CACTUS

STRENGTHENING CENTRAL AND EASTERN EUROPEAN CLIMATE TARGETS THROUGH ENERGY SUFFICIENCY

Modelling Energy Sufficiency in Appliances

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July 2021

Supported by:

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

European Climate Initiative EUKI

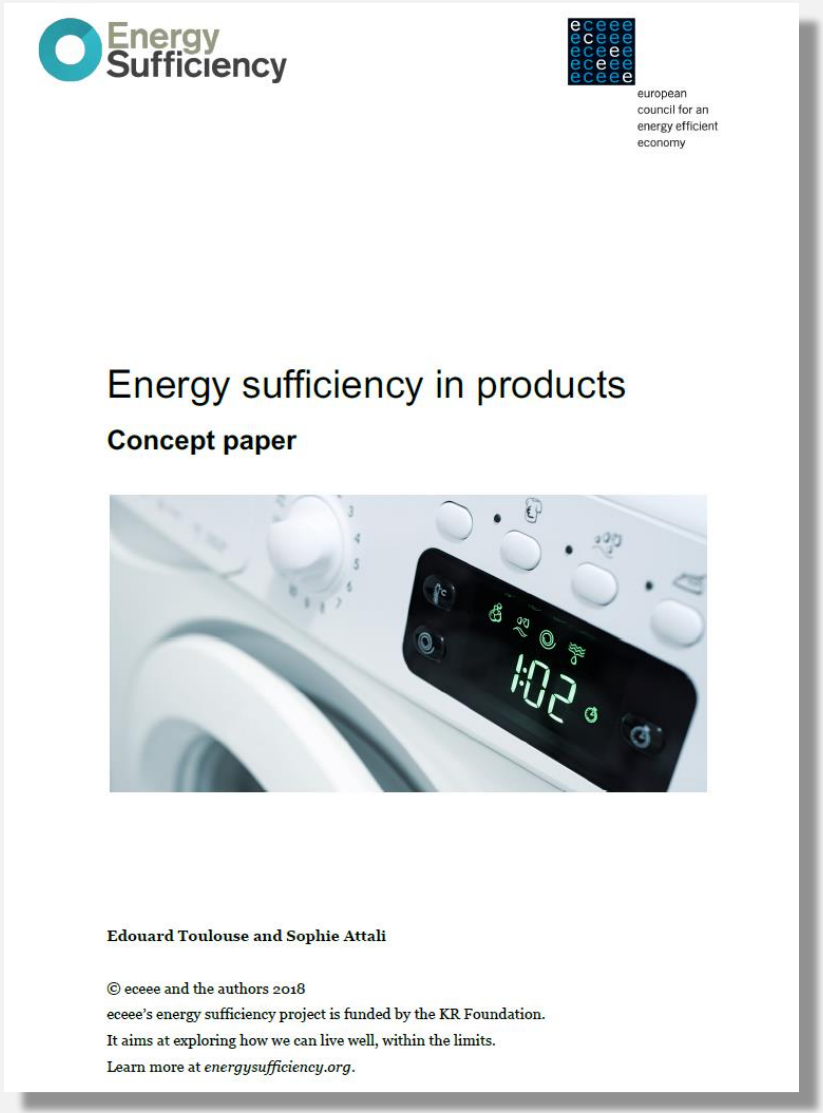
based on a decision of the German Bundestag

Modelling Energy Sufficiency in Appliances

01 Background: Sufficiency in appliances

02 Modelling in the négaWatt Scenario

03 Discussion on sufficiency assumptions

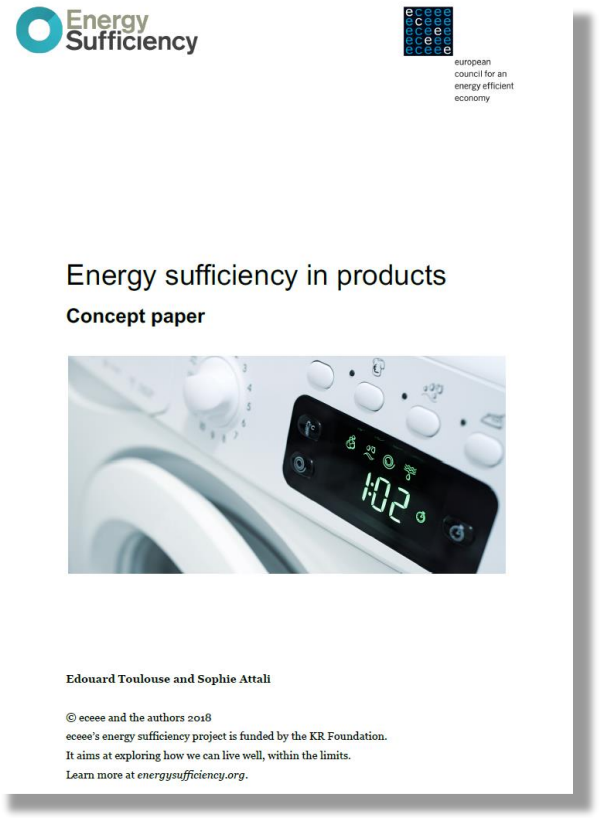


01

Background on sufficiency in appliances

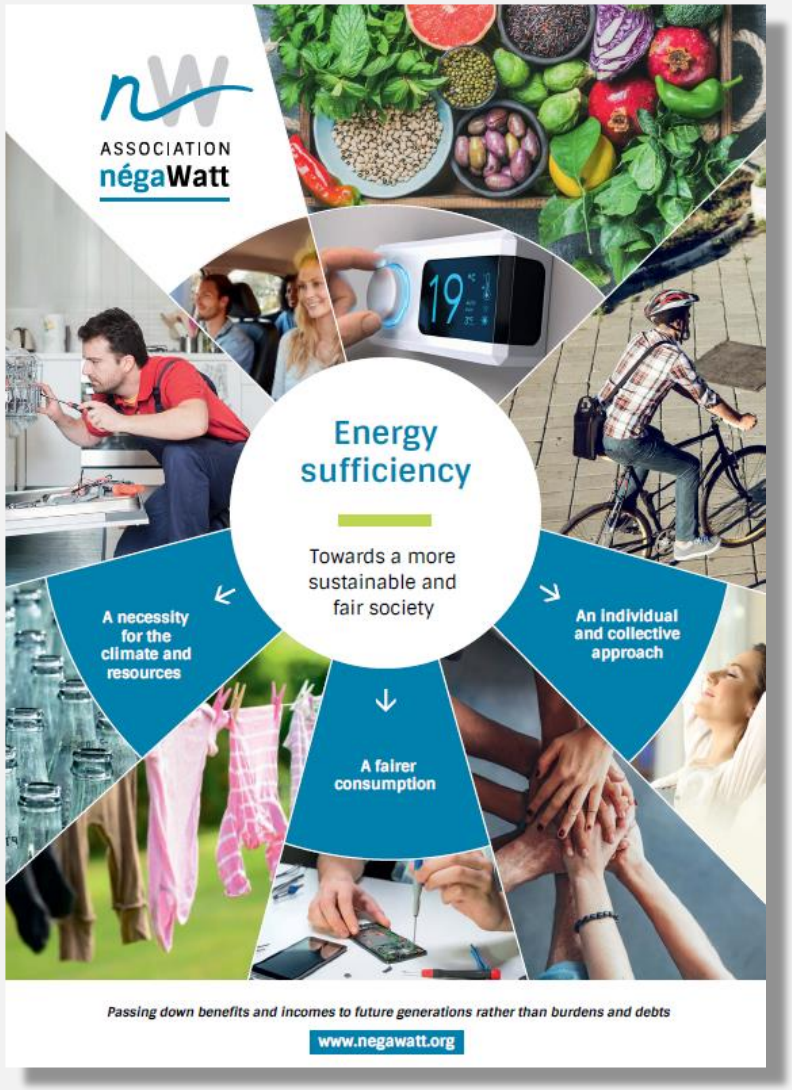
https://www.energysufficiency.org/libraryresources/library/items/energy-sufficiency-in-products-concept-paper/

Background on sufficiency in appliances



- **Definitions** of sufficiency applied to energy-using products
- **EU context** (trends in appliance ownership, usage, etc.)
- Existing **quantifications** of sufficiency potentials (micro, macro)
- **Barriers & opportunities** to sufficiency (values, social norms, routines, manufacturer strategies, new trends, co-benefits, technologies…)
- **Refined analysis** for 9 product groups at EU level

- **Sufficiency policies for appliances**: recognition, educational tools, incentives, comfort prescriptions, bans, more adequate and transparent product regulations and labels

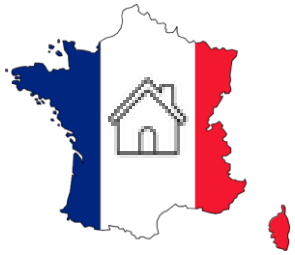


02 Appliance modelling at négaWatt

- **Detailed modelling** of appliances in the residential & tertiary sector since 2001
- **Improvements** in modelling technique over time
- **More robust field data** available since 2020

Frequent scope in energy scenarios	Scope in négaWatt scenario (France)
Heating & Cooling in buildings	
Home appliances	▪ 8 home appliances ▪ 4 home kitchen appliances ▪ 2 auxiliaries (ventilation, circulators)
Home IT	▪ 6 home IT equipment
Electric equipment in non-residential buildings	▪ 3 specific sectors (telecom, data centers, professional cold) ▪ 3 office IT equipment
Lighting	▪ Residential light sources ▪ Tertiary building light sources ▪ Street lighting

Typical modelling of an appliance category

Total energy use TWh/year =  x  x  x 

Starting point data	**National/EU statistics**	**Field measurements - surveys**	**Field measurements - market data**
Assumptions 2020-2050	**Direct assumption**	**Direct assumptions on main behavioural factors**	**Direct assumption or *Stock modelling*** *(assumptions on sales and lifetime)*

Lucky us!

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Panel Usages Electrodomestiques – Elaboration d'un service de mise à disposition de données de consommations électrodomestiques précises, fiables et actualisées annuellement

Synthèse courte – année 1

Février 2021

Etude réalisée pour le compte de l'ADEME et de RTE par : *Enertech*

PANEL ELECDOM

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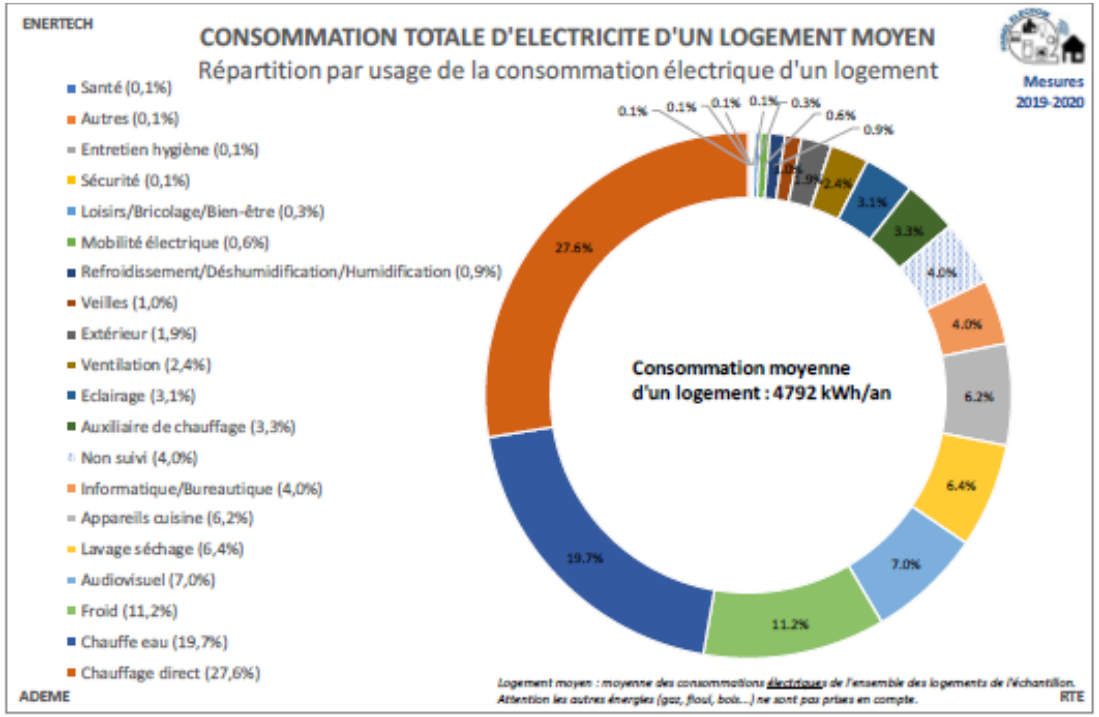
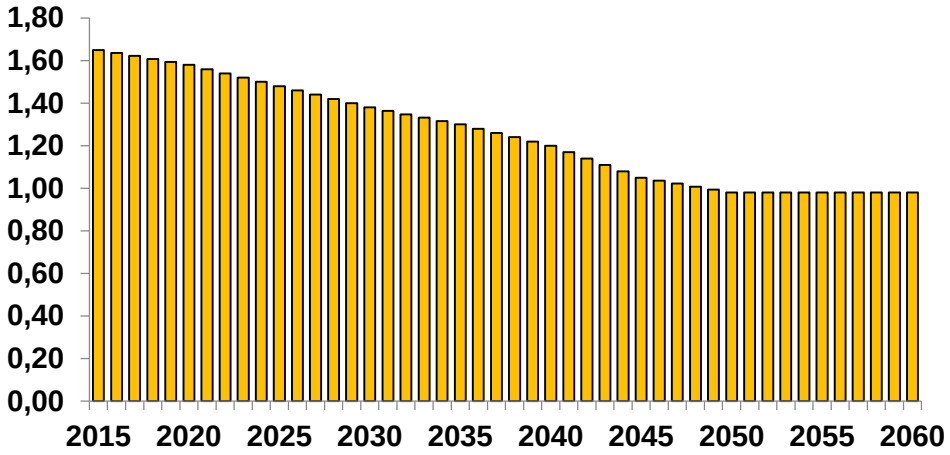
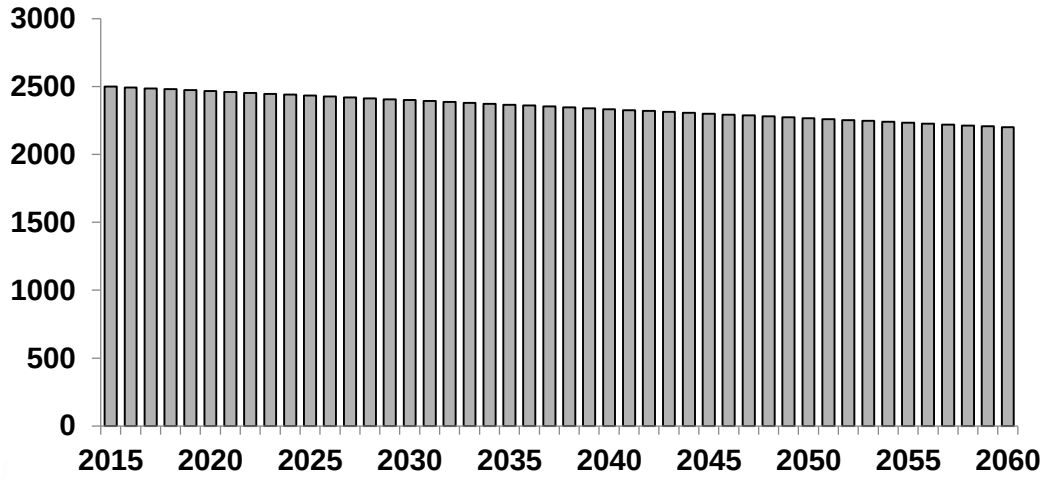


Direct assumptions

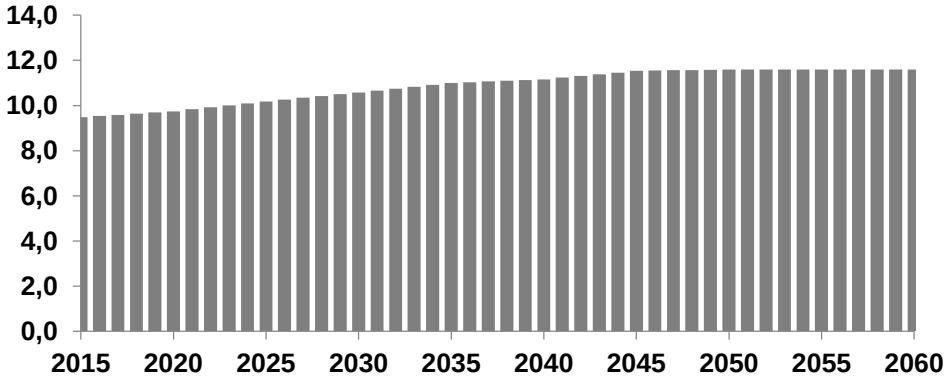
Average ownership rate



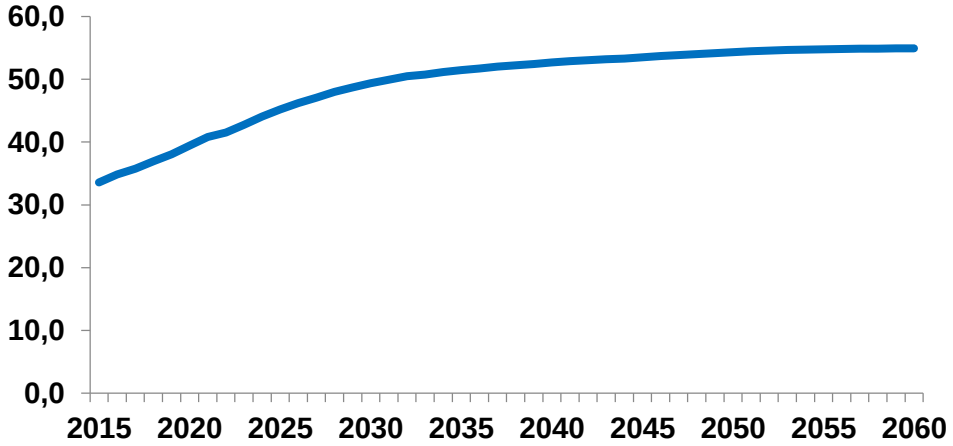
Hours of use per year



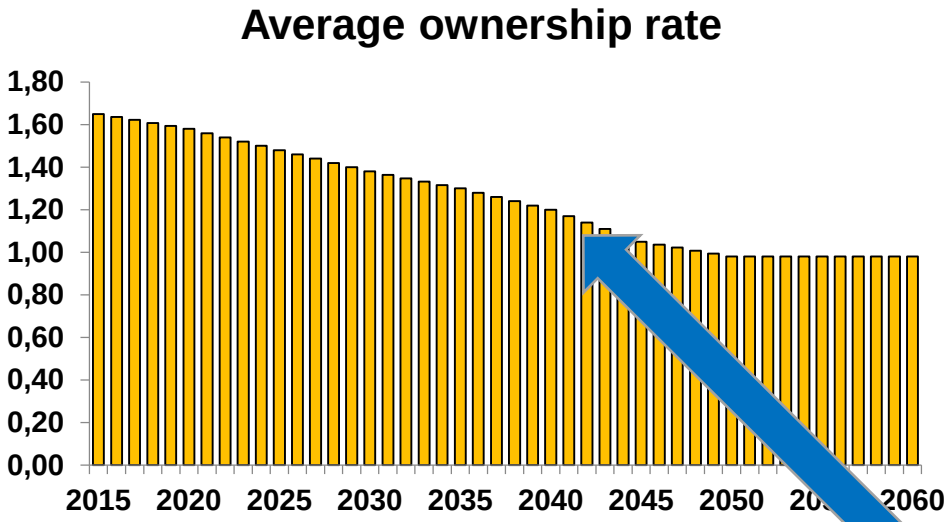
Average lifetime (years)

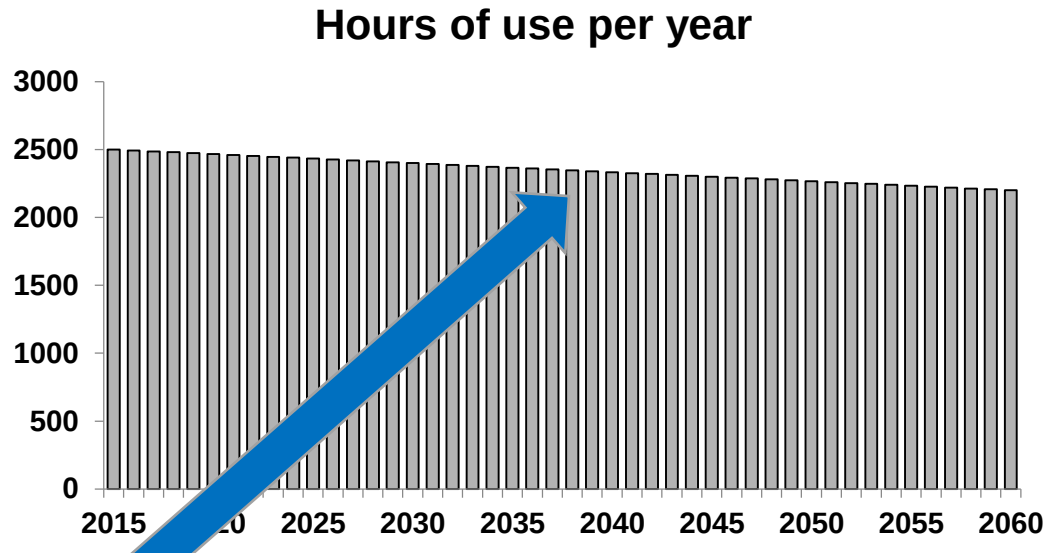


Average screen size (inch)

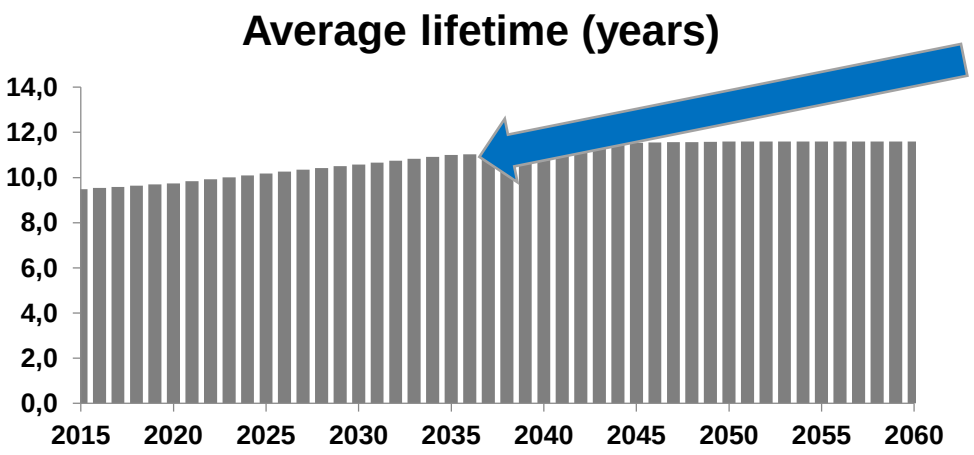


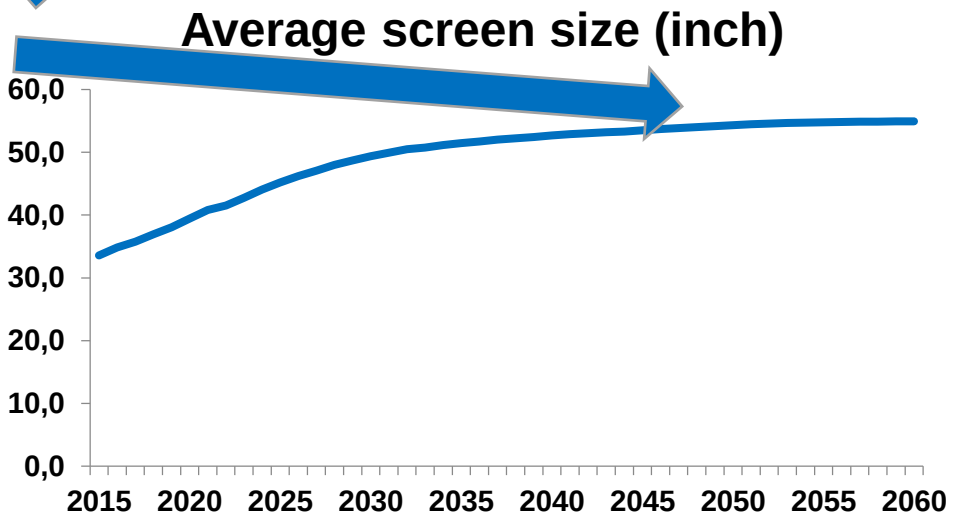
Direct assumptions



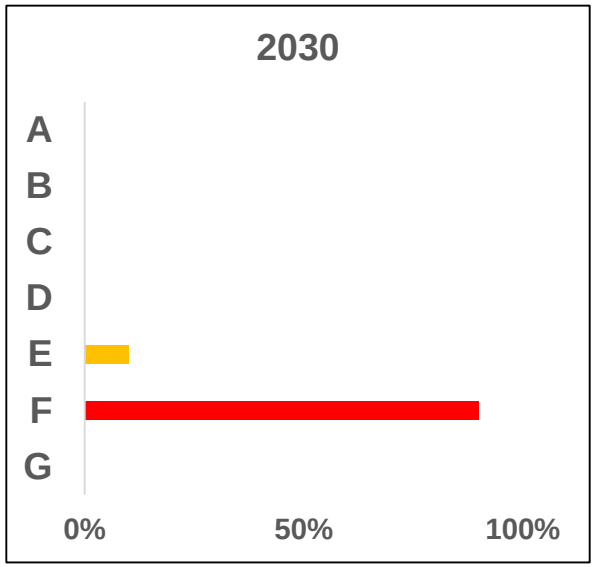


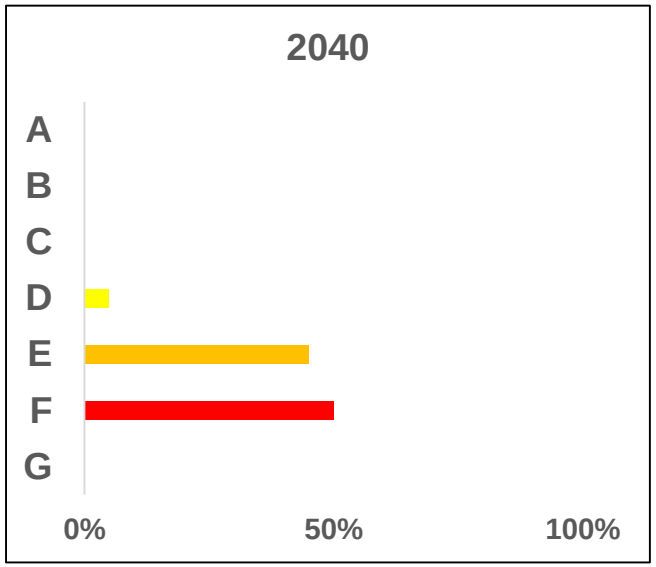
Sufficiency

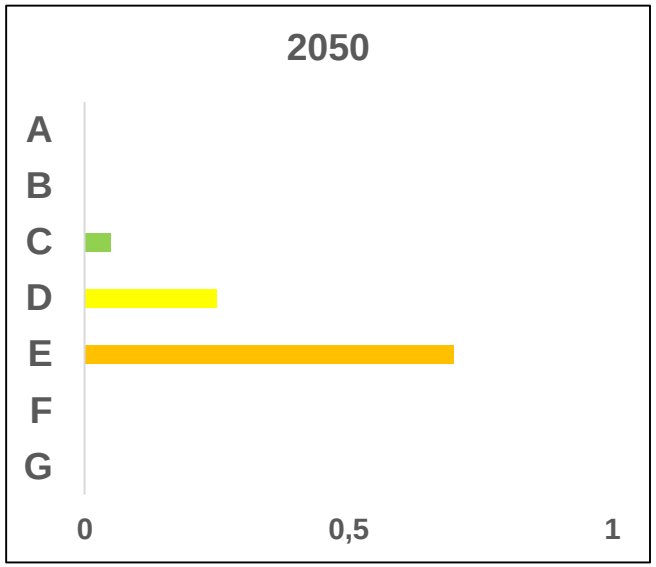


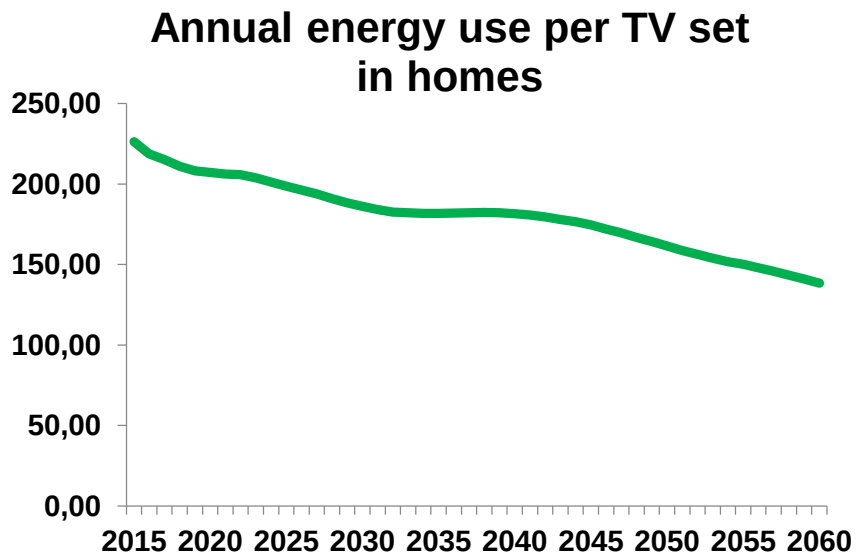


Stock modelling: assumptions on annual sales









03 Discussion on sufficiency assumptions: *what are they based on?*

- **No universal theoretical framework**
- **Case by case approach and educated estimates, but with common grounds**
- **Some driving principles:**
  - The négaWatt Vision (a more energy sufficient society)
  - Assuming sufficiency becomes an increasingly important criteria in society
  - No non-sense / completely unrealistic targets or pace

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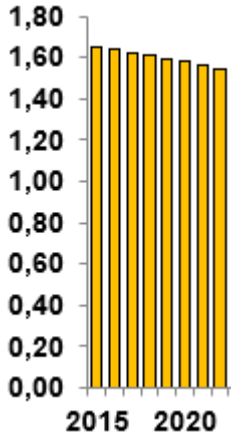
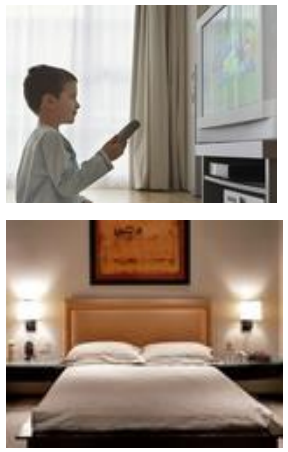


Historic trends

Technologies



Co-benefit efforts & trends

Policies & Regulations

Limits?

03 Discussion on sufficiency assumptions: *street lighting*

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Historic trends

Technologies

Co-benefit efforts & trends

Policies & Regulations

Limits?

Taking advantage of an expanding literature

EU technical studies

Preparatory studies for Ecodesign & Energy Labelling Regulations

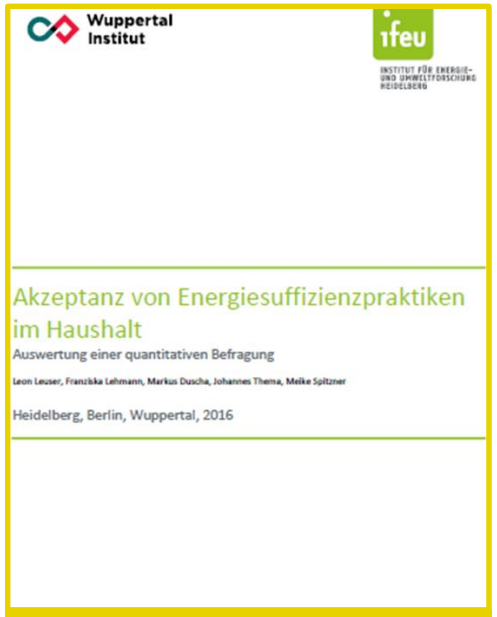
Vast collections of data on technologies, markets, standards, etc.

Manufacturer data

Data on markets and user behaviours from manufacturers and/or manufacturer & marketing associations

Research experiments

Analysis of the reasons for appliance behaviours and the drivers for change



Studies on preferences

Insights on the acceptability of sufficiency changes among the population

Thanks for your attention!