CACTUS

STRENGTHENING CENTRAL AND EASTERN EUROPEAN CLIMATE TARGETS THROUGH ENERGY SUFFICIENCY

Sufficiency assumptions workshop

Online, 21 May 2021

Supported by:

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

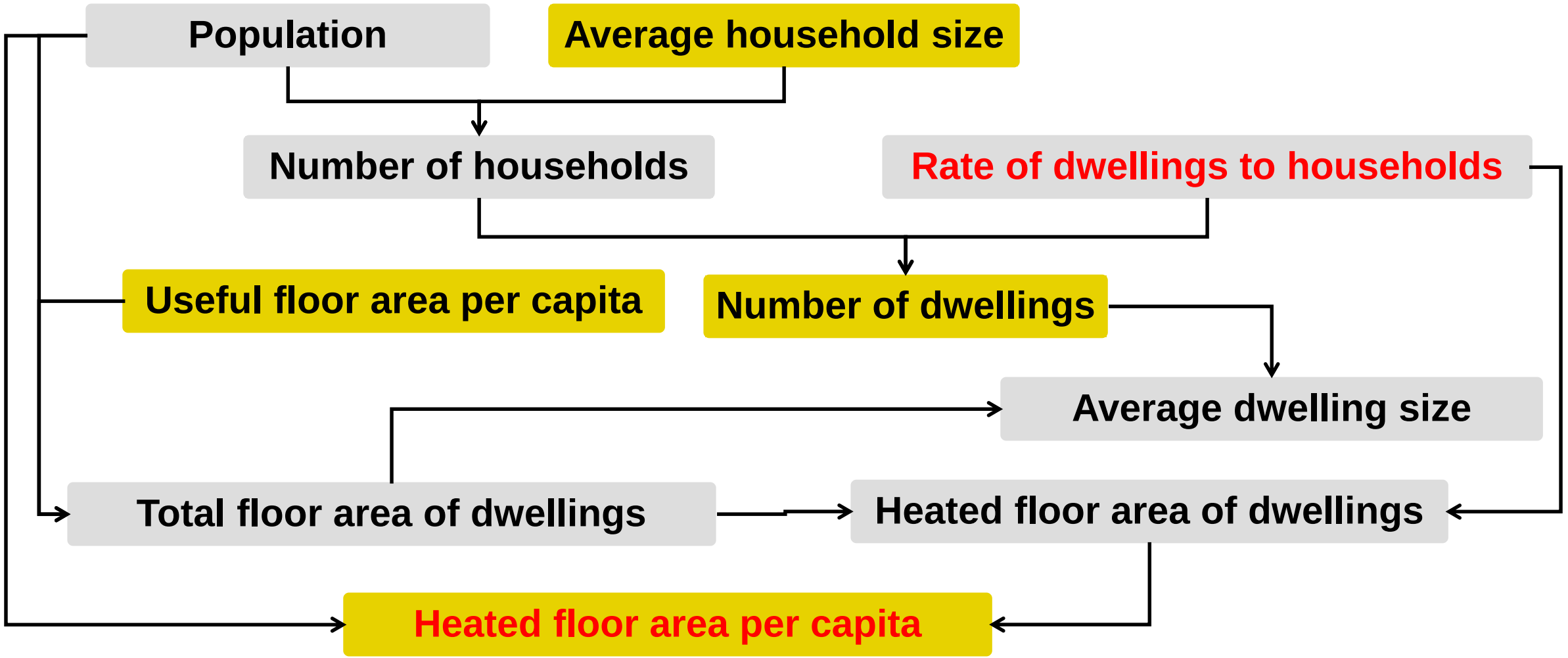
European Climate Initiative EUKI

based on a decision of the German Bundestag

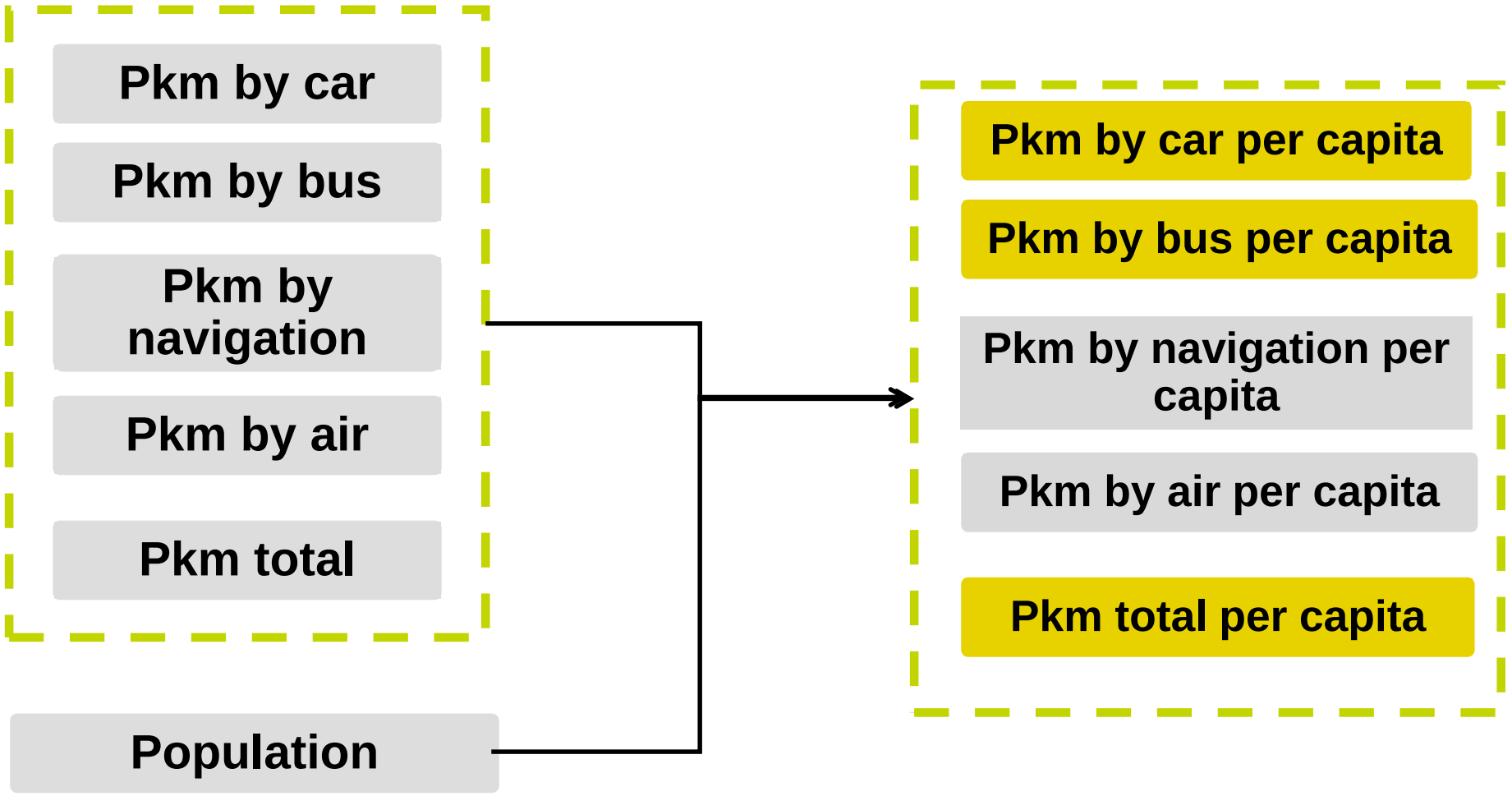
Introduction

First approach and questions towards building assumptions in LT

- **Time series analysis** with the aim to find out the trend of selected indicators;
- **Literature review** with the aim to identify key factors of the developments of selected indicators;
- **Policy and projects' review** with the purpose to clarify possible developments of the selected indicators;
- **Regression analysis and coefficient of determination** to disclose and visualize possible developments of selected indicators to 2050;
- **Discussions** with colleagues on established trends up to 2050, their reasonability as well as motivation for this trend
- **Comparison** of estimations of indicators with proposed within the CACTUS project.



Sequential steps towards estimation of indicators for the building sector up to 2050



Sequential steps towards estimation of indicators for the transport sector up to 2050

First approach and questions towards building assumptions in HU

REKK First approach to assumptions – general notes

- In HU, some buildings and transport indicators look better than the EU average or the potentials received from the literature.
- We can keep the present rates or lower/increase them with consideration to
    - trends in some influencing factors,(e.g. continuously decreasing population)
    - values in other countries, EU average
    - theoretical potential found in literature
- Than we can look at the possible savings in the 2030/2050 time horizon compared to outcomes without dedicated policies (BAU)

- The BAU is provided by the demand trajectories incorporated in the Hungarian Times model (projections from econometric analysis and trajectories included in policy documents)
- We need to have feasible policy options before making assumptions on sufficiency potential in relation to the indicators.

- Shall we try to model the effect of all indicators/variables? Some of them might result in much lower GHG savings than others.

REKK First approach to assumptions – issues related to buildings

- Average per capita floor area in Hungary is close to the theoretical potential (small compared to EU or Western countries)
- How to moderate the impact of expected raise in income and well-being on the Hungarians' behaviour and consumption profiles (e.g. how to avoid reaching the same level)
- Two factors influence the main sufficiency indicators, the change in building stock (floor area) and the change in population
    - measures targeting sufficiency improvements hardly influence trends in the population so we must focus on how to reorganize people into a different dwelling structure
        - if we regroup families from overcrowded to underoccupied dwellings then well being improves but energy consumption does not necessarily decrease
    - How can average per capita dwelling size be influenced – through newly built buildings ?
        - What kind of changes should we incentivize in the case of newly built dwellings – can we presume the average size of flats to be lower?
        - How would energy consumption levels change as a result? (Newly built dwellings have to meet the nearly zero energy buildings criteria)
        - Can we reclassify flats or buildings with disadvantaged energy consumption properties into other functions which require less energy usage (e.g. less heating)?

REKK First approach to assumptions – issues related to buildings

- Non-household buildings
  - Office buildings can be more efficiently built than some dwellings – less use of energy in office buildings- smaller offices
  - Do we expect a smaller demand for public buildings or shops as online administration and online shopping become more and more popular? This can lead to a decrease in the total floor area in the not too distant future

- What can be shared?
  - Lighting and electric devices account for 10% of total energy consumption of households. Sharing of devices can save energy – it is a question whether culturally can work?
  - Functions of dwellings: rooms, playground, playing room, TV room
  - Sharing rented dwellings having common kitchen and bathroom for single persons, students, older people, etc.
  - more people per household/dwelling – presuming a share of single person households moving together
  - In newly built houses – possibility of merging functions into common rooms/areas – washing machine, ironing room, bicycle storage, similar to sharing of rooms

REKK First approach to assumptions – issues related to transport

We find it difficult to influence the No. of persons per car by policies – would it be a better way to direct travelers

- to public transportation/active modes in densely populated areas and
- to car sharing in less densely populated areas as a mode for last mile services (Booking through app, perhaps allowing also pooling (~price))?

- Car use (km/car/year) – besides the policy options collected in II.3, an additional policy suggestion is imposing road tolls and/or congestion charge within cities and other densely populated areas, and increase parking fees much more (COVID – free parking – effects?)
- No. of cars per person
  - How can we take into account future developments and trends? (Car sharing, electrification, ICT, autonomous vehicles)

REKK First approach to assumptions – issues related to transport

- Rate of private car ownership - the problem of manager cars
    - provided as part of compensation package by companies - this form is not energy-saving but can be rather wasteful (large, high consumption vehicles and unlimited personal use with free fuel provided) - the policies of companies should be challenged
    - can we distinguish these non-private cars from shared cars within companies and car-sharing services which lead to more sufficient use?
- Pkm by rail
    - potentials are highly influenced by infrastructure development (urban and interurban) – are there reliable data on those?
    - same problem with bike infrastructure
- Navigation and aviation
    - what shall we do with the problem of inconsistency of travel demand with GHG emission inventories? (Will be presented later..)

Comments and reaction by nW and FhISI

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: *(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

Adapting to various situations

❑ **Global approach:**

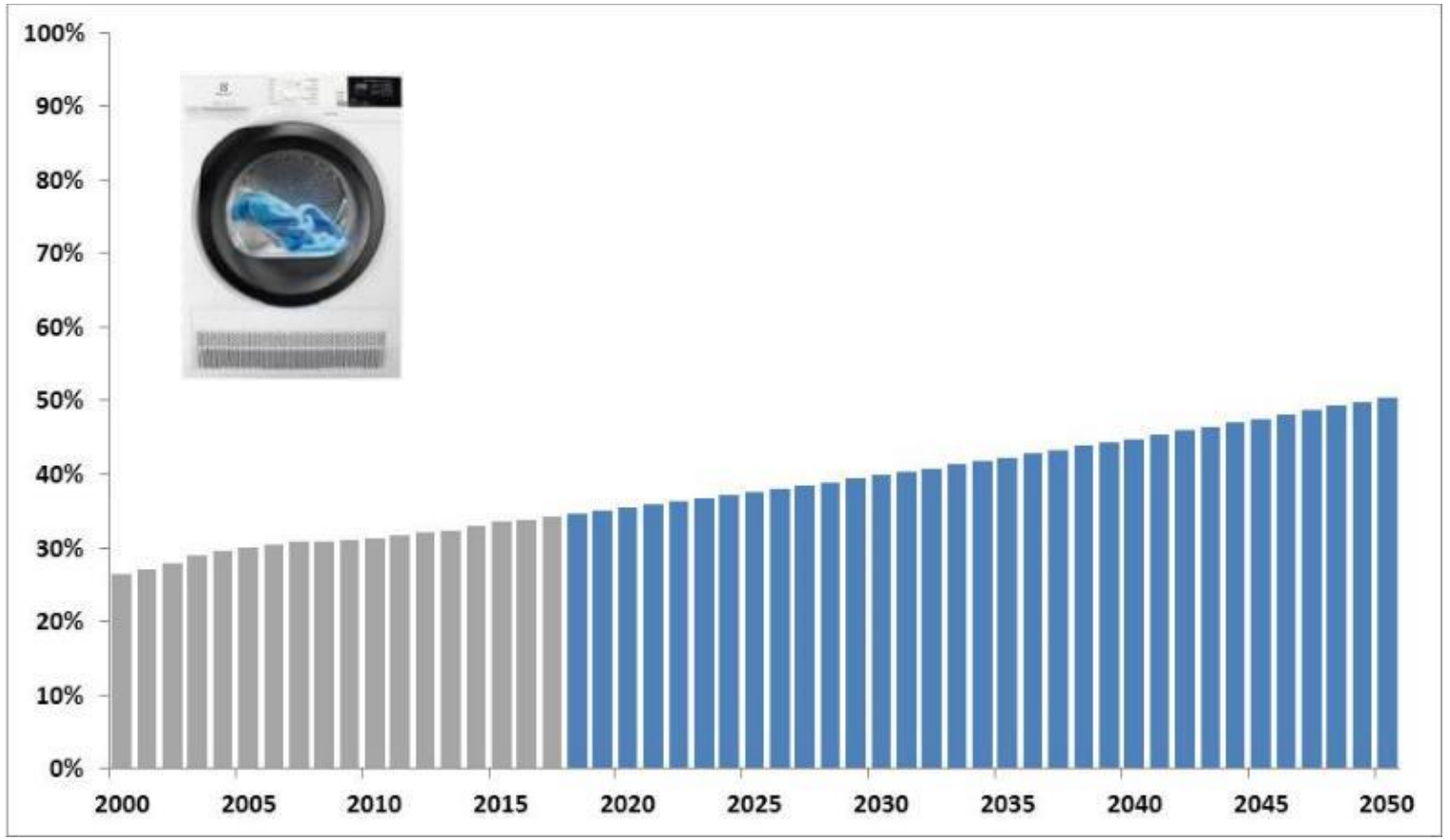
- Characterizing the existing level of service through identified relevant indicators
- Developing quantitative and qualitative reasoning to project the evolution of this level of service
- Using available material to assess and justify the possible range of sufficiency

❑ **Depending on items, need to adapt:**

- *Trend is not always easy to define, but it is not absolutely needed to build a sufficiency trajectory*
- *Level of available literature to be used is very different depending on uses, countries, etc.*
- *Normative concerns can be introduced when quantified limits can be referred to*
- *Etc.*

Step #1: Looking at past trends and deriving a business-as-usual scenario

- Example: **ownership rate of tumble driers** in French dwellings



Step #2: Estimating a plausible sufficiency target

- **Discussing how needed vs extravagant** the service would be in a more 'sufficient' society (taking into account its energy / material impact and the existence of sufficiency alternatives)

  e.g. line drying, collective driers, shared driers

- **Framing the limits to sufficiency assumptions** by analysing potential physical/technical limits, social limits, political limits

  e.g. households where avoiding a drier would be very difficult (disabled people, old people, very big families…) ~ 15% of the population?

- Considering possible **precautions** regarding social justice, gender equality and inclusiveness

- Using as much as possible results from research and literature
  - Analysis of drier ownership according to household type, size, age, etc.
  - Survey on user behaviour and preferences

German study "Acceptability of sufficiency practices in households" (Wuppertal Institute, 2016)

Step #3: Setting a credible trajectory

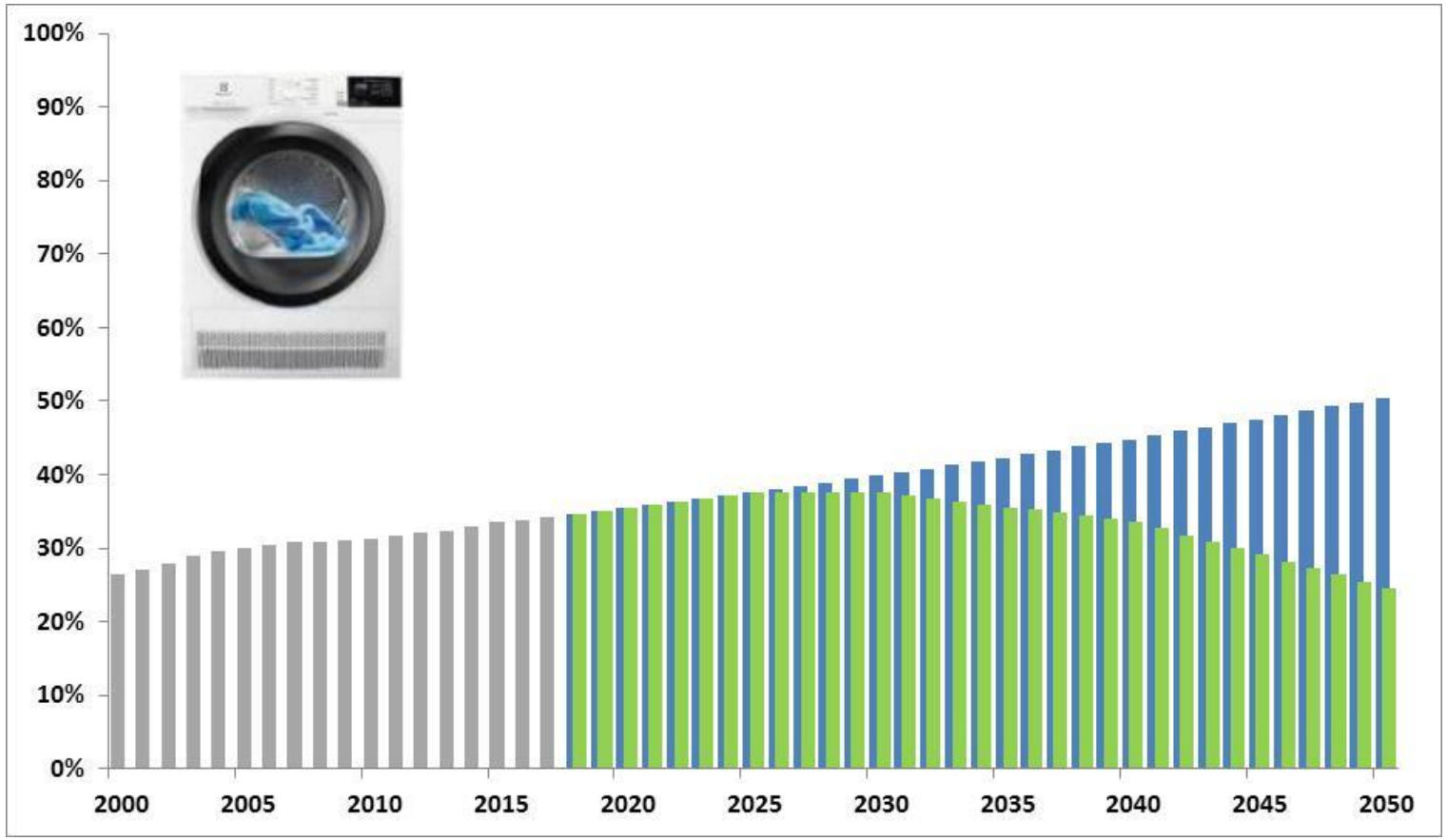
- **Estimating the pace of change** between 2020 and 2050
- **Estimating** how quickly and effectively social practices, technologies, infrastructures, supporting policies & measures could influence that pace

  - Example of driers

Evolution	Impact
Communication campaigns to raise awareness and change habits	+ / short-term
ICT tools to facilitate shared/collective practices (e.g. drier sharing)	+ / short-term
Financial schemes to alter consumer behaviours (e.g. bonus/malus schemes)	++ / short-term
Educational change for new social norms in laundry	++ / long-term
Educational change for new social norms in fashion (less clothes => less drying needs)	++ / long-term
Changes in building conception (more space for line drying and collective laundry)	++ / long-term
New washing technologies (e.g. ultrasound washers - no water!)	+++ / long-term

Step #4: Getting to a projected assumption

- Example: **ownership rate of tumble driers** in French dwellings



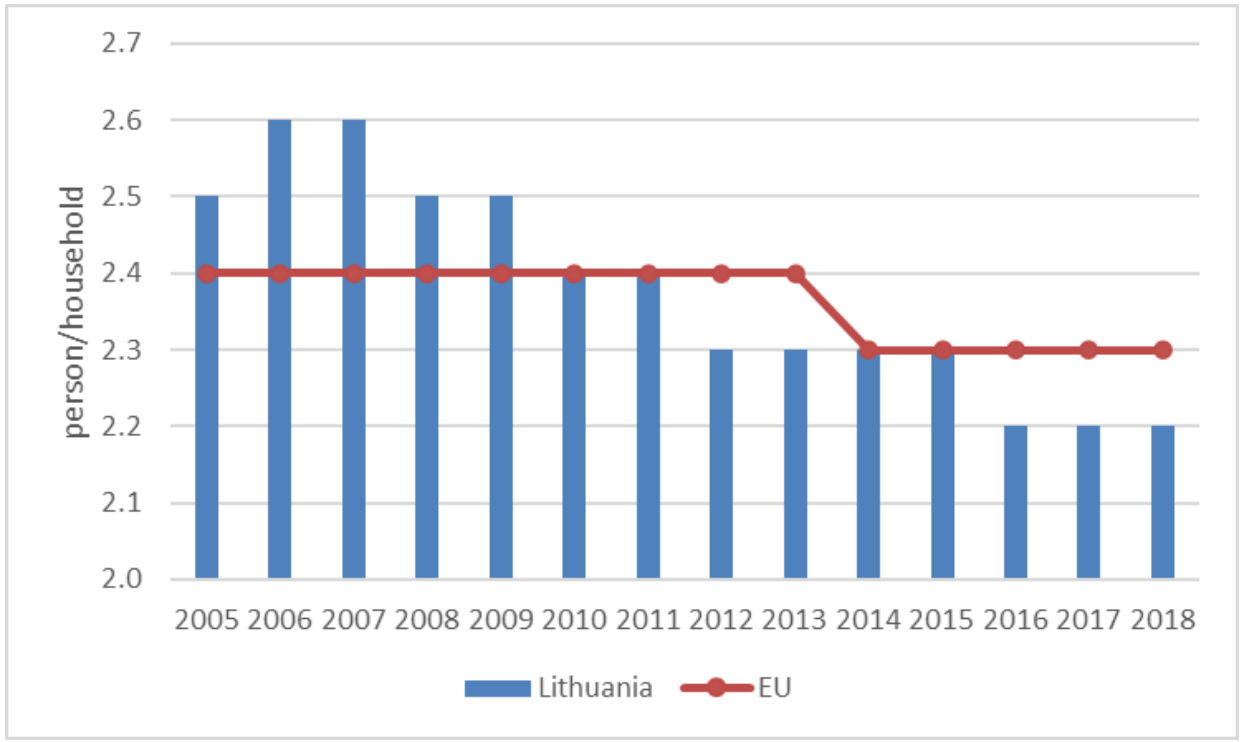
Obstacles & examples

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

Towards sufficient targets for the building sector indicators

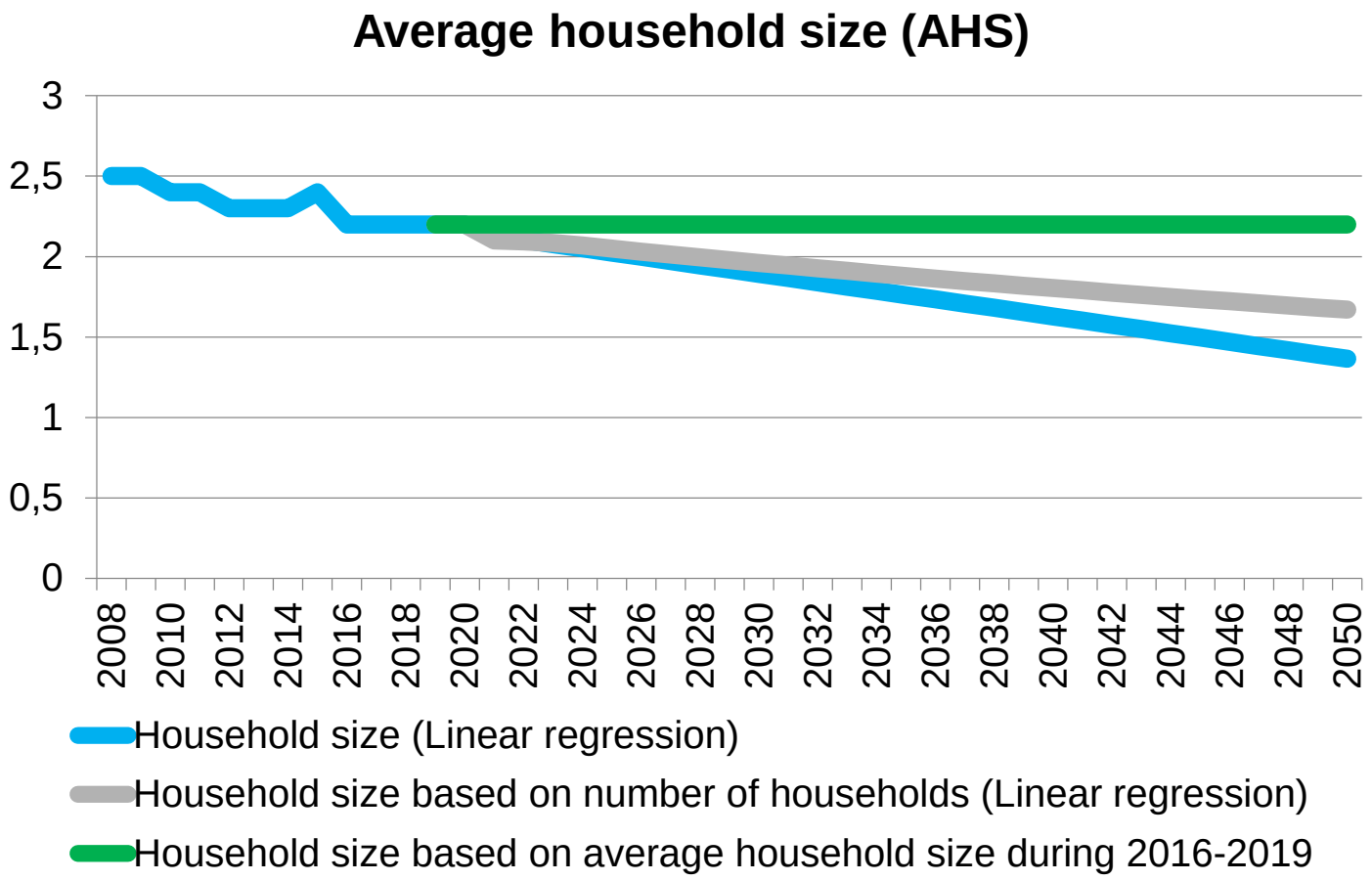
1a. Average household size (LEI)

Average household size



During 2008-2018 the AHS reduced from **2.5 to 2.2 persons**.

It is slightly smaller than in EU average - **2.3**.



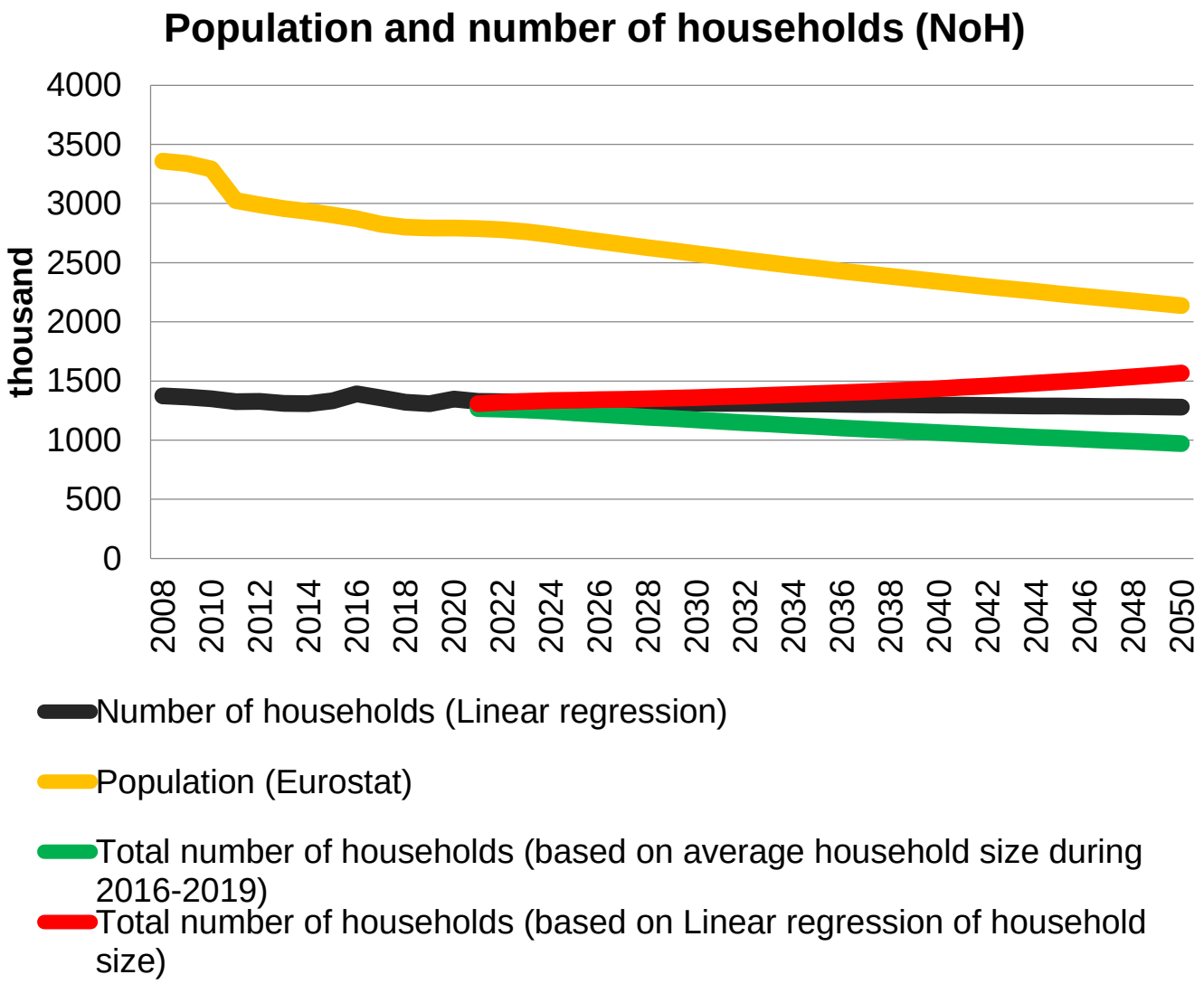
Target: **2.2 persons per household**
AHS could be fixed to **2.2 persons per household** by 2050.

The main reasons of this are:

- people choose to live single and families – without children and separately from their parents instead of intergenerational living style predominated till 1990's.
- Improving living standards create preconditions to live single in a dwelling.

The **trend of AHS could be improved through the social policy instruments** which deal with the problems of different type of household.

1b. Number of dwellings (LEI)

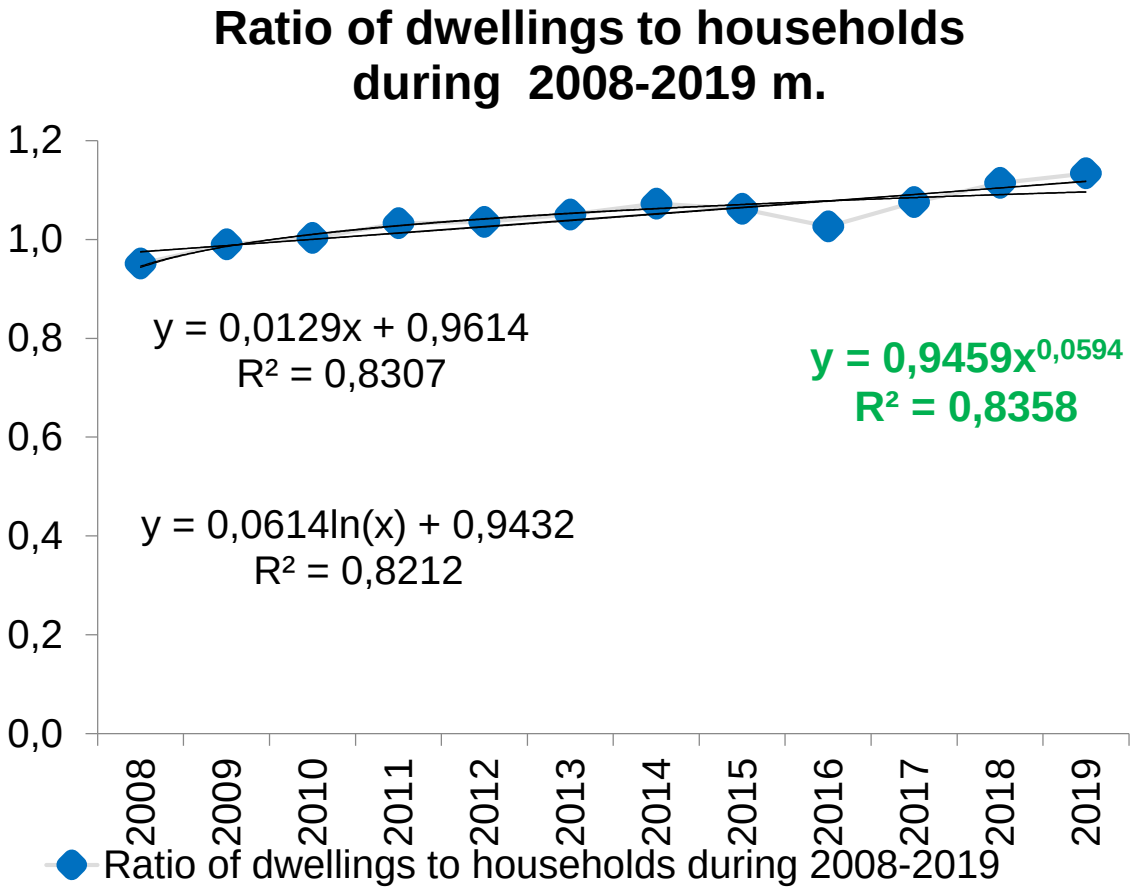


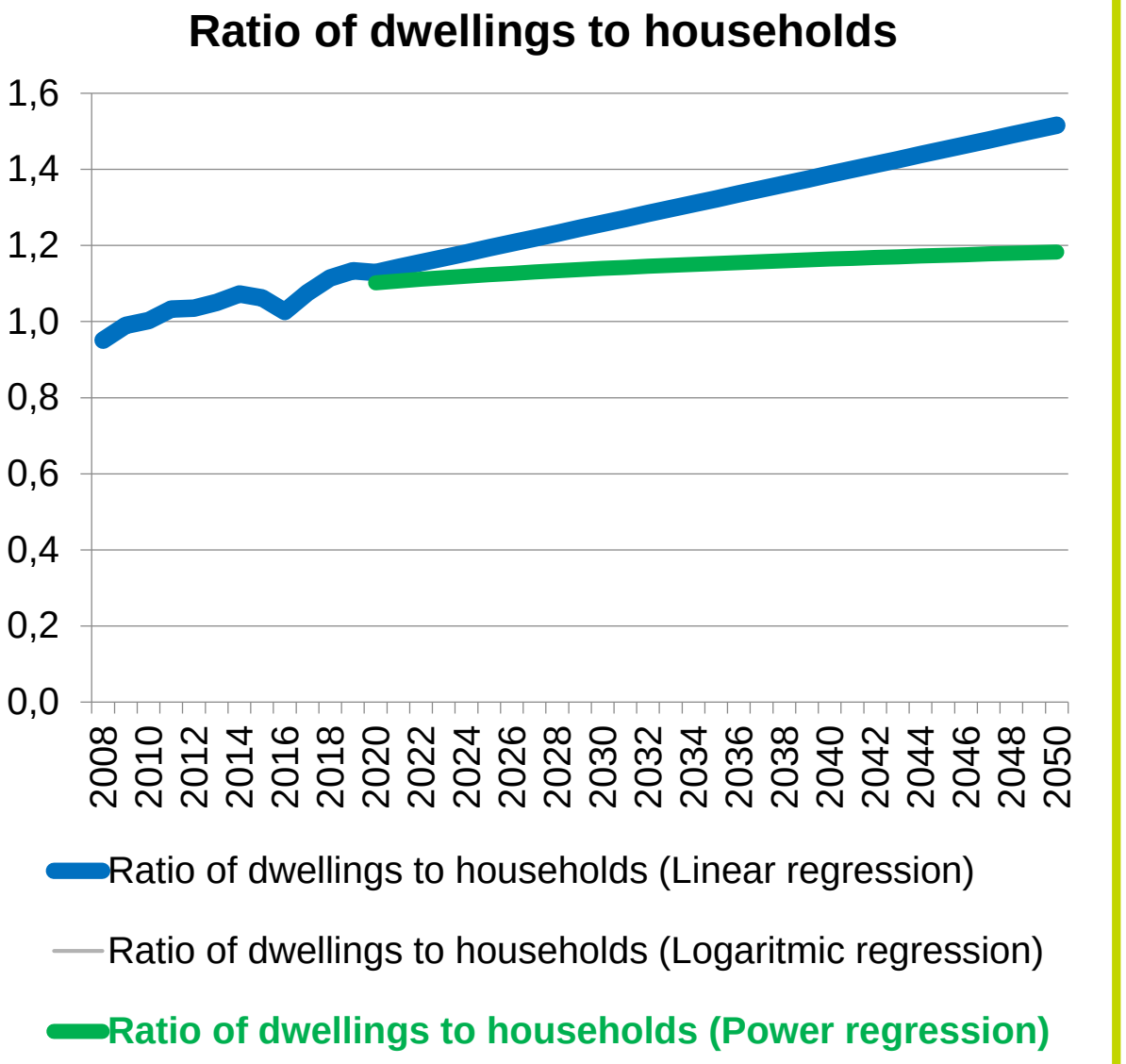
During 2010-2017 the NoH slighlty increased (by 8.1 thousand).

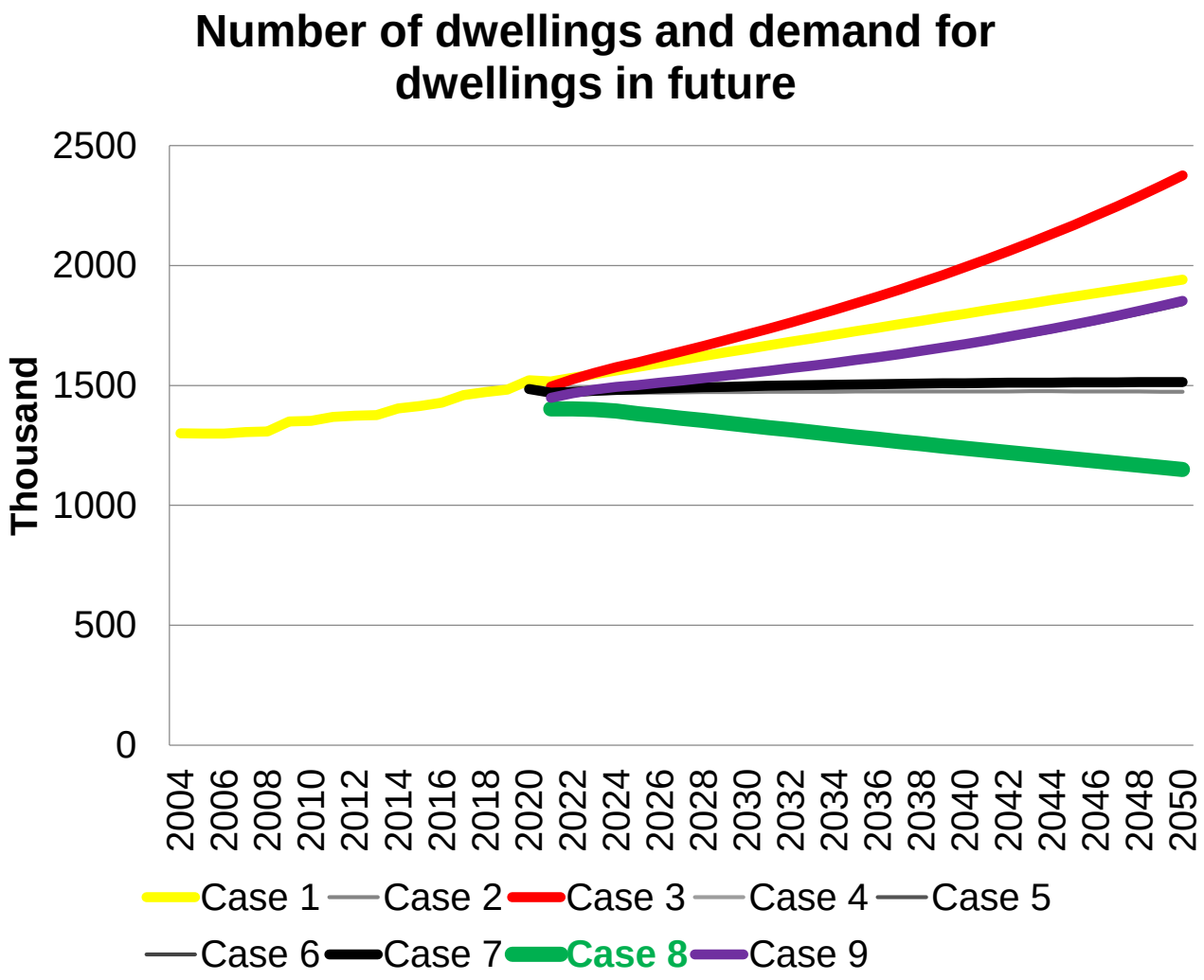
Following the living style when living single or without children is preferred and improved living standards, the number of households could be expected to increase in future (red line).

If emigration flows will not be managed this shall impact on decrease of households.

Due to expected reduction in population by 1,4% a year, **the number of households could reduce from 1357 thousand (2017) to 971,8 thousand (2050),** taking into account that household consists of 2.2 persons.


Ratio of dwellings to households during 2008-2019 m.
1,2
1,0
0,8
0,6
0,4
0,2
0,0
y = 0,0129x + 0,9614
R² = 0,8307
y = 0,9459x^0,0594
R² = 0,8358
y = 0,0614ln(x) + 0,9432
R² = 0,8212
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Ratio of dwellings to households during 2008-2019
Linéaire (Ratio of dwellings to households during 2008-2019)
Log. (Ratio of dwellings to households during 2008-2019)
Puissance (Ratio of dwellings to households during 2008-2019)


Ratio of dwellings to households
1,6
1,4
1,2
1,0
0,8
0,6
0,4
0,2
0,0
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
2028
2030
2032
2034
2036
2038
2040
2042
2044
2046
2048
2050
Ratio of dwellings to households (Linear regression)
Ratio of dwellings to households (Logaritmic regression)
Ratio of dwellings to households (Power regression)



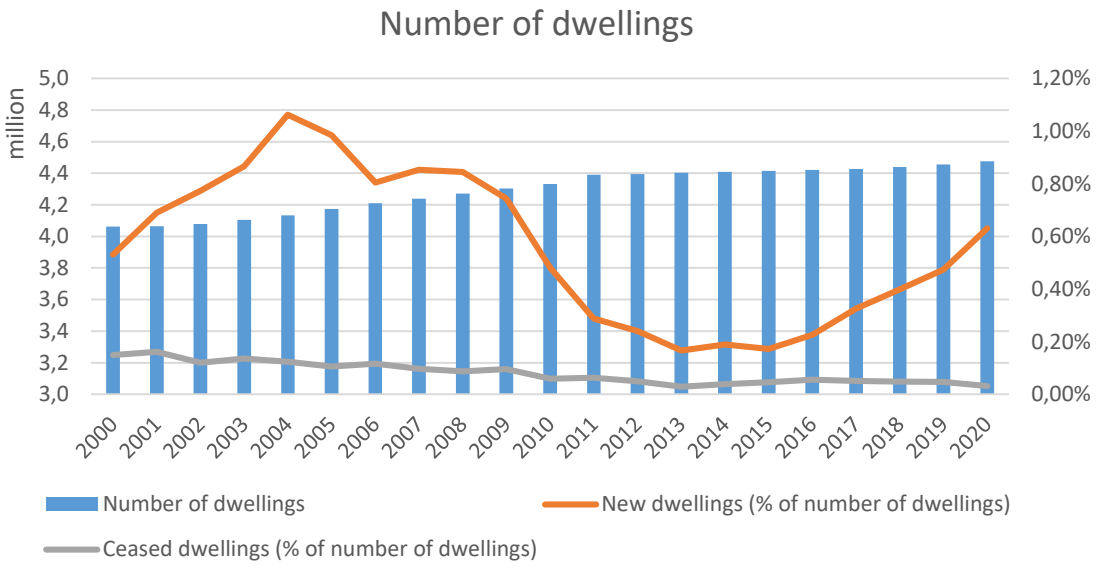
During 2005-2017 the number of dwellings increased and amounted to 1,459,405 units in 2017, from which 864,213 dwellings were in multifamily houses and 595,192 were in individual houses.

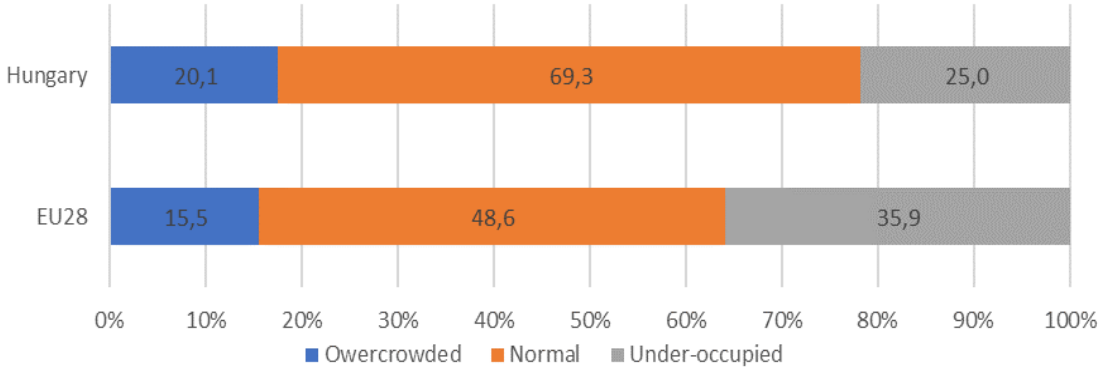
The number of dwellings in individual houses increases faster than the number of dwellings in other type of houses.

The pandemic situation impacts on behavior of people to purchase dwellings outside the cities.

Following the reduction in population, and the number of households, **the demand for dwellings could reduce in future**, as **green line** shows.

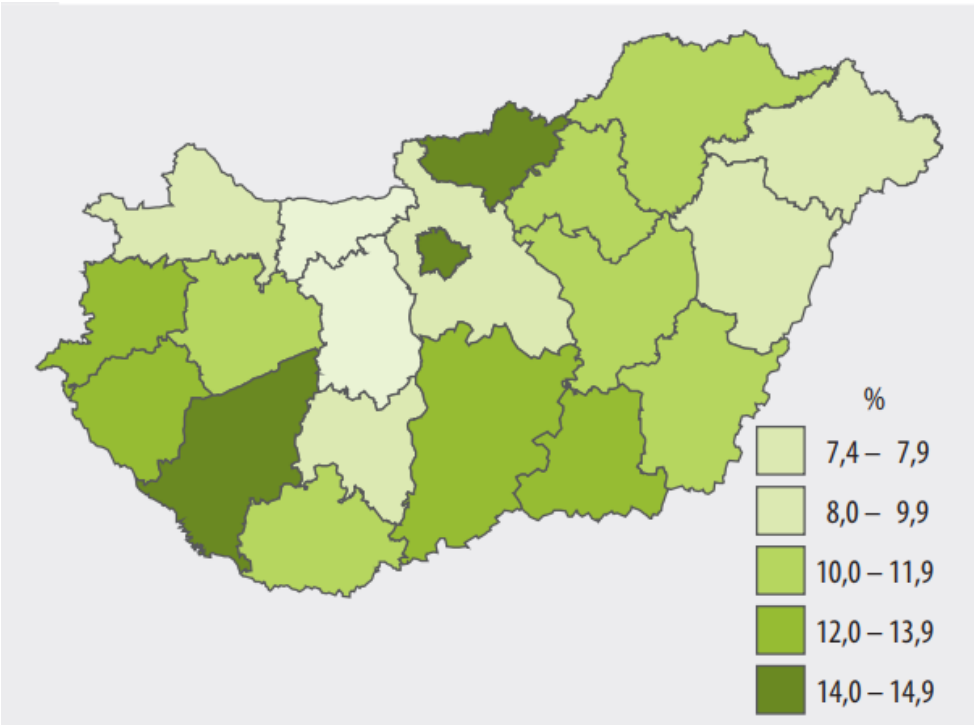
1c. Vacancy rate (REKK)





	Total	Inhabited		Vacant	
1970	3118	3034	97%	84	3%
1980	3542	3417	96%	125	4%
1990	2853	3688	129%	-835	-29%
2001	4065	3724	92%	341	8%
2005	4173	3937	94%	236	6%

2016	Total	Inhabited		Vacant	
Budapest	908	801	88%	107	12%
Towns	2281	2019	89%	262	11%
Villages	1216	1034	85%	182	15%
	4405	3854		551	

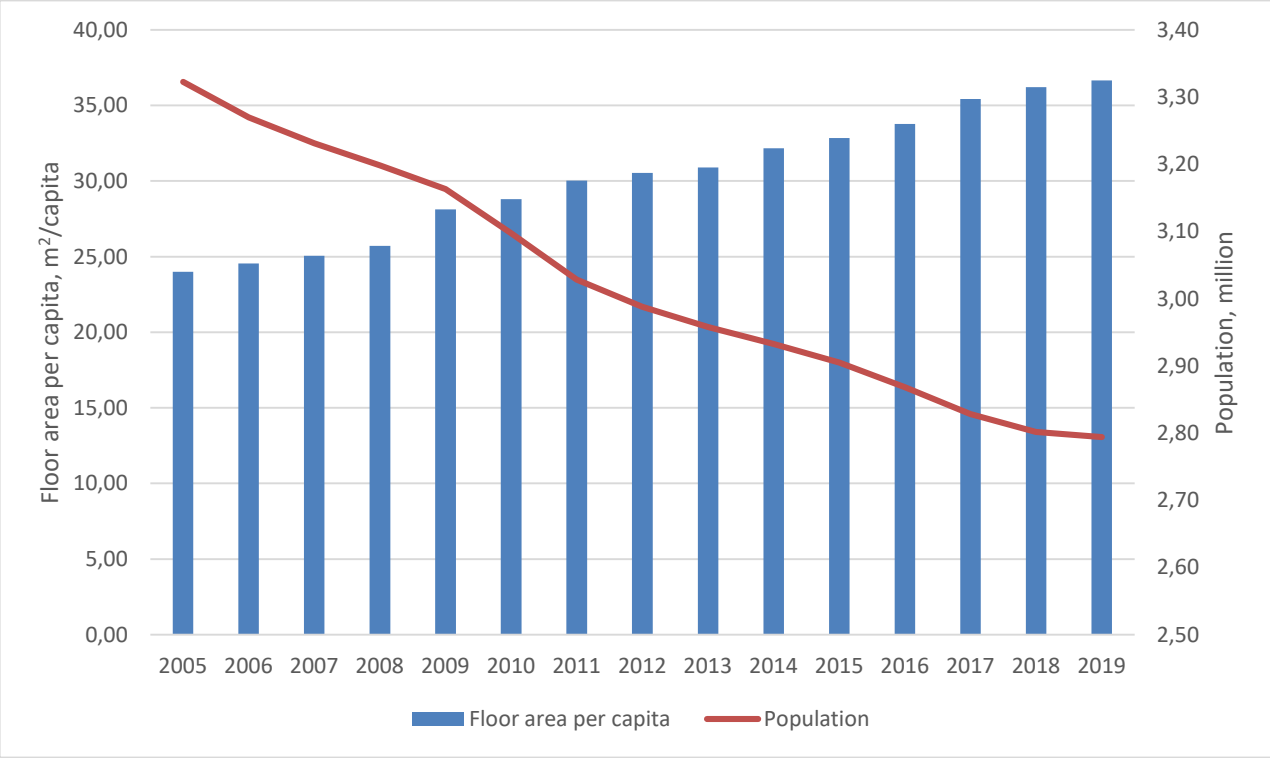


- Current trends will possibly increase vacancy rate in Hungary
- Factors which can offset the increasing vacancy rate:
  - Growing number of single-households
  - Utilization of empty dwelliings other than housing
  - Demolition of buildings with disadvantaged features

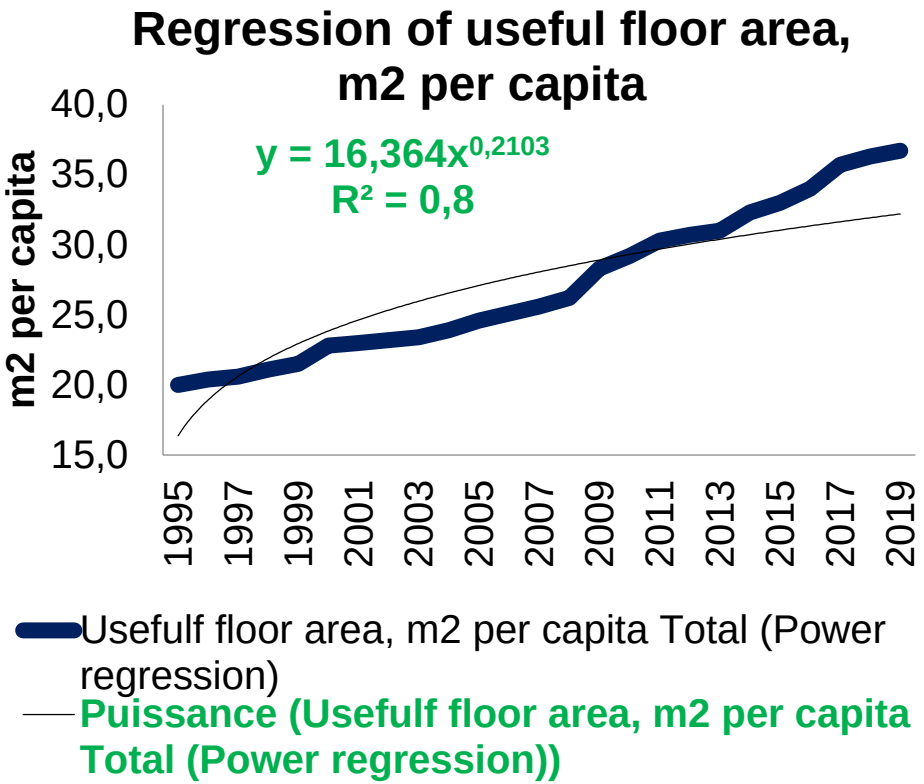
Non-household buildings

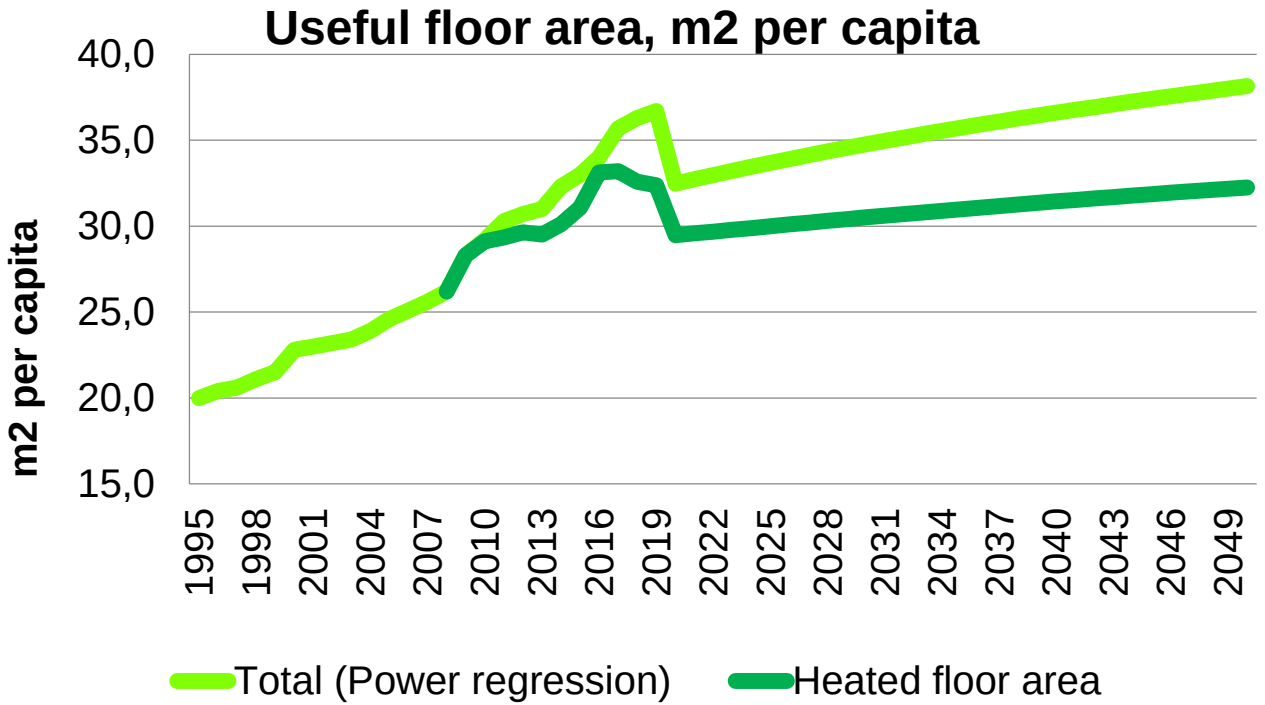
- Will the following trends significantly influence the demand towards non-household dwellings?
  - Increasing share of home office → smaller demand for offices
  - Increasing share of online shopping → smaller demand for tertiary buildings
  - Increasing share of online administration → smaller demand for public buildings

2a. Average floor area per capita (LEI)



The floor area per capita increases by 2.4% a year and was of **36.66 m²** in 2019, compared for example to 41 m² in France.





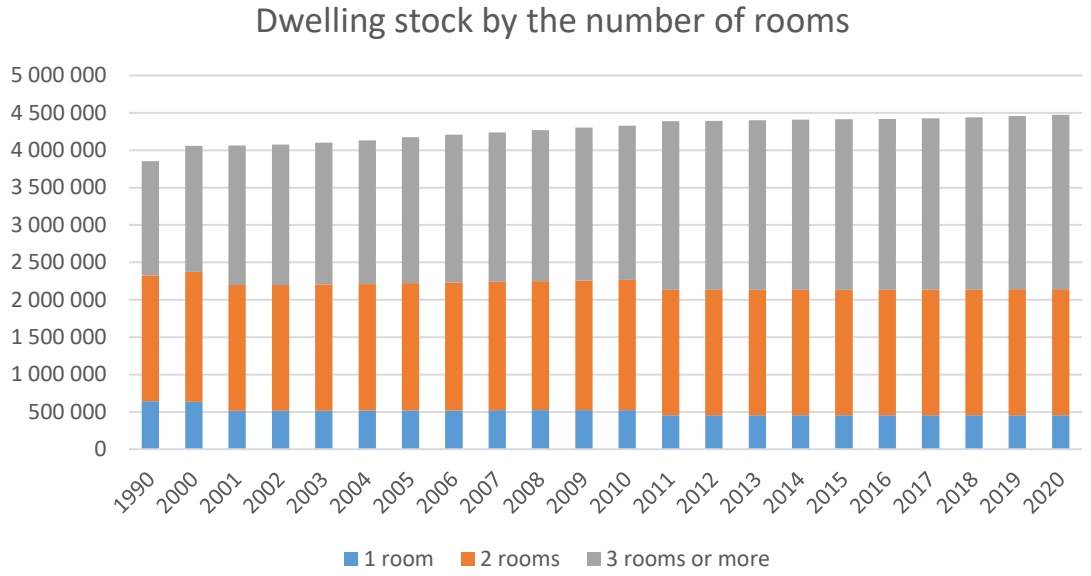
- **Useful floor area** could grow slowly by 0,9% a year, therefore, it could reach **38,2 m2 per capita** in 2050.

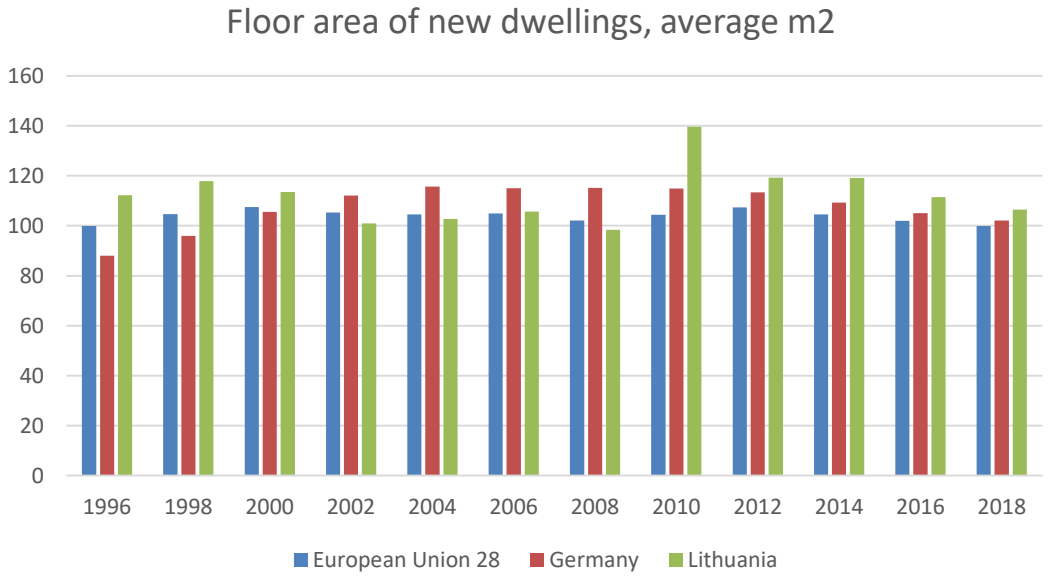
- Purchasing of individual houses outside the city, smaller flats in multifamily buildings in cities are relevant drivers of increase in useful floor area per capita.

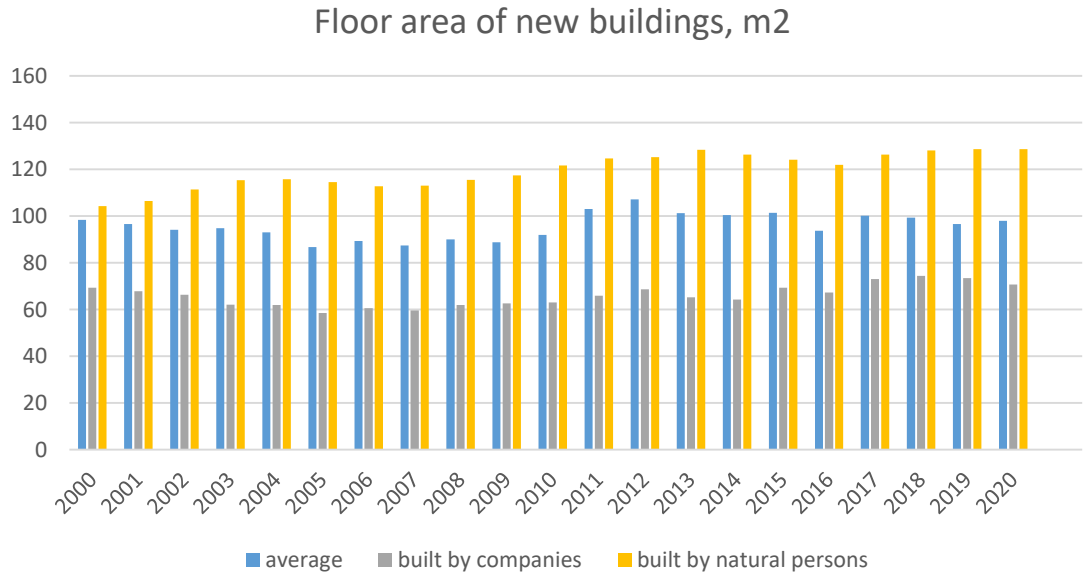
- Considering that the second dwelling is a summer house, an assumption was taken that these dwellings are not heated during winter time. Therefore, **heated floor area could be 32,3 m2 per capita** in 2050.

2b. New dwellings size (REKK)

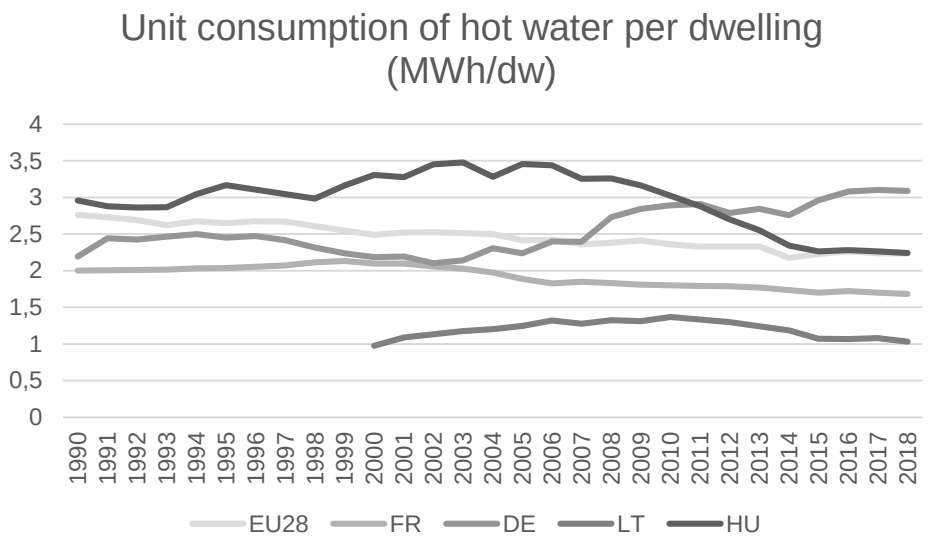
- Average floor area of dwellings does not differ much from the EU average or other countries' values
- The last two decades present both growing and decreasing periods, remaining close to the value in 2000
- TIMES modelling projects a 20% reduction in the average size of new dwellings

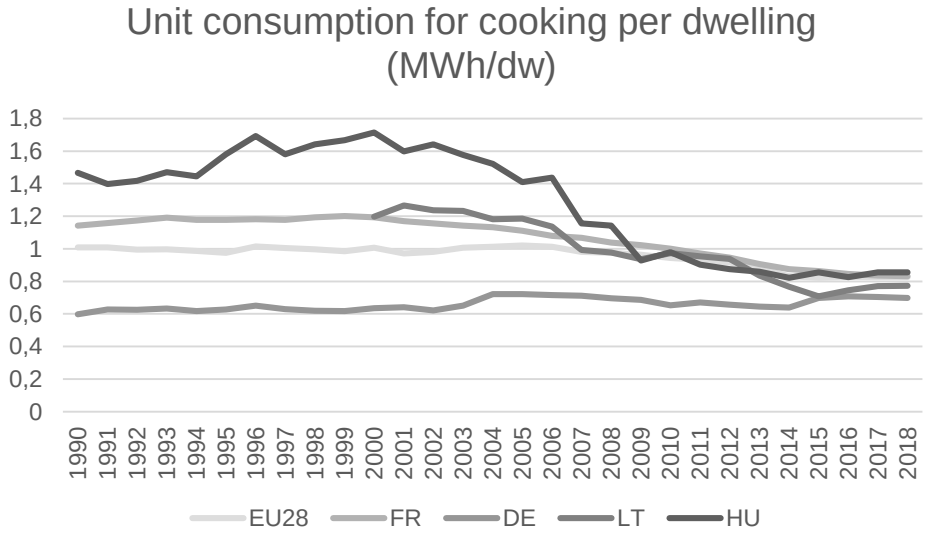






3. Other uses of heat (water, cooking) (REKK)





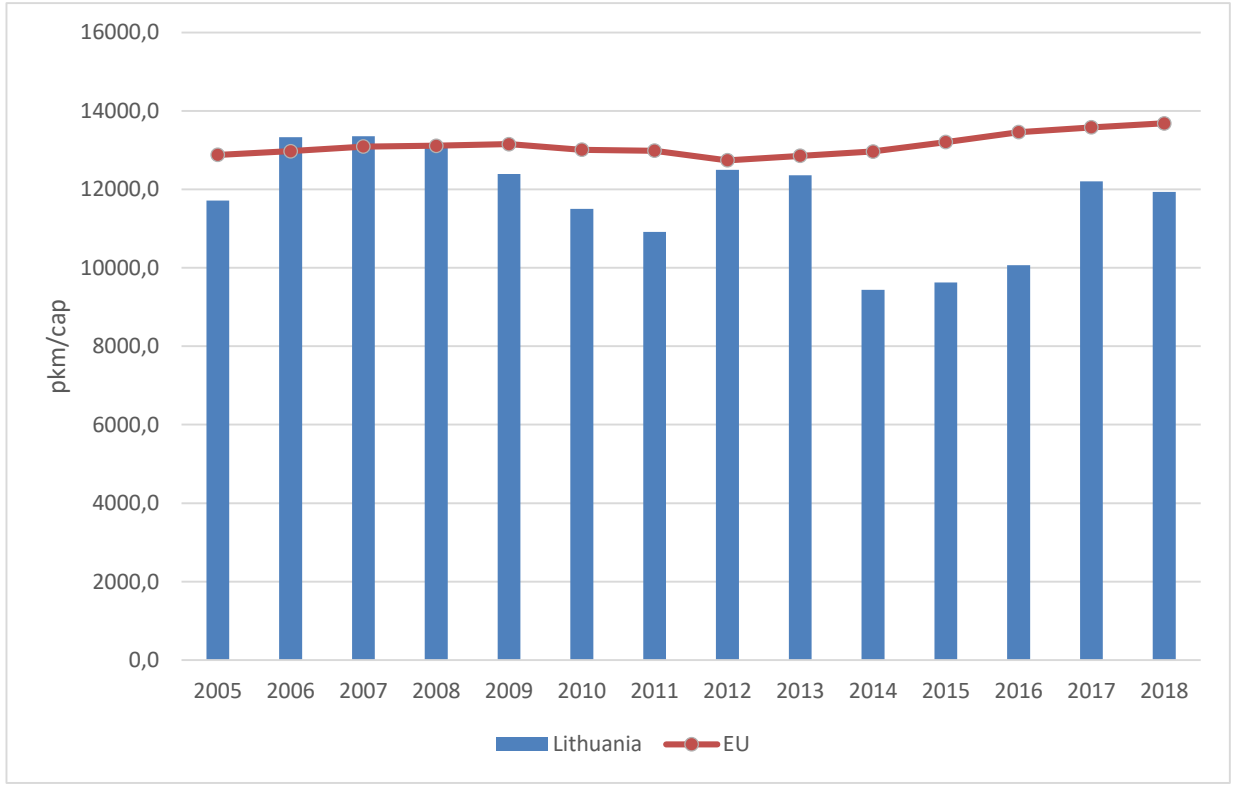
- Share in total household energy consumption (HU):
  - Water heating: 11.9-13.1% (2015-19)
  - Cooking: 4.4-5% (2015-19)
- TIMES projection shows a not continously but declinging trend until 2050 for aggregated energy used for cooking, 36% reduction compared to 2016
- Higher share of electrification is expected in both subsectors
- In case of high share of renewable electricity this change is beneficial
- Switching to residential renewable sources (small solar panels, heat pumps) is also beneficial
- Using dishwasers: energy usage migrates from hot water → to electrical appliances

- Retained potentials
  - Hot water consuption: targeting the Lithuanian level
  - Cooking: -18% reduction

Other indicators and way forward

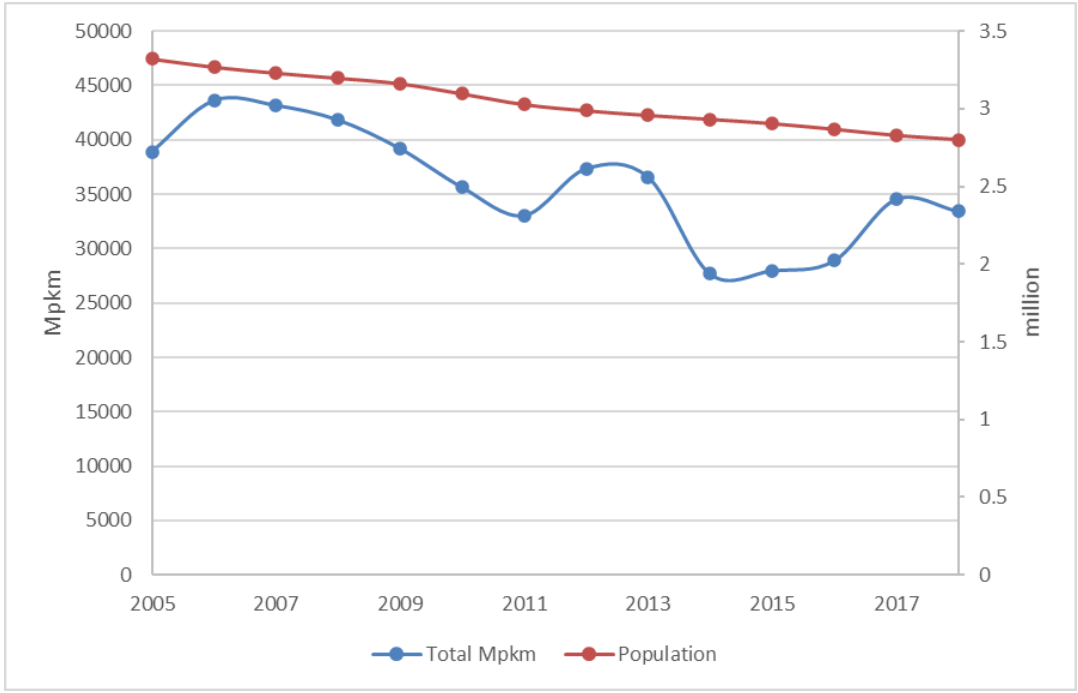
Towards sufficient targets for the transport sector indicators

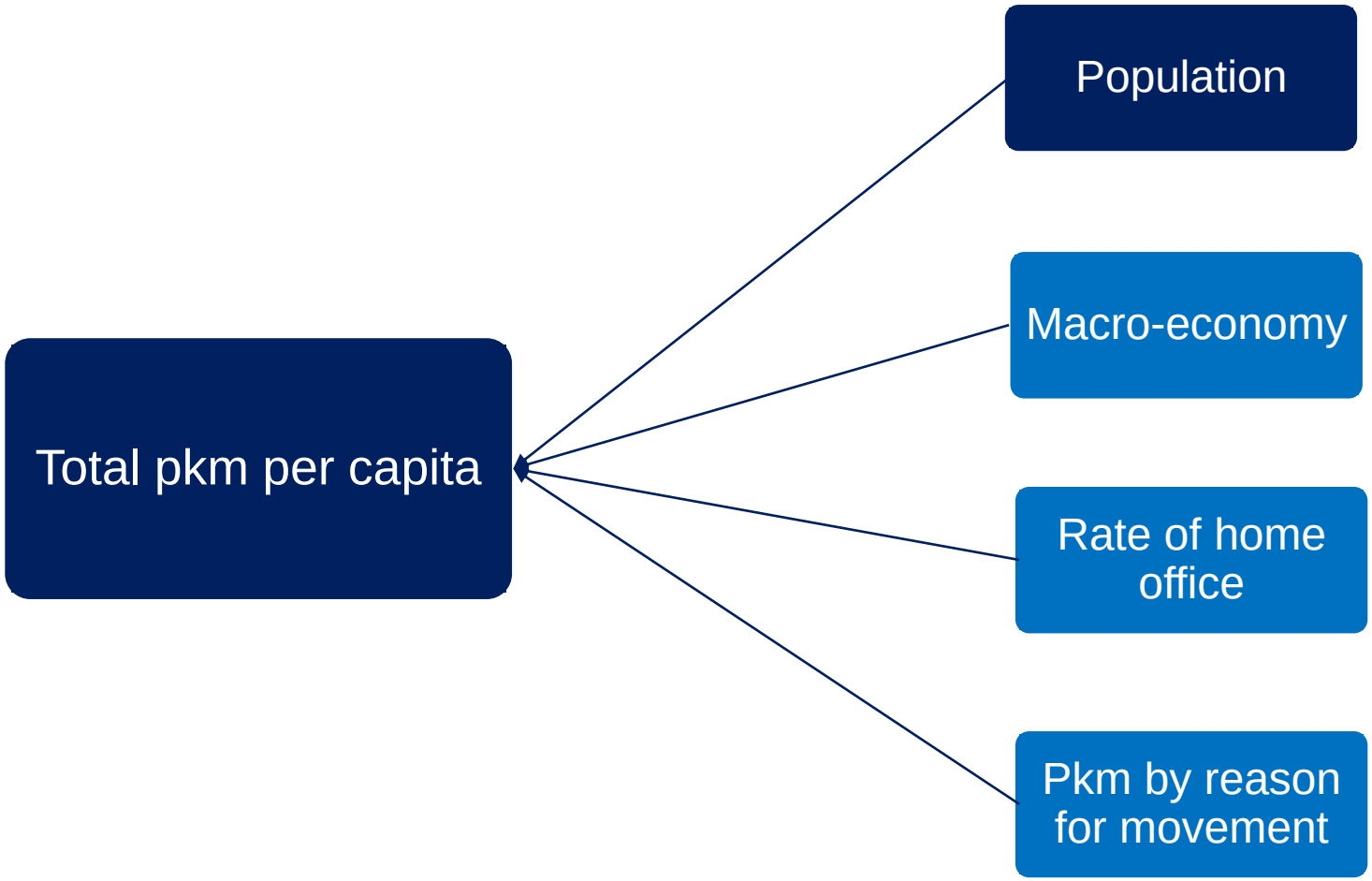
1. Total pkm per capita (LEI)



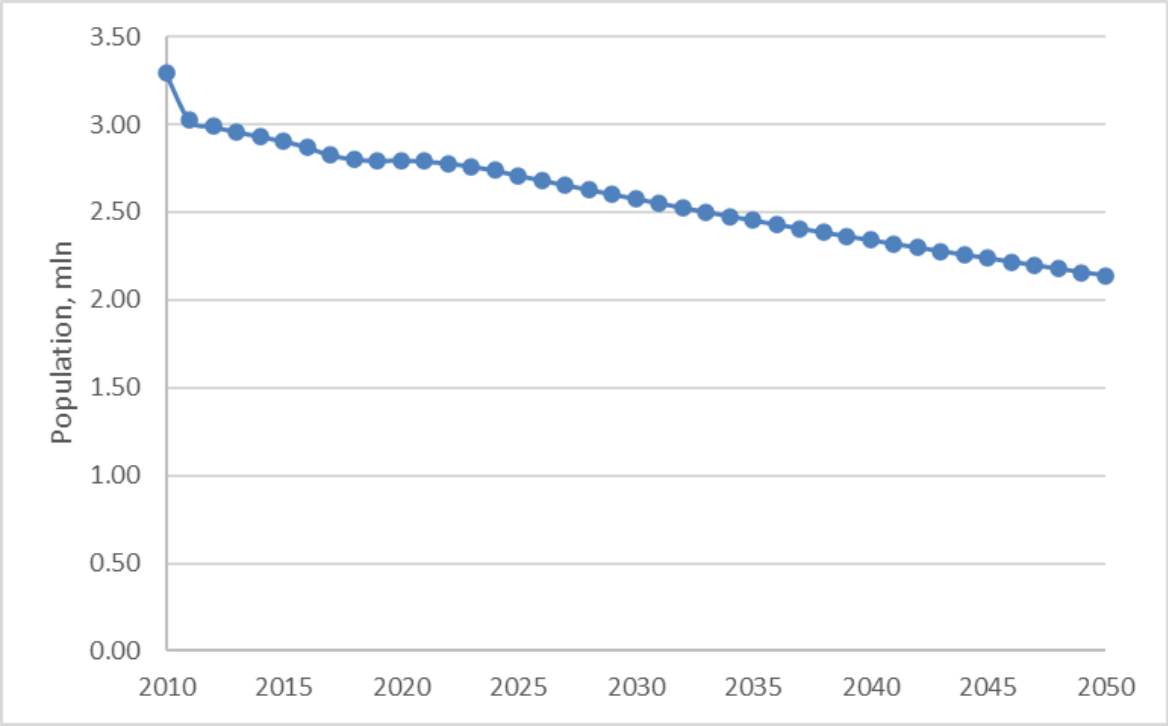
Pkm by soft mobility are not included in total pkm.

During 2014-2018 passenger travelling distances started **increasing by 5% a year**. On average **Lithuanians travel less** than the average EU where travelling distances has been constantly increasing since 2012.



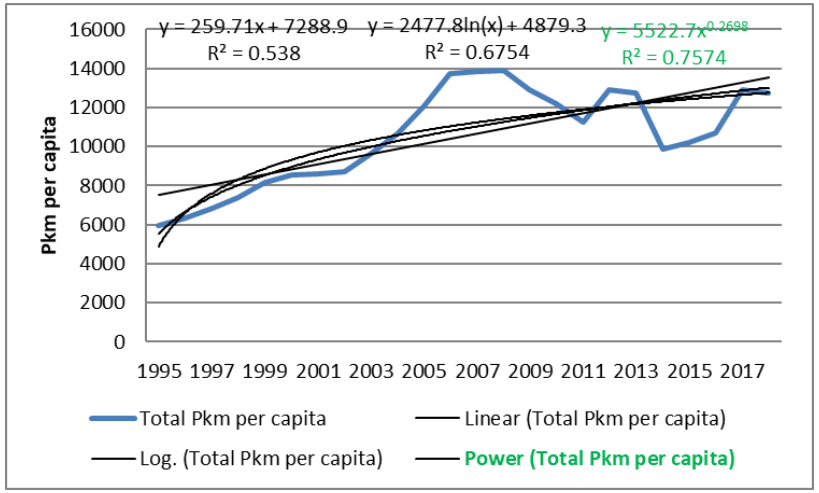

Total pkm per capita
Population
Macro-economy
Rate of home office
Pkm by reason for movement

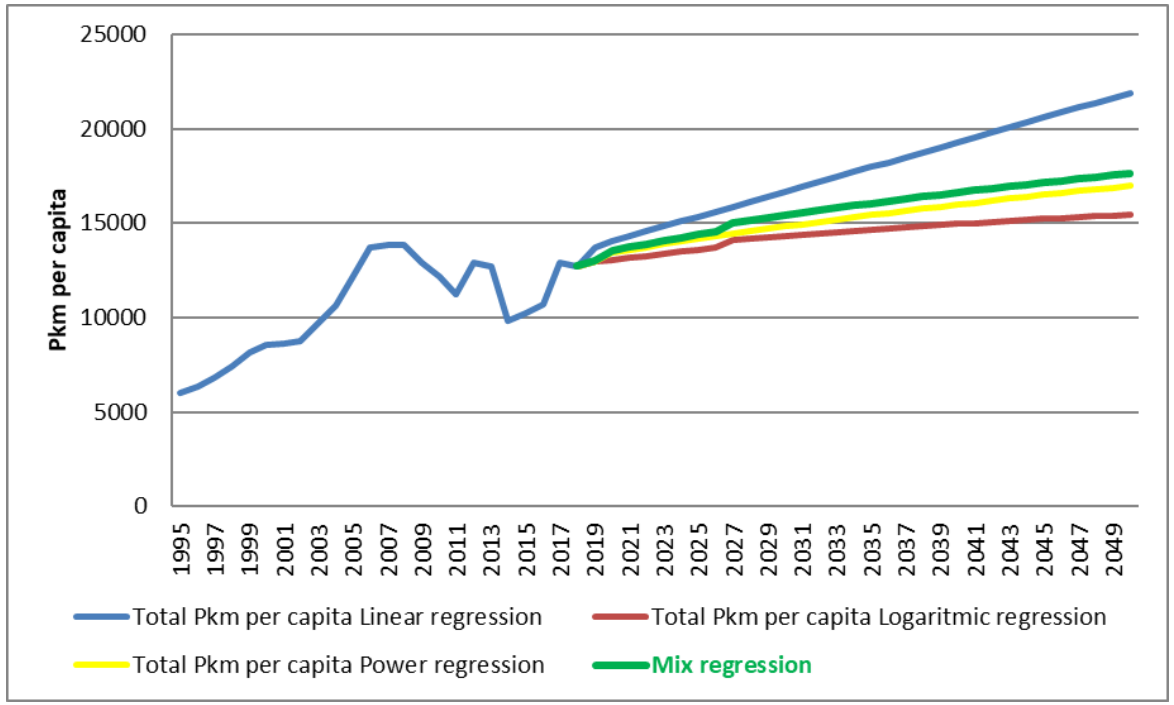
POPULATION FORECAST (EUROSTAT)



LT population:
2017 – 2.82 mln
2050 – 2.14 mln (EUROSTAT forecast)

Reduction 0.8% per year.

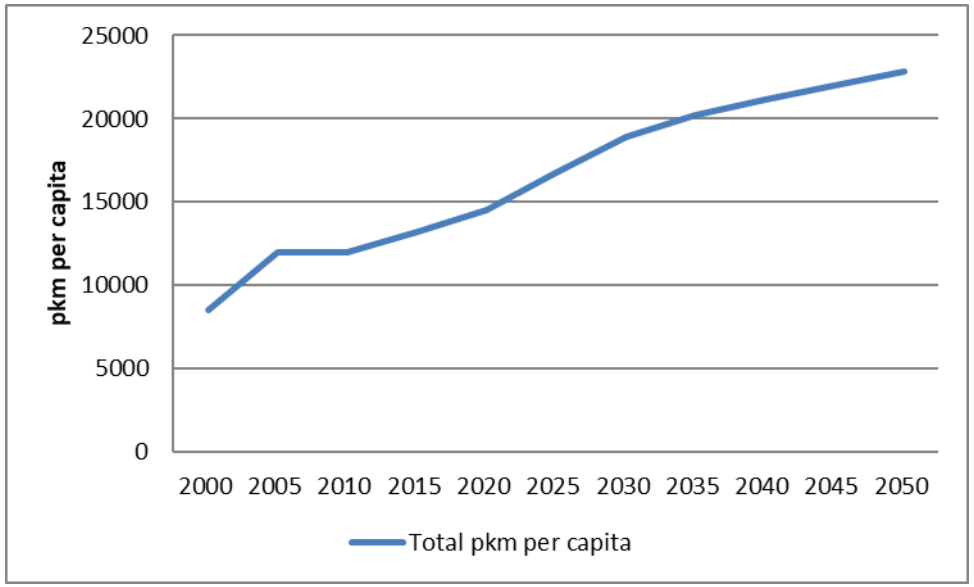




Target: 16218 pkm/cap/y
Grubler et al 2018 ("A Low Energy Demand scenarios for meeting the 1.5°C target")

2050: ~17000 pkm/cap/y

COMPARISON WITH PRIMES MODELLLING RESULTS



PRIMES 2050: 22840 pkm/cap

PRIMES modelling shows 25% higher estimations for 2050.

2. Pkm by soft mobility per capita (REKK)

Soft mobility per capita

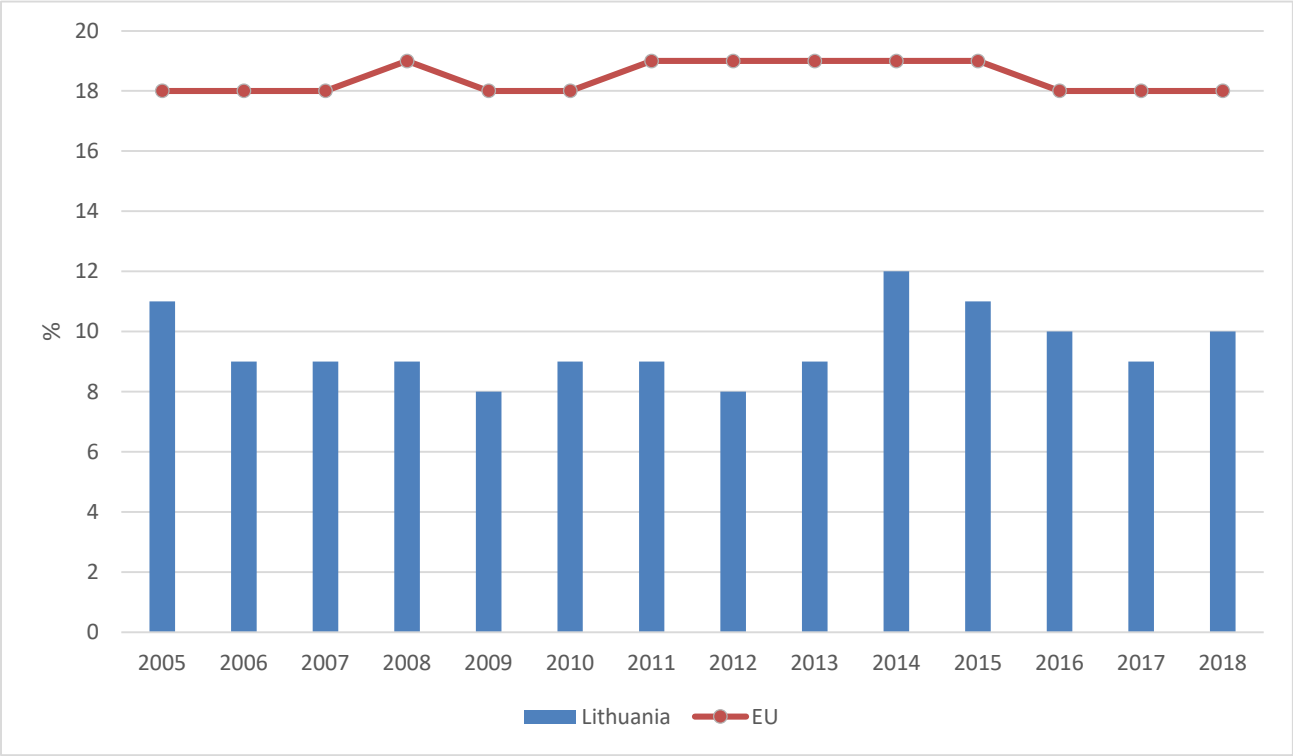
- Problem: no data for the whole country, only for Budapest
    - (2017): walking 12%, biking 2%, public transport 43%, passenger car 43%
    - goal for 2030: 15%, 5%, 50%, 30%
- Models (including the HU TIMES model) do not consider this mode of transport, as it does not go together with energy consumption
- *How to handle this?*
    - *Trying to give estimates for the country based on shares in other, similar countries - if available*
    - *Considering its increasing share through decreased demand for motorized transport modes*

To encourage soft mobility,

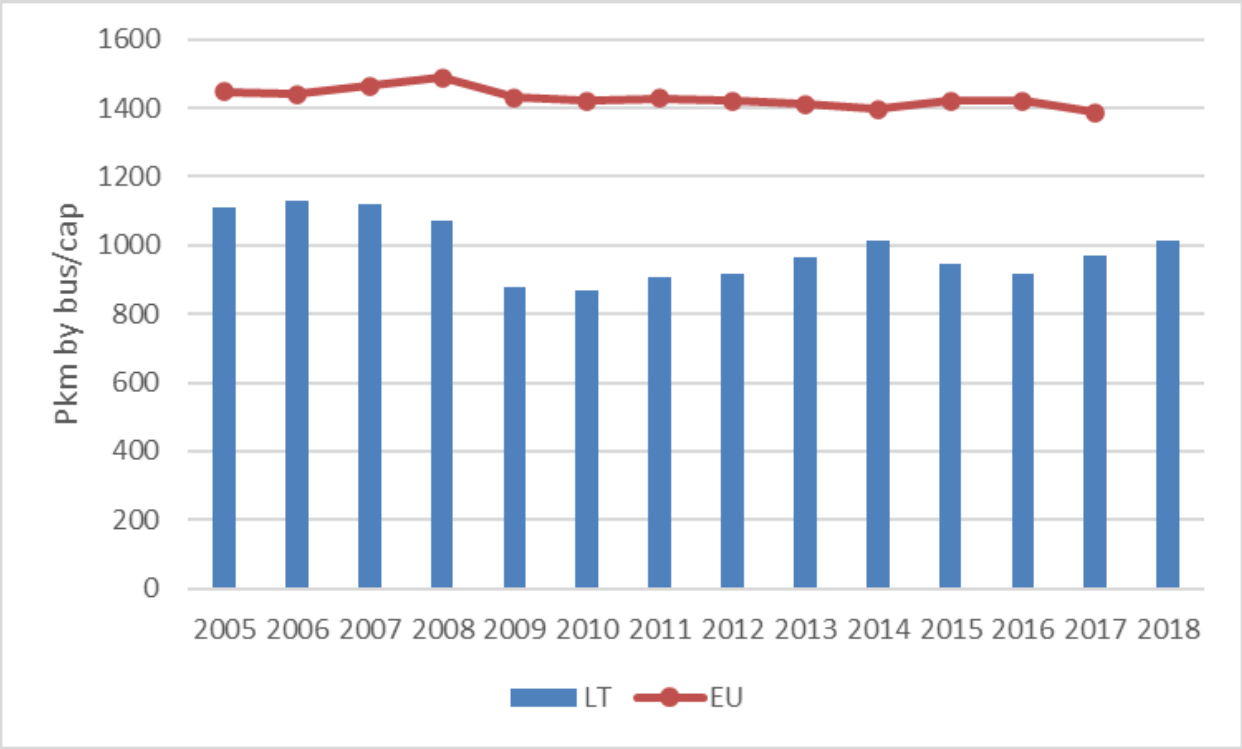
- it is important to have the right infrastructure (walking path, bicycle path, low traffic zones, well-designed residential areas with local shops, schools, gyms, etc.)
- awareness raising, emphasizing the healthiness dimension - cleaner motorized mobility in the future can contribute to more willingness to bike and walk

Pkm by bus per capita (LEI)

SHARE OF PUBLIC AND PRIVATE TRANSPORT



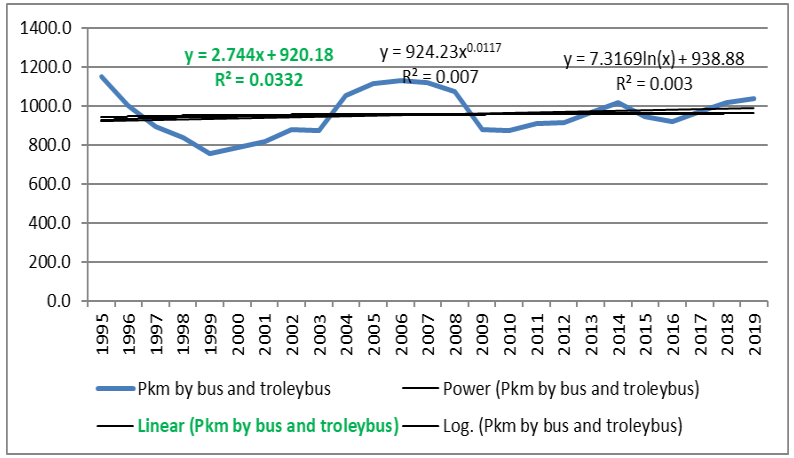
The attractiveness of **public transport** is considerably lower in Lithuania than in the EU as public transport accounted **only to 9.5%** of passenger transport in the country while in the EU it has been twice higher.

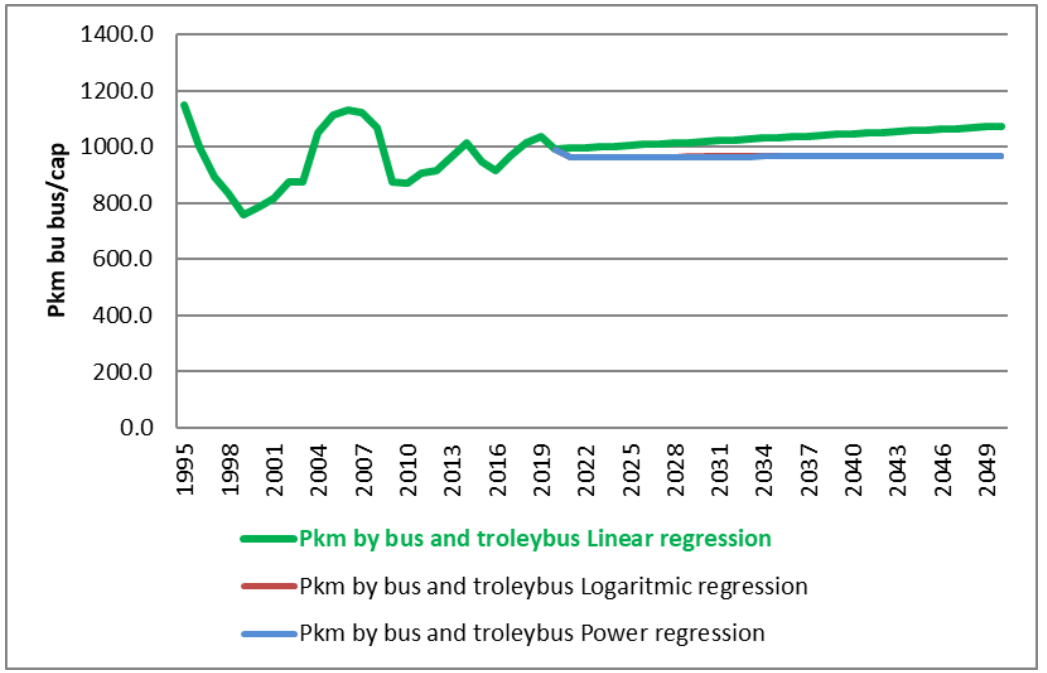


30% lower in Lithuania than in the EU.

Since 2010 pkm by bus/cap are increasing by **1.8% a year.**

Local pkm by bus/cap: 60%
Long-distance pkm by bus/cap: 40%





Target: 1968 pkm by bus/cap/y
Grubler et al 2018 ("A Low Energy Demand scenarios for meeting the 1.5°C target")

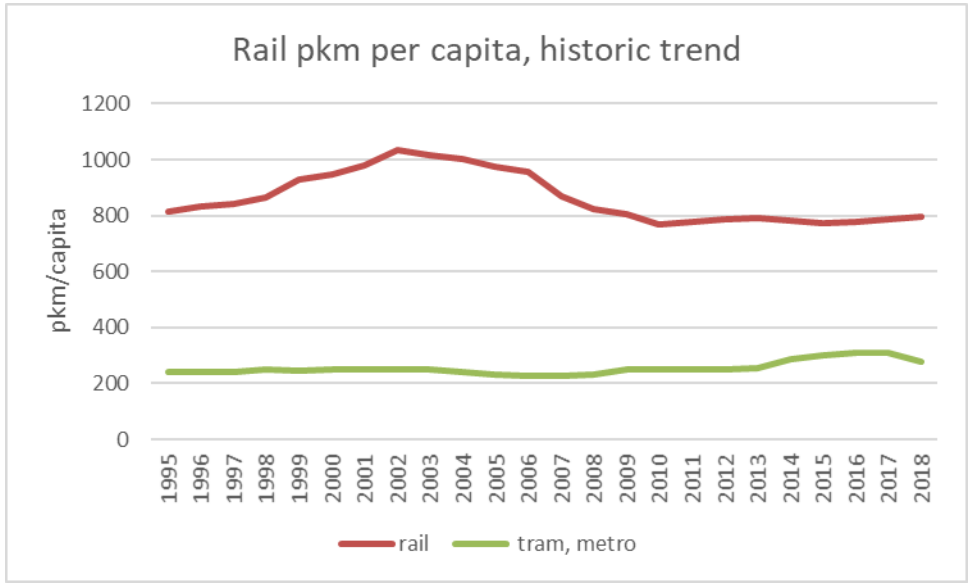
2050: ~1100 pkm by bus/cap/y

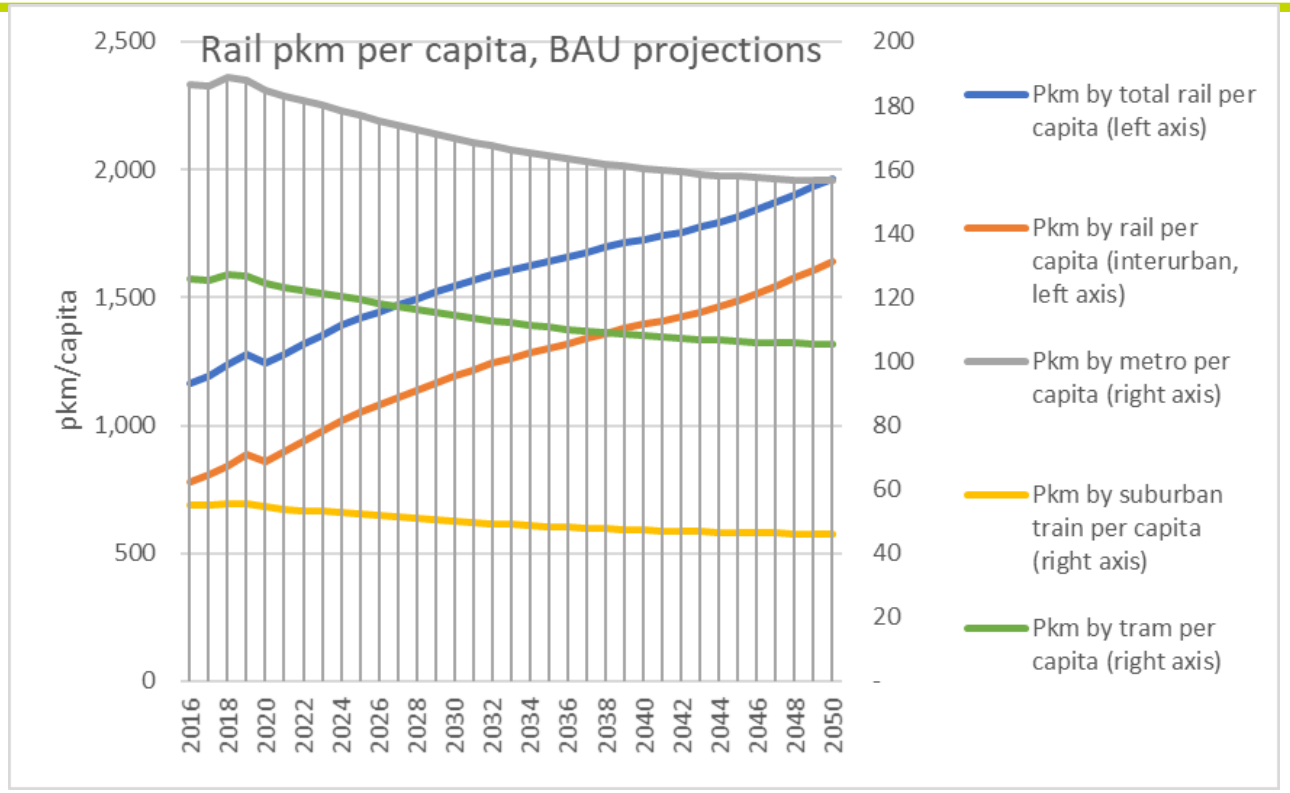
Quality and comfort of public transport:

- ✓ **Financial support** for renewal of public transport (buses and trolleybuses) from the Programme for Climate Change.
- ✓ **Comfortable timetables and high frequency:** analysis of **city mobility plans** shows that use of public transport could be faster in future.
- ✓ Urban **electronic tickets** (lower travel cost).
- ✓ **Smart tickets**: app “Žiogas” - an ICT solution developed by Kauno autobusai.
- ✓ **Advanced integrated ticket system** for different transport modes (urban and inter-city distances).
- ✓ **A ban** on entering to the city center by car.

Pkm by rail per capita (REKK)

Pkm by rail per capita, HU





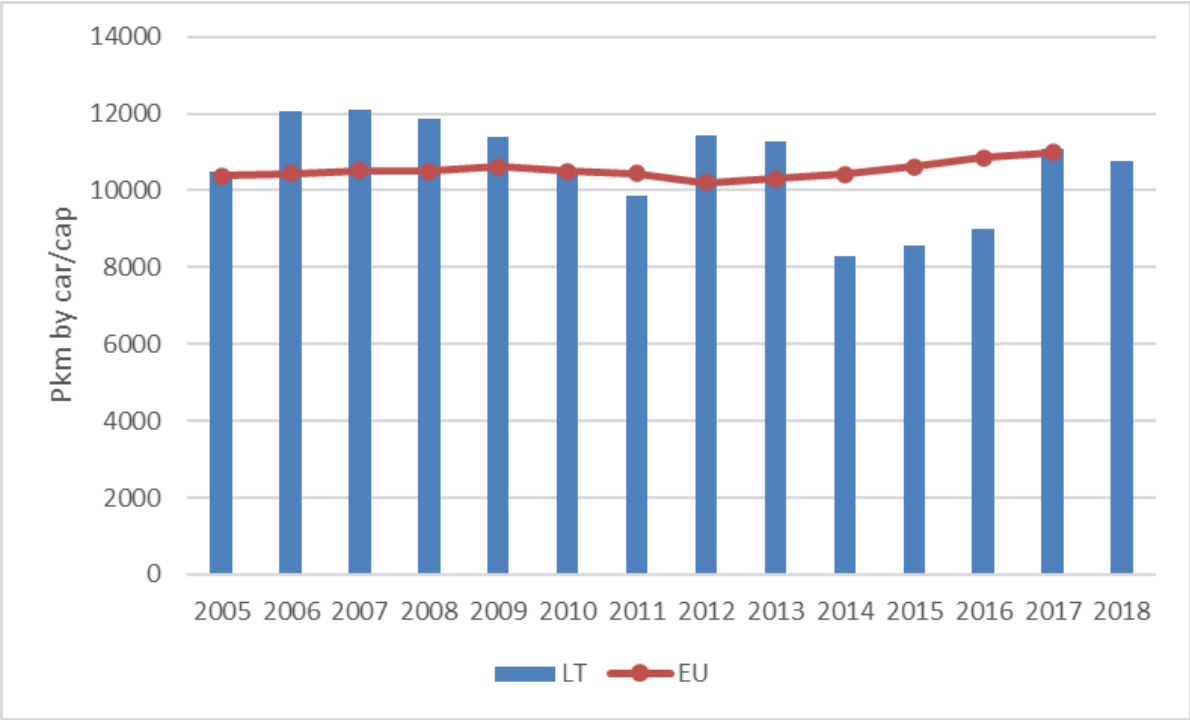
Theoretical potential :
- 2154 urban
- 3420 rural

Projected values:
- 308 pkm/cap urban
- 1640 pkm/cap rural

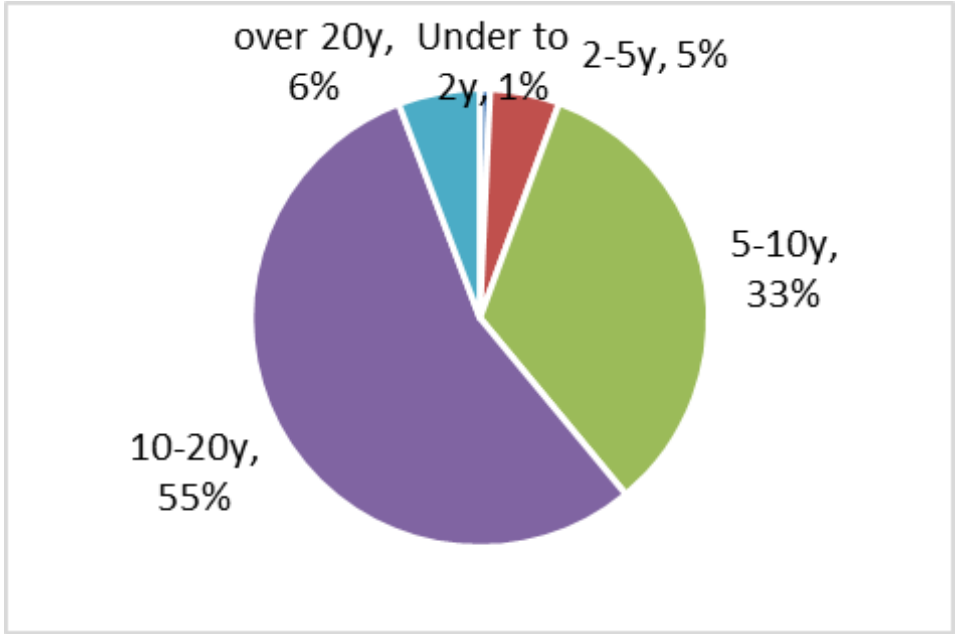
Suggestion
- 1000 urban
- 2000 rural

New developments:
- In Budapest, construction of metro tunnel to connect suburban lines with the city centre – will be called ‚Metro 5’
- Southern Rail Link project – connects suburban areas with new lines, and stations
- High speed rail line will go through Hungary
- No new rural lines, but upgrading old ones for higher speed and convenience, as well as increasing the rate of electrification

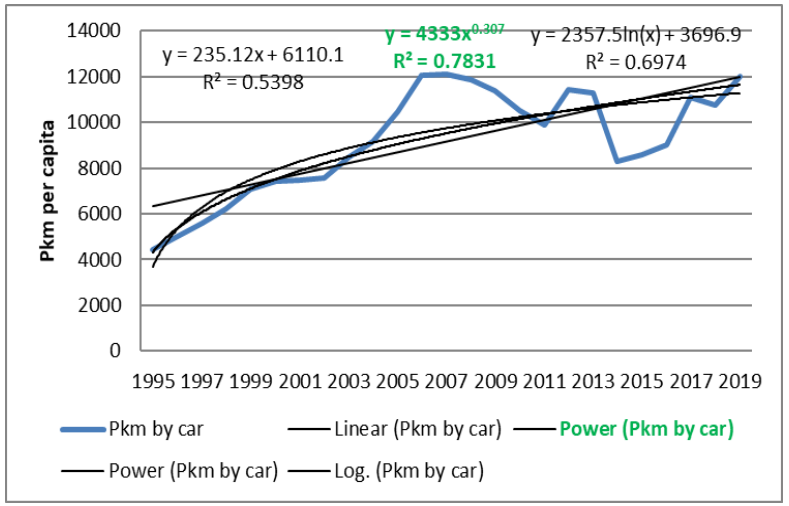
Pkm by car per capita (LEI)

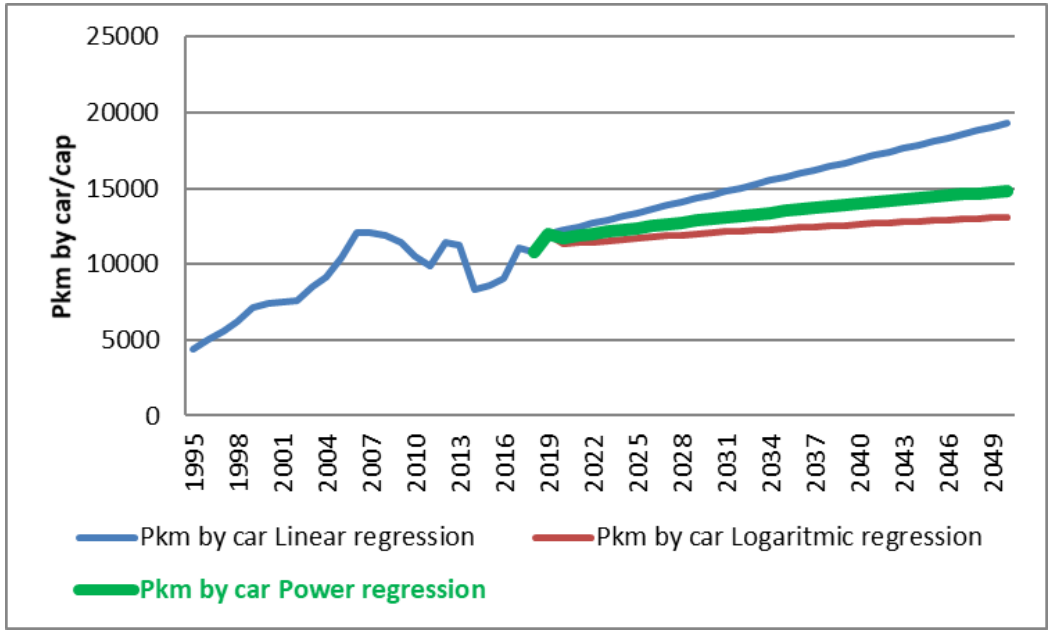


During 2014-2018 pkm by car/cap increased by 5.3% a year.



Half of private cars with average age of 15 years.





Target: 8674 pkm by car/cap/y
Grubler et al 2018 ("A Low Energy Demand scenarios for meeting the 1.5°C target")

2050: ~15000 pkm by car/cap/y

- ✓ **Financing of road infrastructure**: use of structural funds for infrastructure renewal and expansion.
- ✓ Improvement of **living standards** (increasing number of passenger cars per person).
- ✓ **Increasing pkm for commuting by car** due to travelling longer distances to work as people choose living outside cities.
- ✓ Promotion of **domestic tourism**.

- ➢ **Soft mobility.** The main driver - the constantly renewing of the existing bicycle path infrastructure and the building of new bicycle paths (combined with pedestrian paths). In 2014–2020, EUR 10.2 million of European Regional Development Fund investments were allocated for the construction and reconstruction of pedestrian and bicycle paths in Lithuania. The large cities are planning to invest more in cycling and walking paths in order to achieve sustainable mobility. A primary goal is to be able to drive from the residence with a bicycle to the work.
- ➢ **A short term rent (using apps)** of bikes or scooters.

Pkm by air per capita (REKK)

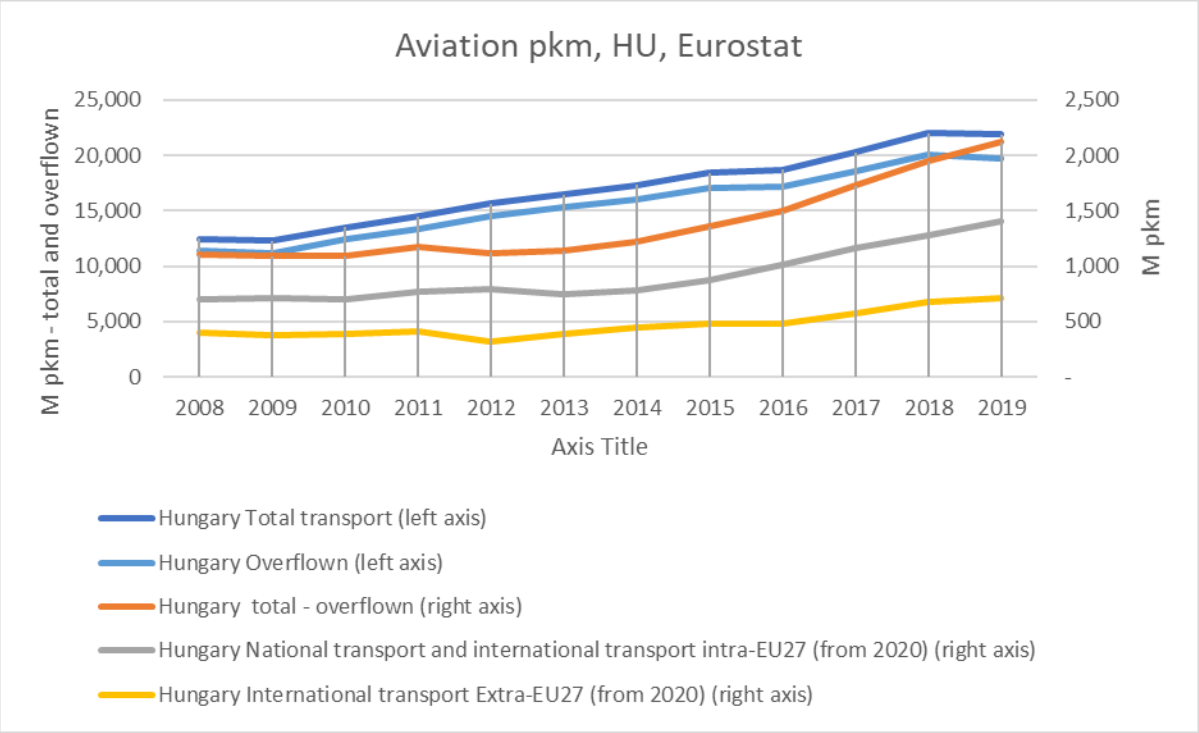
- Problem with pkm of air travel: different ways of calculating pkm
  - Eurostat uses the so called **territorialization**:
    - „The total tkm or pkm on an air route are, first, calculated based on passengers/freight transported between pair of airports and a distance matrix; and, then, the calculated tkm/pkm are ‘territorialised’ by **allocating them proportionally to the countries overflown,** according to the distance flown over each country.”
    - „It must be highlighted that the ‘territorialised’ air transport performance is a concept used only for comparing the transport modes' activity at countries' level. The resulting statistics are **not comparable with statistics on energy consumption** in transport **or with GHG emissions** as these are based on different methodologies.”
    - in case of road transport, the territoriality principle seem to work well, as it takes into account all movements carried out on the territory of the country (domestic and non-domestic vehicle movements) ≈ energy fuelled at inland fuel stations
  - CSO in HU gathers data of airline companies
  - Primes: data exclude international extra-EU aviation

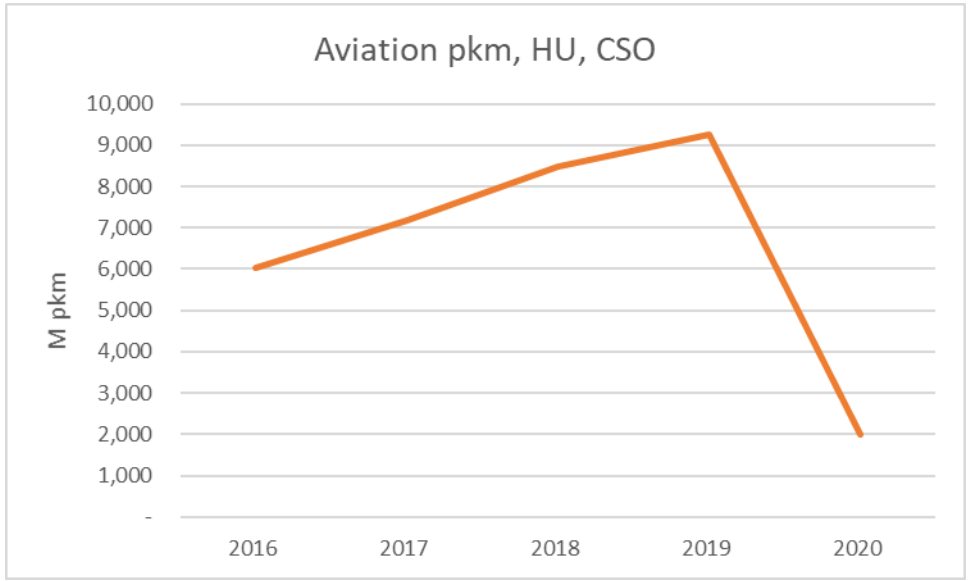
Which one shall we use?? Primes?

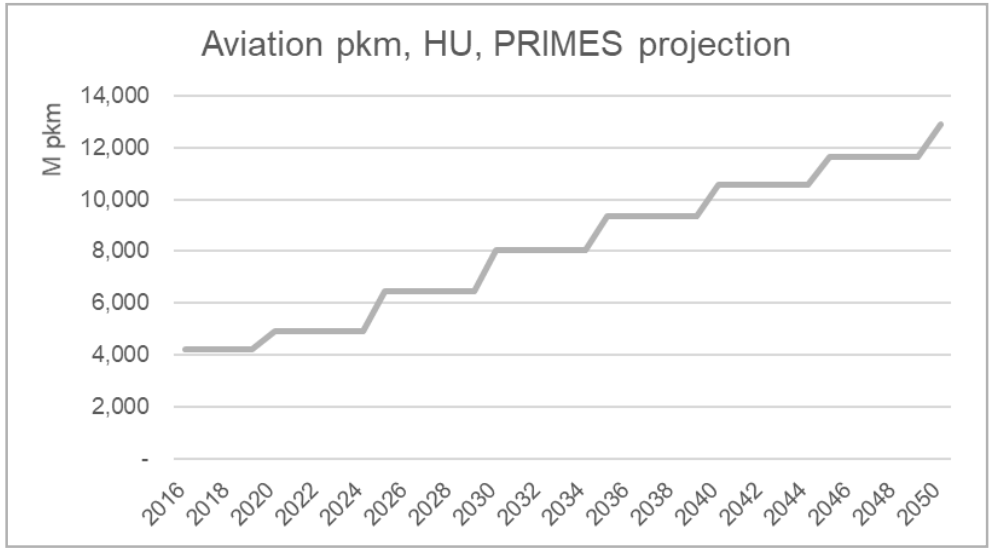
Shall we estimate pkm from energy consumption (domestic + bunker in NIR)?

Pkm by air per capita, HU

Eurostat, domestic and PRIMES statistics







Pkm by air per capita, HU

Theoretical potential: 1160-1840 pkm/cap/yr

	Eurostat	Primes	CSO
2017 per capita pkm	176.17	429.80	735.71
2050 per capita pkm, primes		1,388.93	

We suggest 1000 pkm/cap – can be influenced by

- higher environmental costs (higher EUA prices and including extra-EU flights in ETS, revision of the Energy Taxation Directive - taxing kerozene)
- supporting train lines versus flights in case of shorter routes
- higher prices → less demand → smaller No. of available flights from Bp might further decrease pkm..

Next step on remaining indicators

Number of people per vehicle

Planning further activities

	Goals and activities	February (M8	March (M9)	April (M10)	May (M11)	June (M12)	July (M13)	August (M14	ptember (M	October (M16	vember (M1	ecember (M1
Outcome	National scenario builders acquire an in-depth understanding of energy sufficiency, its											
Output I	WPI- Insight on energy sufficiency in target countries. Scenario builders have											
Activity I.1	Introductory workshop on the sufficiency concept and potentials in target countries											
Activity I.2	Analysis of existing official nationals strategies: overview of demand-related actions, identifications of gaps in which sufficiency potentials are not yet tapped											
Activity I.3	Analysis of the national context: identifying socio-cultural barriers and specificities that may alter the way we apprehend sufficiency action	2 analytical briefs										
Output II	WPII. Technical capacity building on the integration of energy sufficiency in sectoral scenarios AND WPIII: Technical dialogue exploring ways to model sufficiency and its											
Activity II.1	Development of quantitative and qualitative indicators on sufficiency in two sectors											
Activity II.2	Data collection and classification of indicators		classification table?									
Activity II.3	Assessing potentials and building assumptions considering national contexts				assumptions workshop							
Activity II.4	Analysis of status quo of the scenario models	preliminary draft										
Activity II.5	Technical dialogue on good practices to implement sufficiency in existing models									modeling workshop		
Activity II.6	Potential outputs of the models and impacts of sufficiency										short report	
Output III	WP IV. Reaching out to policy makers in partner countries (policy module) Relevant national policy-makers have acquired a better understanding of energy sufficiency and its role for mitigation strategies.											
Activity III.1	National policy briefs summarising the project's results and policy assumptions to decision makers											policy briefs sent
Activity III.2	Policy dialogue with decision-makers from target countries						policy workshops		policy workshops	policy workshops		
Output IV	larger network of relevant European stakeholders has been familiarised with the concept of energy sufficiency as well as results from CACTUS exploratory work to include it in scenarios from two sectors in target countries.											
Activity IV.1	Development and animation of communication tools and networking strategy											
Activity IV.2	Peer review, networking and publication activities	abstract submitted									EEDAL conference	

Activity II.5

Technical dialogue on good practices to implement sufficiency in existing models (M8-M16)
The technical dialogue will address different aspects of the model enhancements and discuss their advantages and challenges in order to identify the best ways to model sufficiency in the target countries. A modelling workshop will be organised and address the following issues:

● Analysing and discussing three strategies for dealing with the indicators from WPII in the models: 1) parameter settings (e.g. ownership rate), 2) logic upgrade to integrate additional sufficiency aspects, and 3) implementation of a new logic.

● Comparing scenario rationales: economic modelling based on cost-optimisation vs. models based on physical simulation, and hybrid approaches (e.g. time-budget) and advantages/disadvantages of top-down vs. bottom-up (more disaggregated).

Synergies and exchange of knowledge will also be developed with the Nordic-Baltic research project working on modelling approaches around sufficiency. Representatives from the project will be invited to participate and present their results at the workshop.
Policy makers' feedback on the feasibility of considered sufficiency assumptions from the policy workshops from WPIV will help to precise the modelling approach in WPIII.

Responsible partners: Fraunhofer ISI (under cooperation project) leading, REKK, LEI and négaWatt participating

Activity II. 6

Potential outputs of the model and impacts of sufficiency (M15-16)
The technical dialogue in A III.3 will build on the results of the scenario and modelling dialogues implemented in A.II.3 (WPII) and AIII.2 (WPIII). It will focus on making the impacts of sufficiency measures (positive or negative) visible in target countries. The dialogue shall consist in a joint analysis from the target countries, which will be then summarised in the short report in AIII.1, and:

- List the quantifiable and direct impacts of energy sufficiency
- List the indirect impacts of energy sufficiency
- Propose a strategy to deal with non-quantifiable impacts

Responsible partners: Fraunhofer ISI (under cooperation project). REKK and LEI leading, négaWatt participating

Milestones:
- MIII.1: a preliminary draft report on the status quo of the models is available by M6.
- MIII.2: a modelling workshop on integrating sufficiency in modelling has taken place and results are documented through a PowerPoint, by M16.
- MIII.3: the short report is finalised and includes the impacts of sufficiency, by M16.

Policy (Output III)

Work package (WP IV): Reaching out to policy makers in partner countries (colead REKK and LEI; M9-M18) (Policy module)

Activity (A III.1) National policy briefs summarising the project's results and policy assumptions to decision-makers (M9-M18)

Implementing partners will develop one policy brief for each country, presenting the project's results achieved in WPI & II for policy-makers on the role of sufficiency in mitigation strategies. The briefs will be finalised after the policy workshops so as to respond to contributions from policy-makers and integrate results from WPIII, including on impacts, as well as two separate analyses on the buildings and transport sectors as well a short set of policy recommendations and best-practices identified on sufficiency policies implemented in other European countries.

Activity (A III.2) Policy dialogue with decision-makers from target countries (M11-M16)

A policy workshop in each target country will be organised to present and discuss the key content of the work achieved so far with key policy and decision makers and stakeholders.

Preliminary results from WPII & III will be discussed, most particularly the feasibility of assumptions based on policy-makers' understanding. Discussions will feed into the finalisation or refining of the modelling work implemented in WPIII. In Lithuania, the dialogue will also build upon recommendations and key results from the policy exchange within the programme on energy poverty referred to in 7.1, enabling a valuable exchange on the role of sufficiency in policies fighting energy poverty.

Analysis of possible energy sufficiency policy options. Buildings

Lliterature analysis

- Instruments for limiting average dwelling floor area per person
  - Municipal support
  - Financial incentives
  - A cap for municipalities on dwelling floor area per inhabitant
  - Supported with other financial and educational incentives
- Electricity sales caps and trade for suppliers
- Instruments supporting energy-efficient and sufficient purchase and use of equipment, and other domain-related practices
  - Energy pricing instruments (ensuring proper dealing with energy poverty issues)
  - Sufficiency-oriented product policy
  - Energy sufficiency advice
  - Financial incentives (for buying energy saving appliances etc.)
  - Promotion of energy-sufficient services
  - Securing and creating the energy-sufficient infrastructure

Analysis of possible energy sufficiency policy options. Transport

Lliterature analysis

- Extensive education
- Good public transport
- Infrastructure for “self-catering”:
  - Infrastructure development for bicyclists and pedestrian
  - Ensuring safety and preferential treatment
- Financial measures:
  - Car taxation
  - Ticketing
  - Financial incentives
- Cultures of consumption

Infographic Style

Make it possible

Make it attractive

Make it standard

Make it visible

Discourage or regulate non-sufficiency

Communicating and disseminating

- **Communication on website and EUKI platform**
  - *II.3 table?*
- **EEDAL conference postponement**

CACTUS

STRENGTHENING CENTRAL AND EASTERN EUROPEAN CLIMATE TARGETS THROUGH ENERGY SUFFICIENCY

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