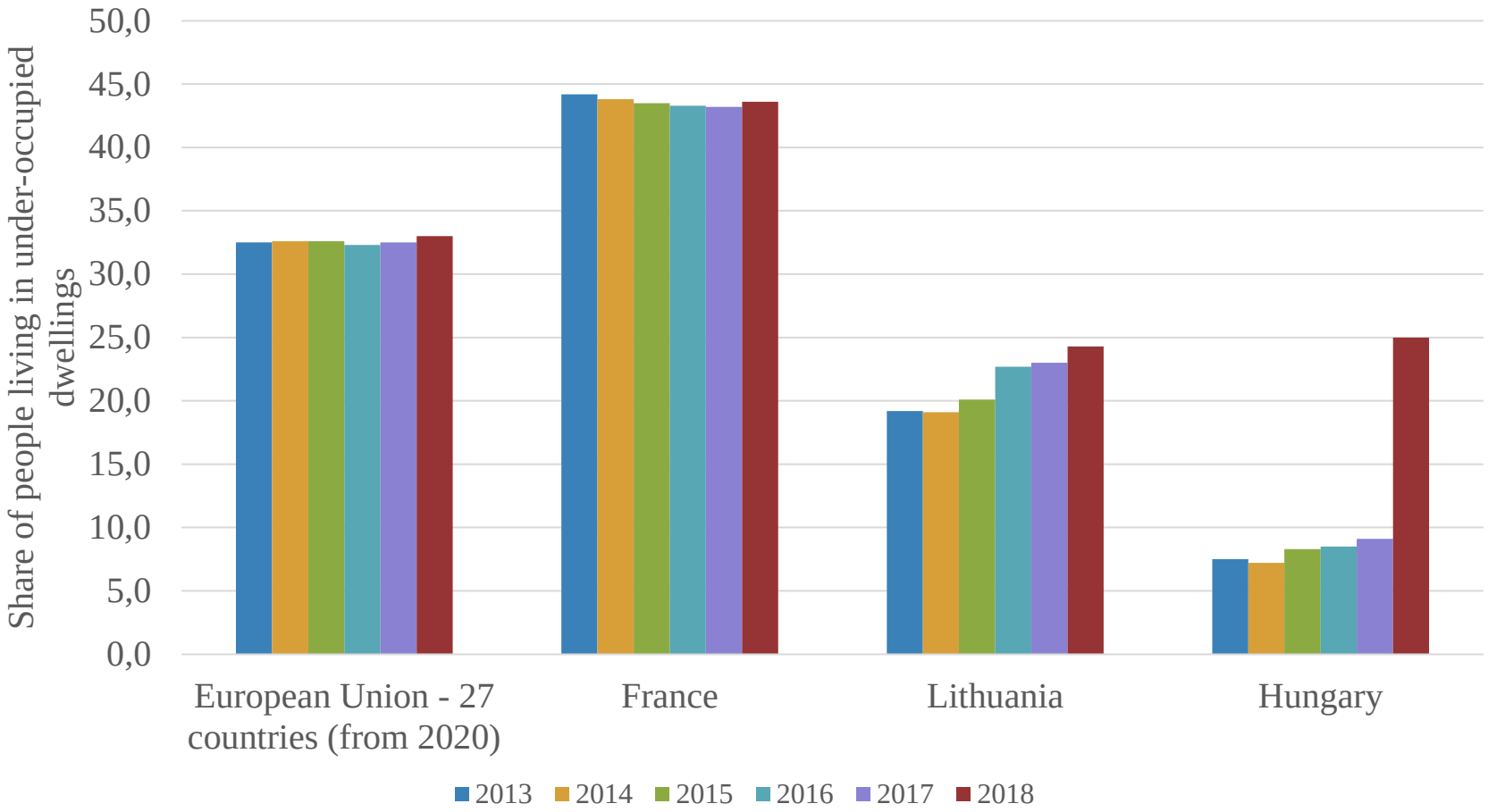


Fig. 5. Share of people living in under-occupied dwellings (Eurostat)

Population Living in Overcrowded Dwellings

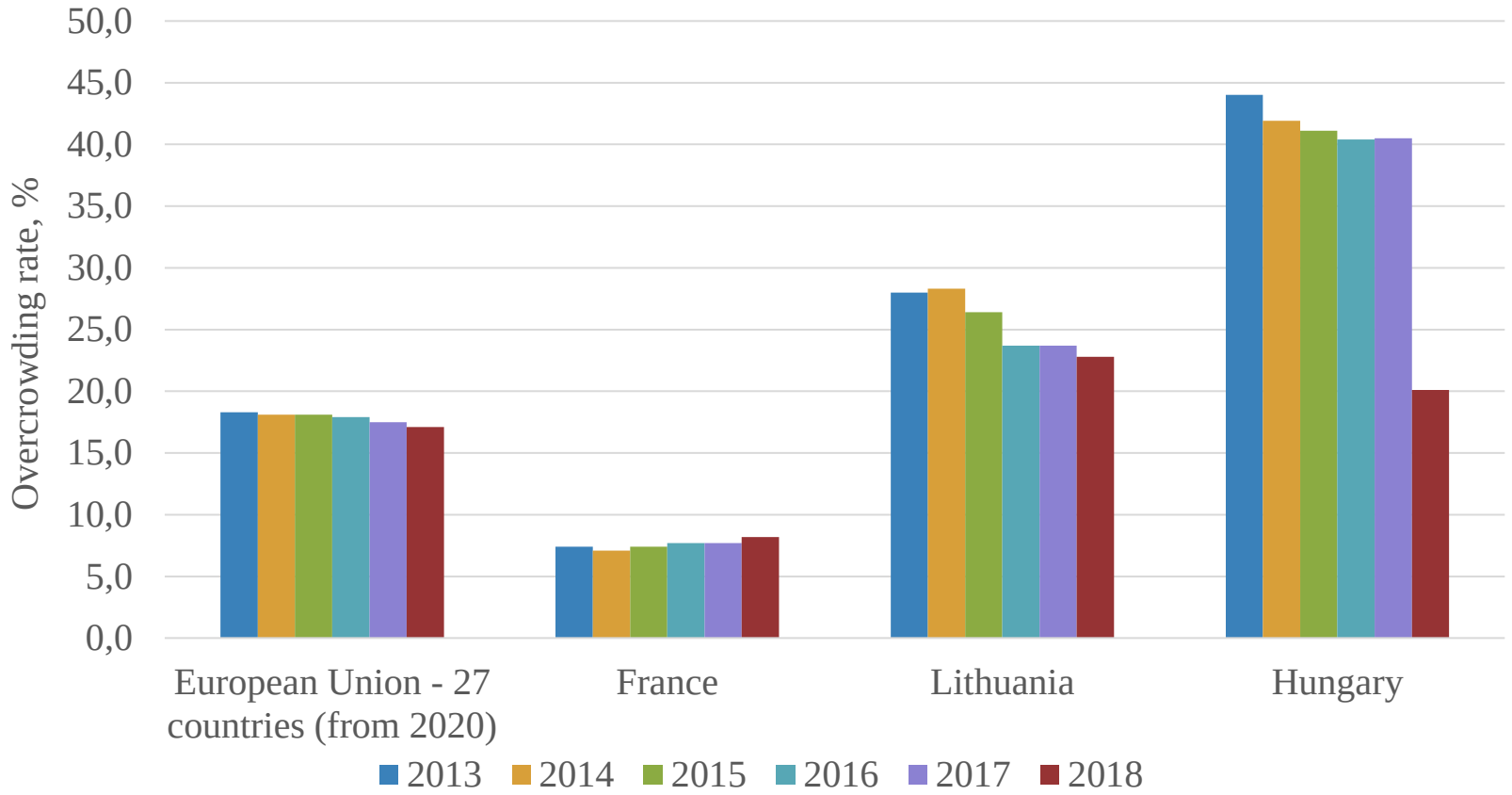


Fig. 6. Overcrowding rate, % (Eurostat)

First Insights on Energy Sufficiency Potentials in Buildings

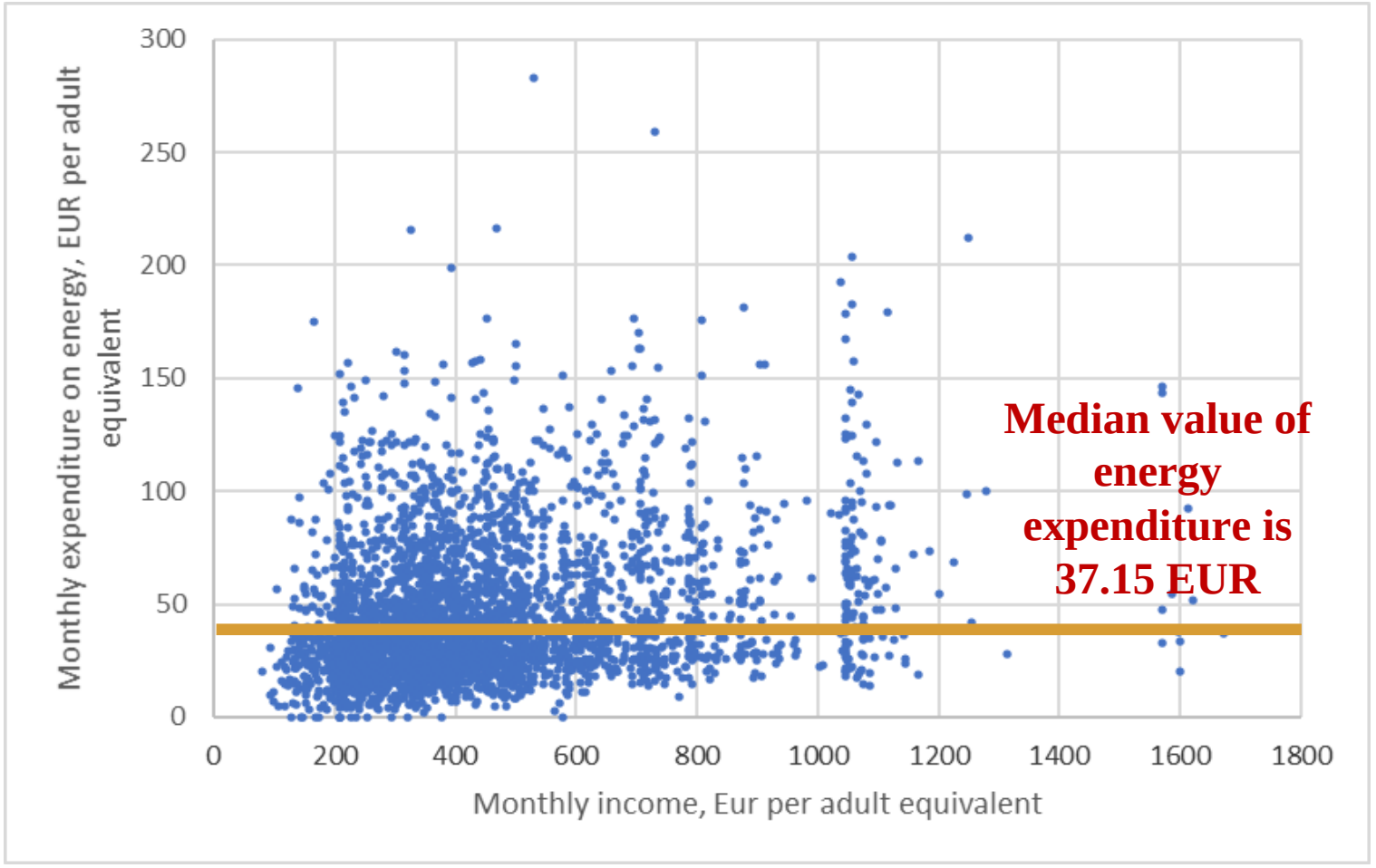


Fig. 7. Relationship between income and energy expenses of households in Lithuania in 2016

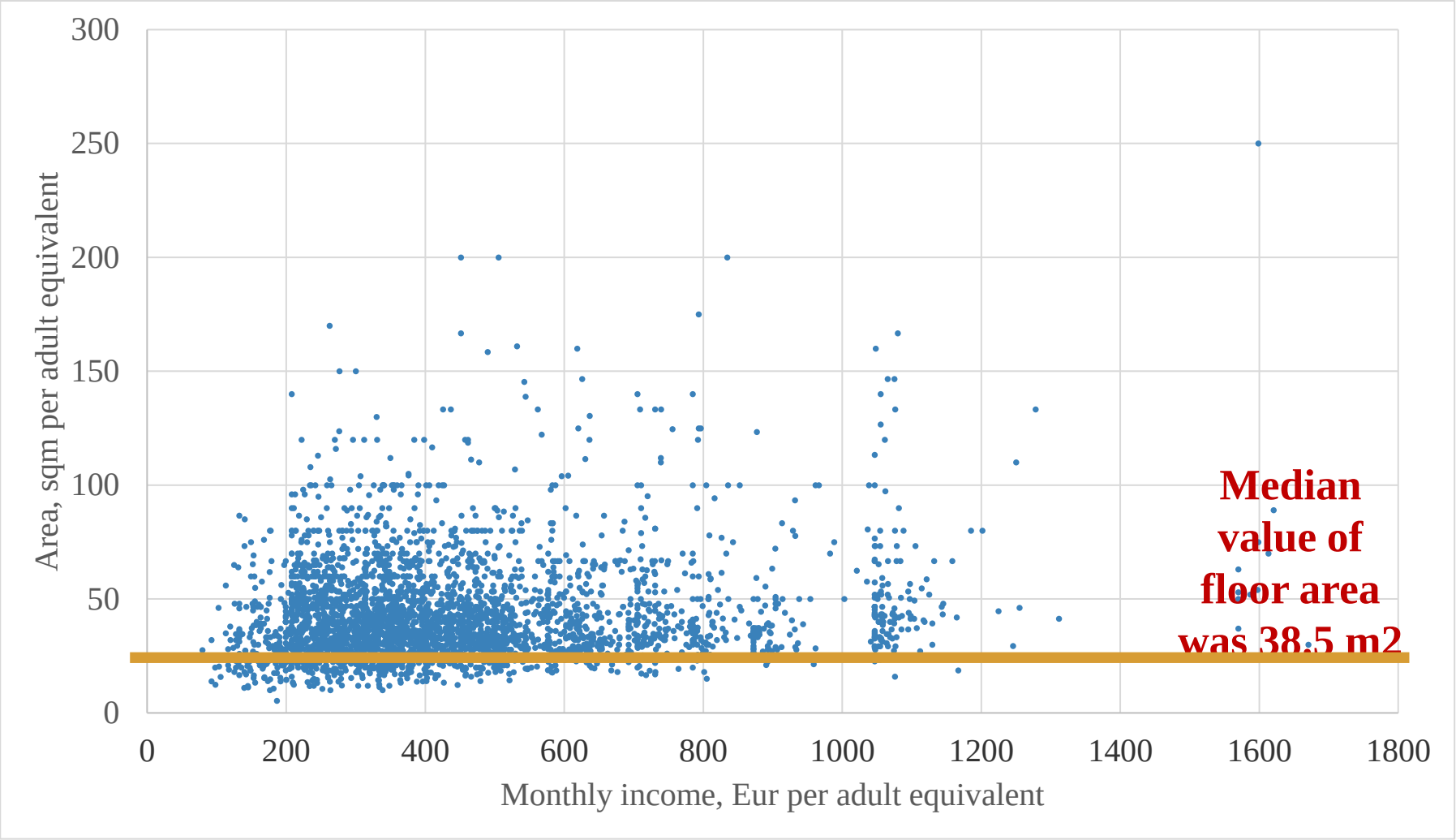


Fig. 8. Relationship between energy expenses and floor area in Lithuania in 2016

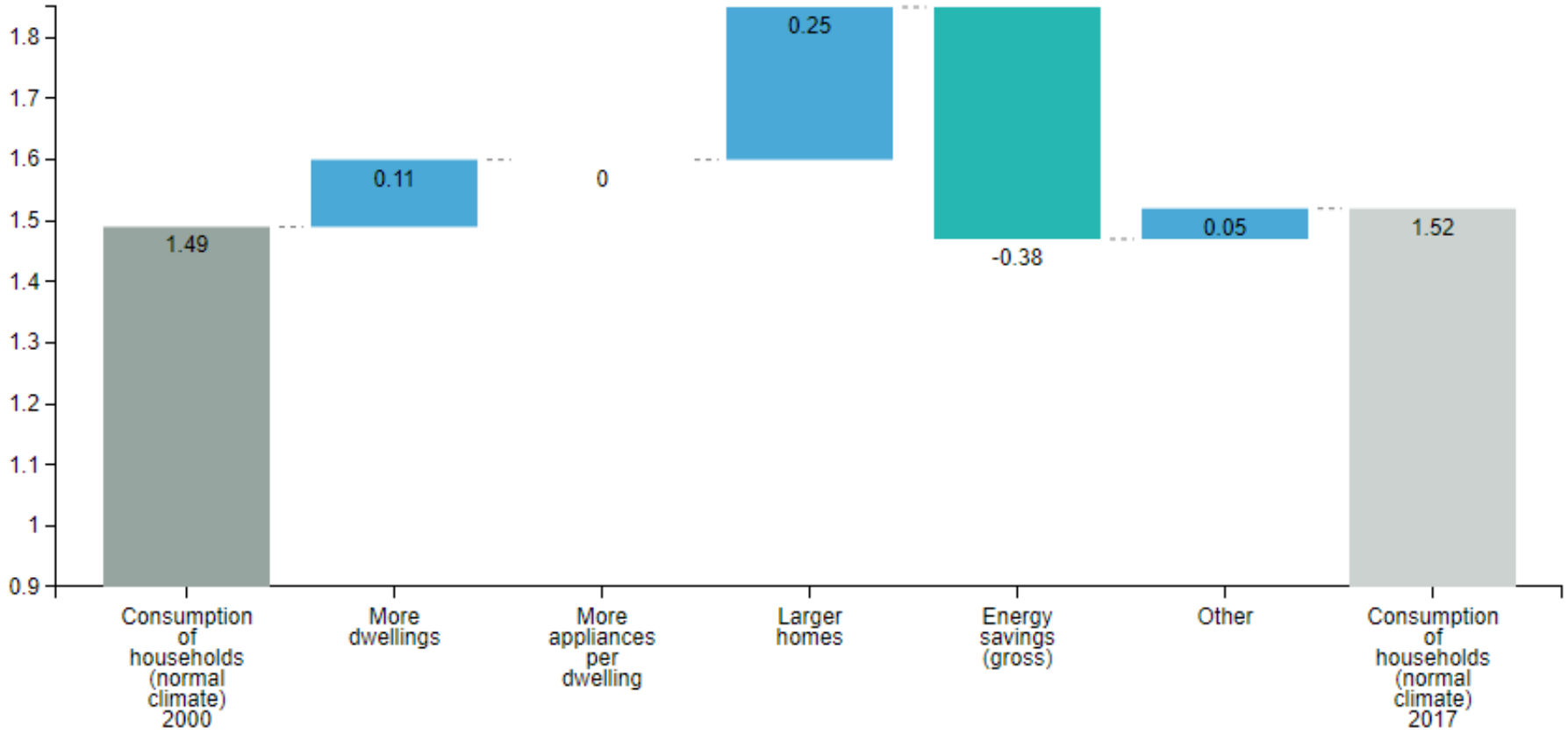


Fig. 9. Variation in household consumption, Mtoe
(ODYSSEE-MURE database)

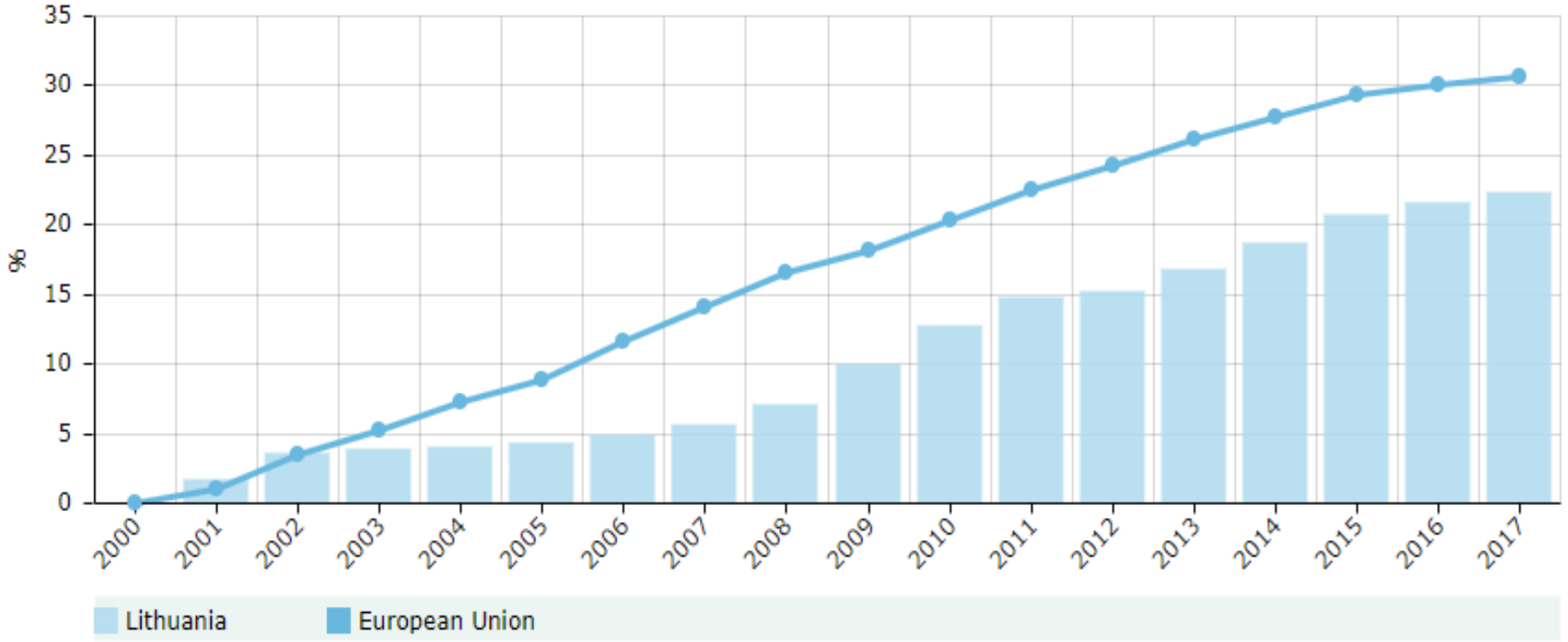


Fig. 10. Energy saving rate in households in Lithuania and EU since 2000 (ODYSSEE-MURE database)

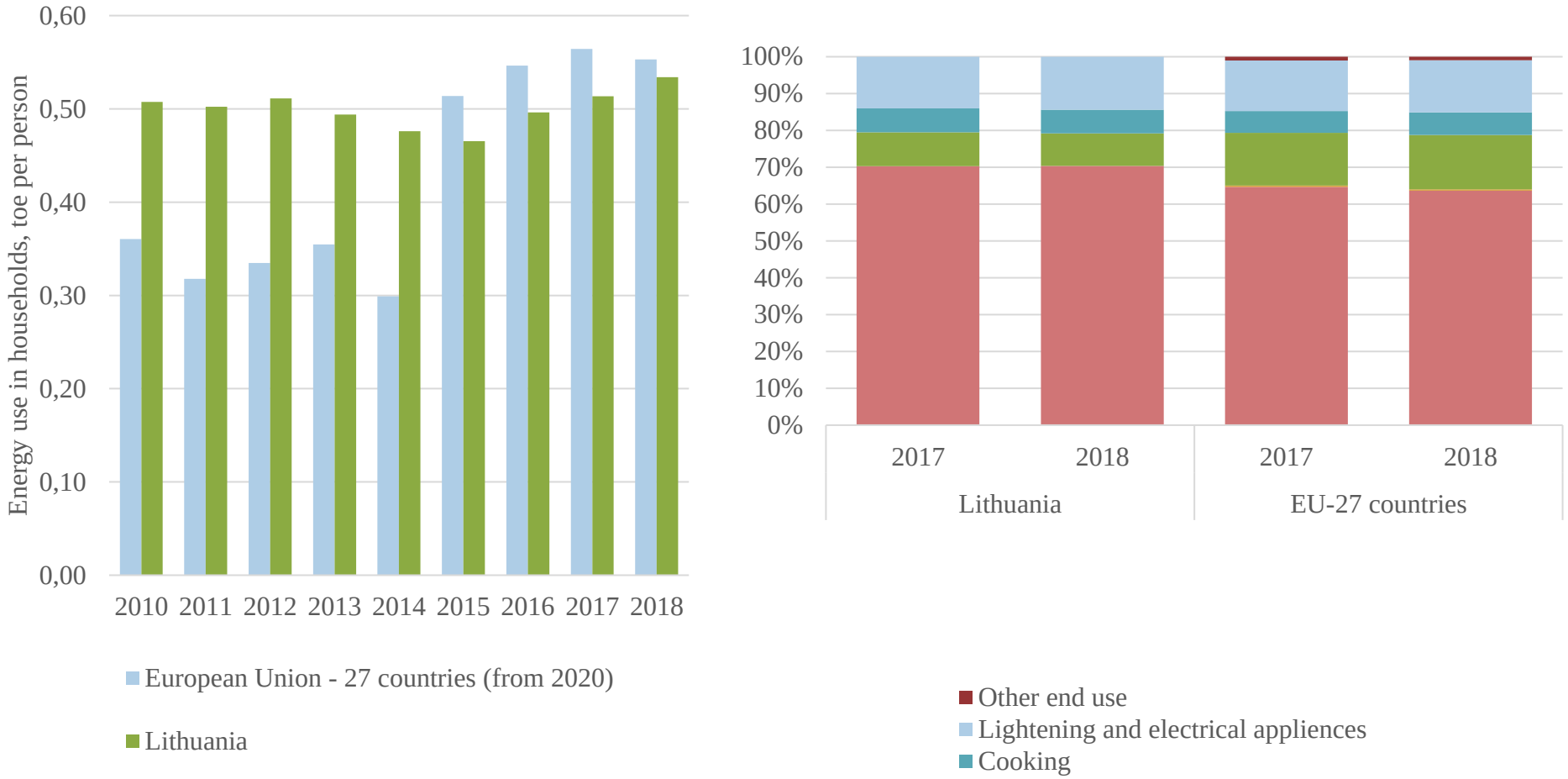


Fig.11. Final energy consumption in households by its purpose in Lithuania and EU-27 (Eurostat)

First Insights on Energy Sufficiency Potentials in Transport

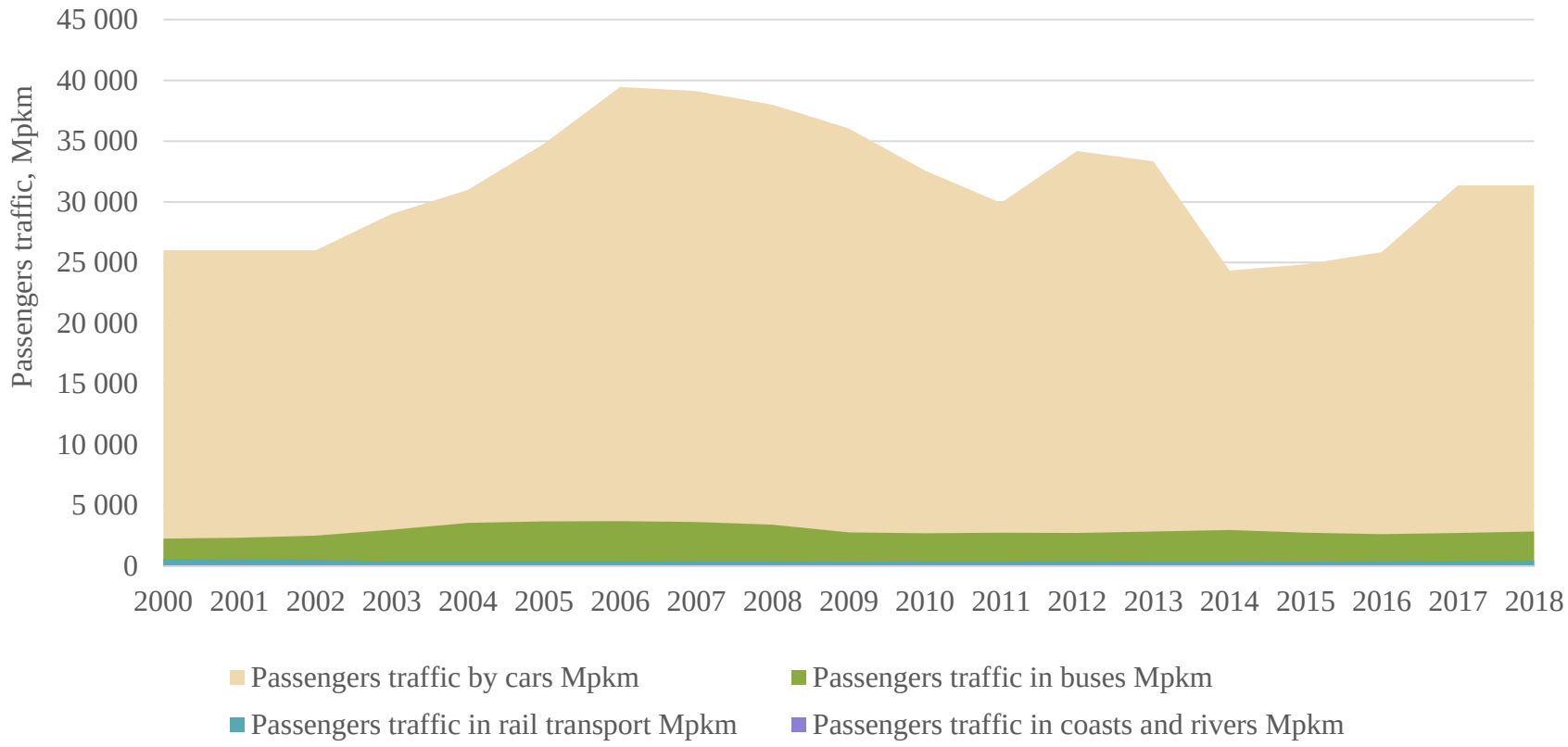


Fig. 12. Passengers traffic in Lithuania since 2000
(ODYSSEE-MURE database)

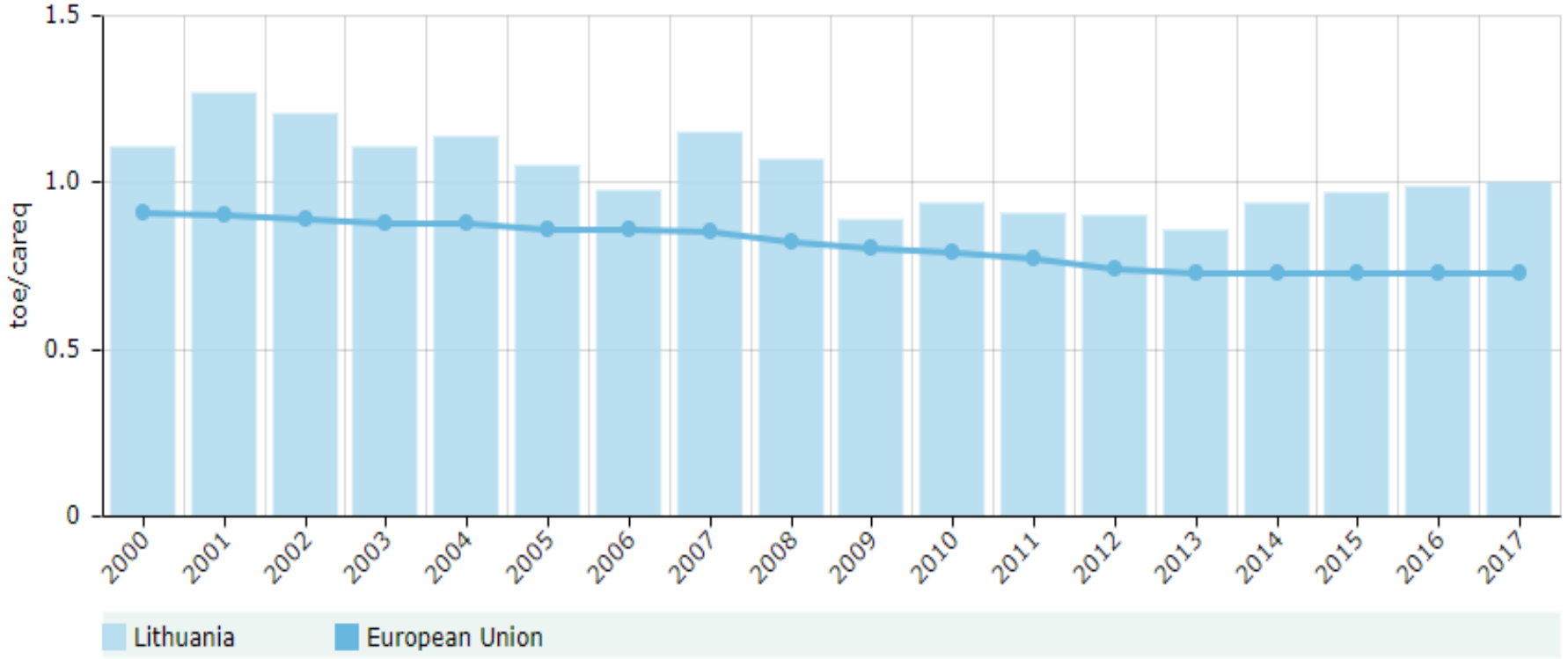


Fig.13. Energy consumption of road transport per equivalent car since 2000 in Lithuania and EU

(ODYSSEE-MURE database)

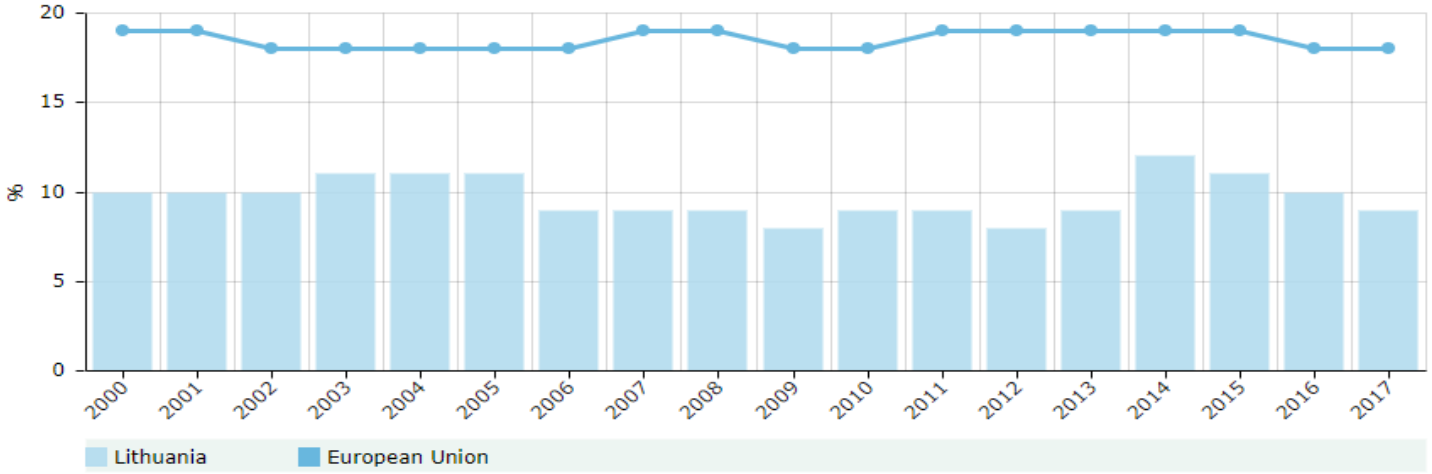


Fig. 10. Share of public transport in total land passenger transport, %
(ODYSSEE-MURE database)

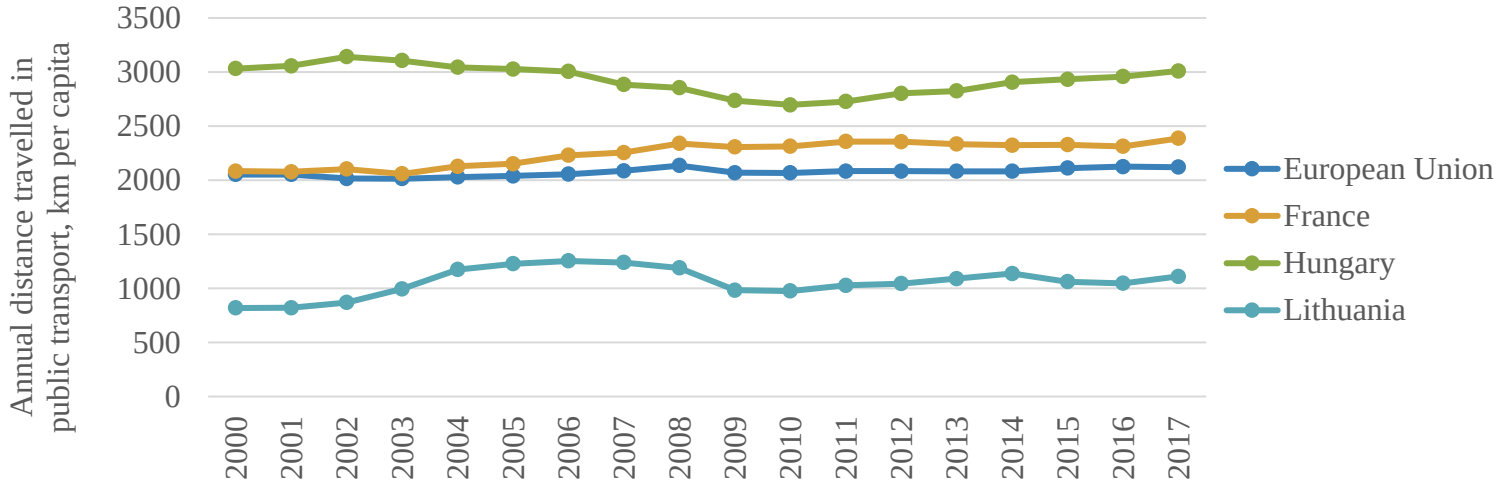
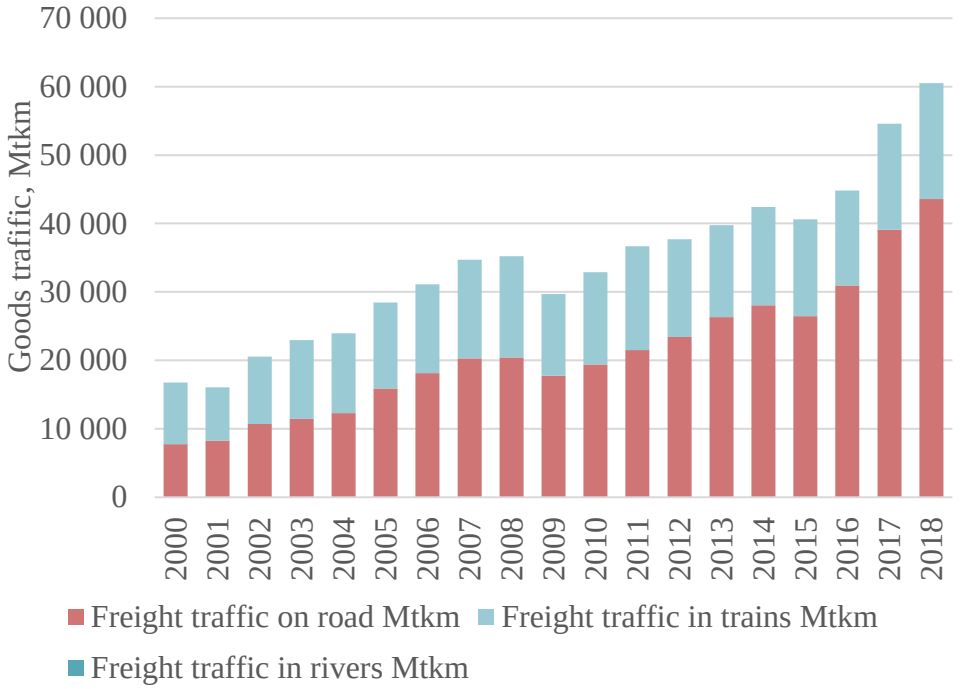


Fig. 14. Annual distance travelled in public transport, km per capita
(ODYSSEE-MURE database)



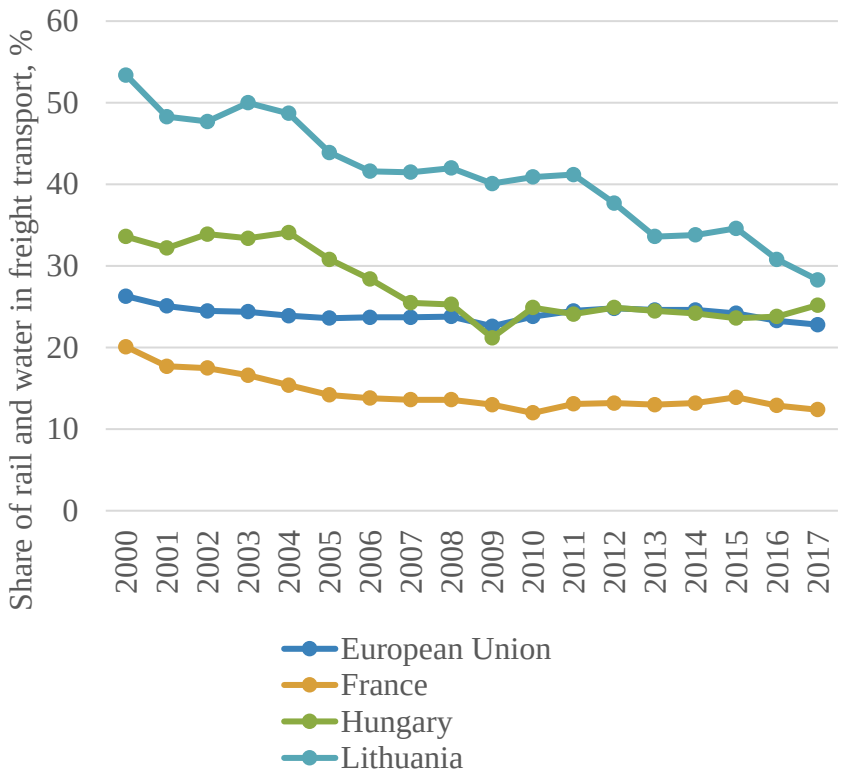


Fig.15. Goods traffic in Lithuania since 2000
(ODYSSEE-MURE database)

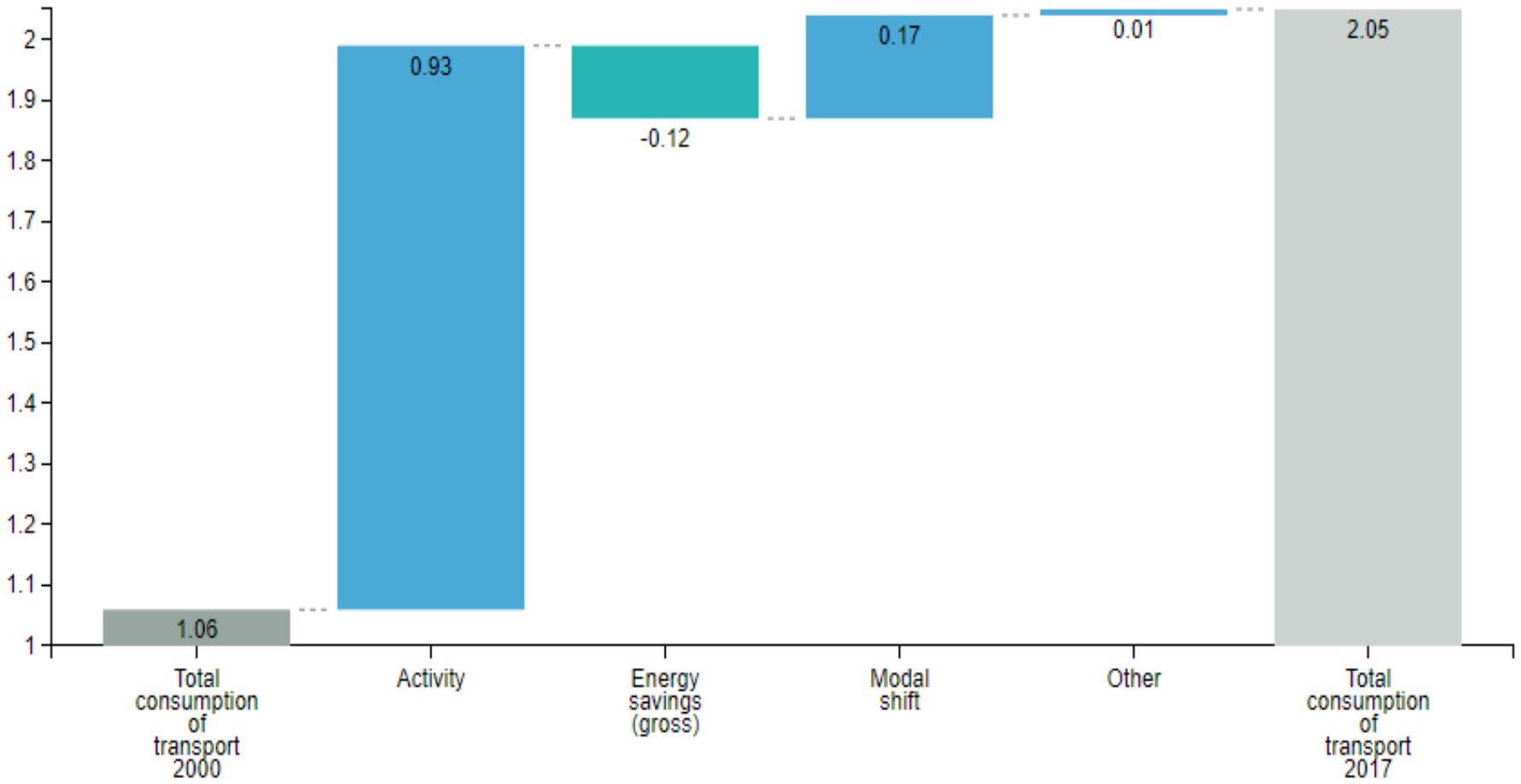


Fig. 16. Variation in transport consumption, Mtoe
(ODYSSEE-MURE database)

Energy Sufficiency Within Energy and Climate Action Plan for 2021-2030

Decarbonization measures

▷Developing and promoting economic and ecological driving skills;

▷Establishment and implementation of a system of tax incentives for inland waterway transport;

▷Promoting flexible working hours and remote work;

▷Broad social dissemination, public information, habit building and pilot projects to reduce fossil fuel consumption;

▷Improving access to and use of public transport;

▷Development and implementation of a cross-cutting study on public transport in Vilnius city;

▷Promotion of zero emission taxi and ridesharing service providers.

Energy consumption reduction measures

▷Impact of higher excise duties and taxes on fuel (petrol, LPG, diesel) consumption;

▷Agreements with energy suppliers on consumer education and consulting.

Horizontal measures

- ▷Integration of climate change into all programs in the education system;
- ▷Increasing public awareness and involvement in the climate change management policy;
- ▷Promoting research on climate change mitigation and adaptation.

Thank you for the attention

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Tea and Coffee break

Bridging the sufficiency gap:

An introductory technical dialogue

Discussion on bridging the sufficiency gap

Conclusions and next steps

Thank you!