Energy efficiency in the EU

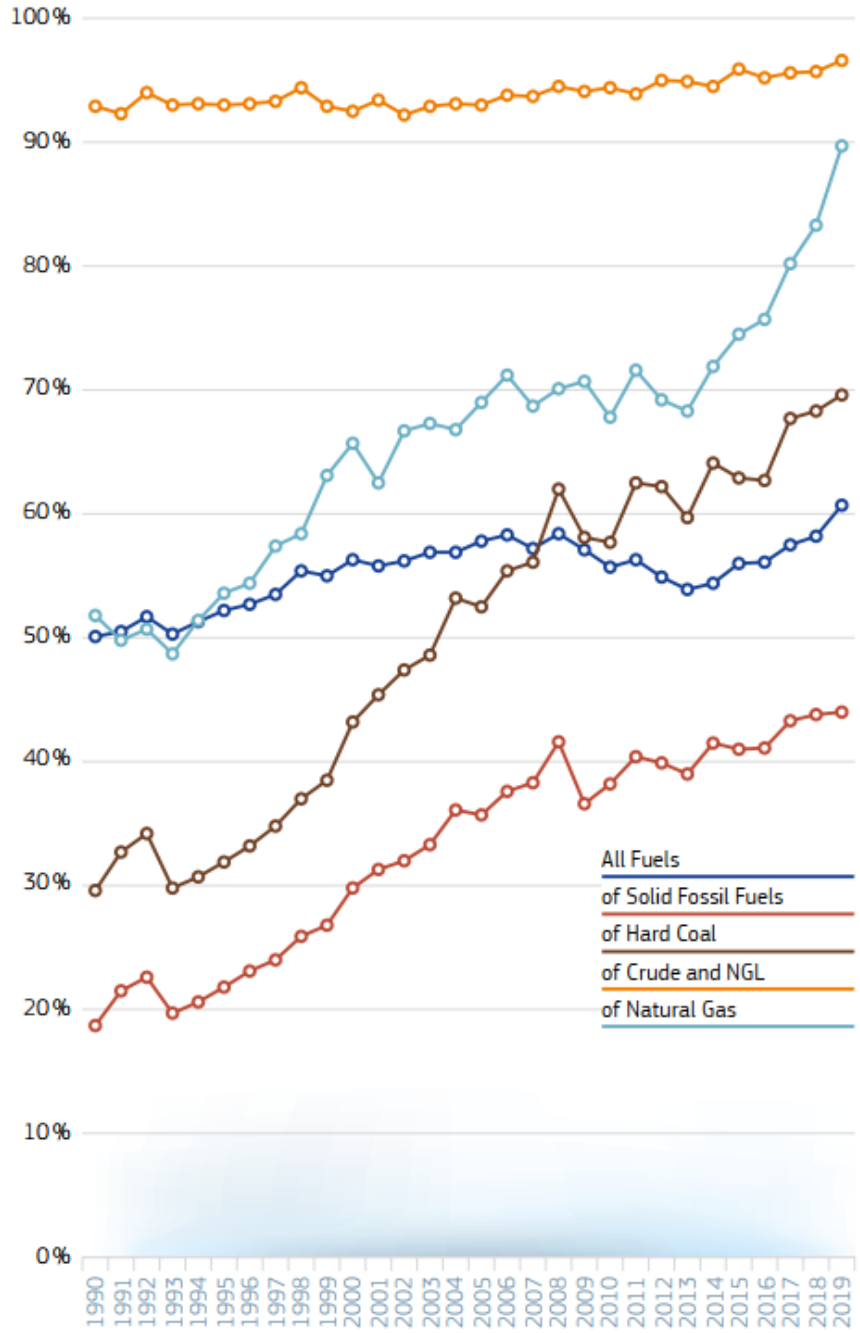
filip.cernoch@gmail.com

Energy efficiency

Consuming less is priority for the EU. **Why?**

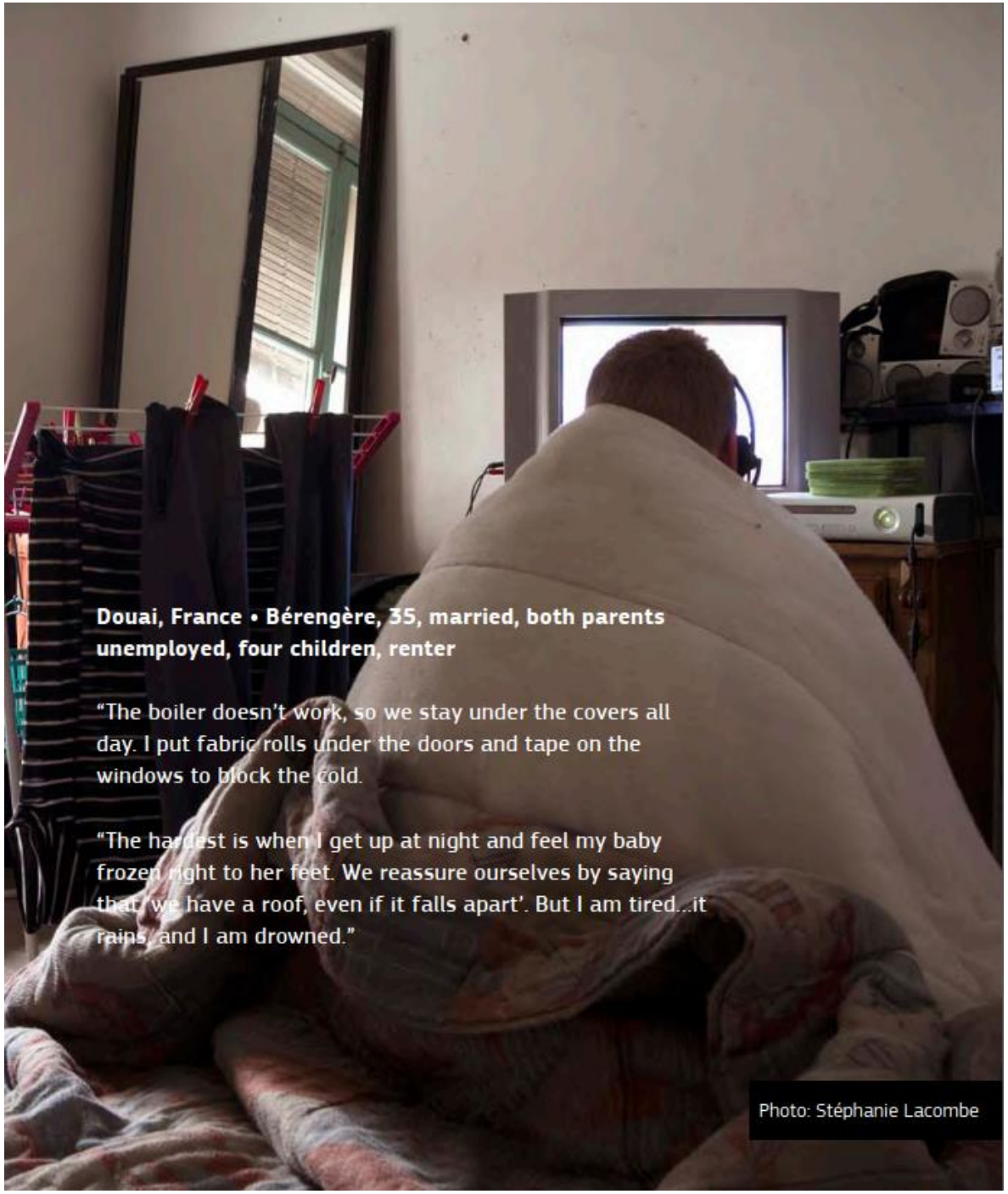
- Energy savings.
- Energy efficiency.

EU27 – import dependency



Energy poverty

Energy poverty



Energy poverty in numbers

Self-declaration:

- Struggling to keep homes warm (7,3%; 37,4 million).
- Being unable to pay utility bills on time (6,6%; 33,8 million).

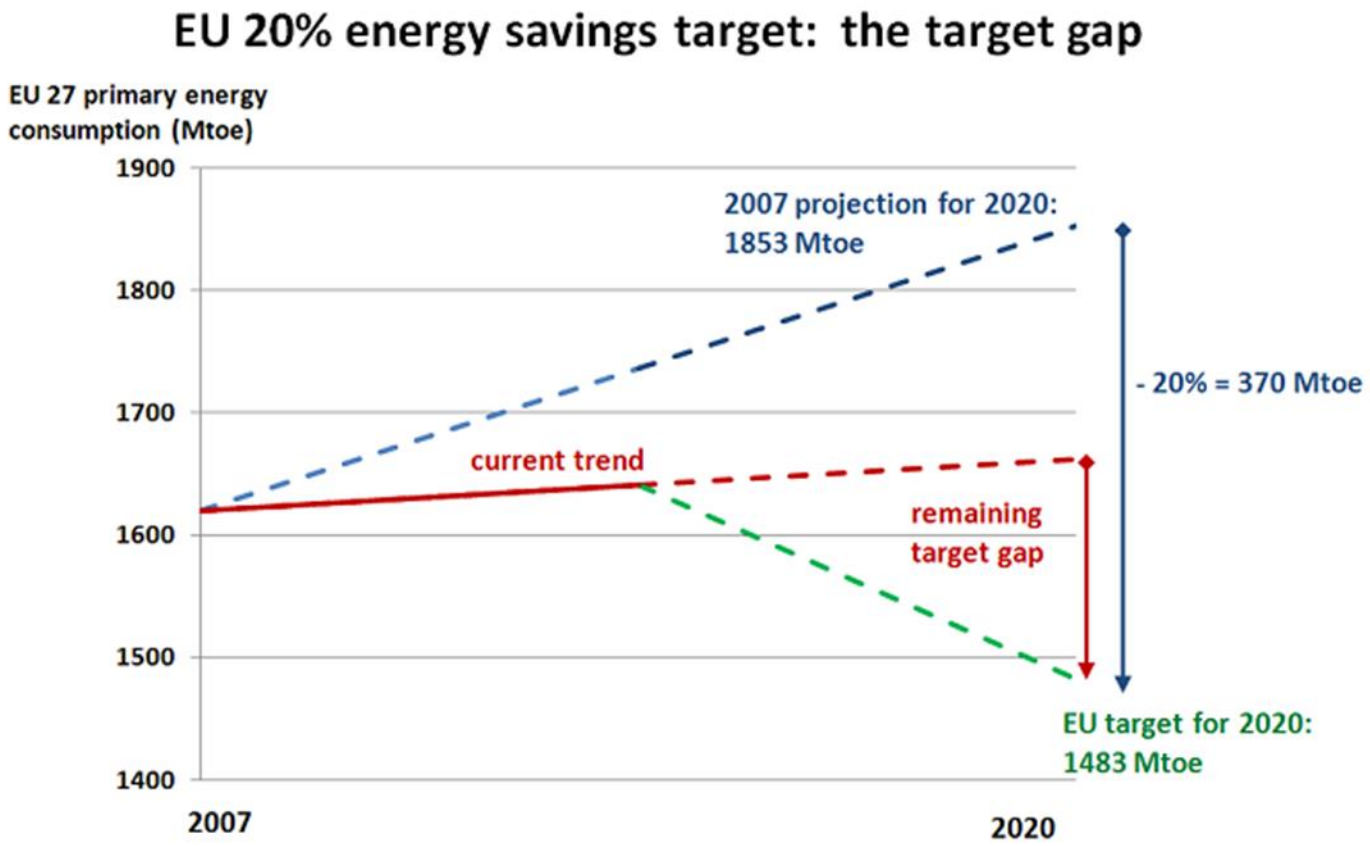
Measured:

- Having a high share of energy expenditure in income (15,5% households).
- Having abnormally low absolute energy expenditure (15,4% households).

Energy and climate package (2009)

- An energy consumption to be cut by 20% by 2020 relative to the BAU scenario, (the only) non-binding target (cap of 1483 Mtoe in 2020).
- Restriction on consumption of energy + increased energy efficiency.
- EU struggled to meet this goal, achieved only due to the Covid lockdowns in 2020. (In 2020, primary consumption in the EU 5,8% above 2020 target).

EE target calculation



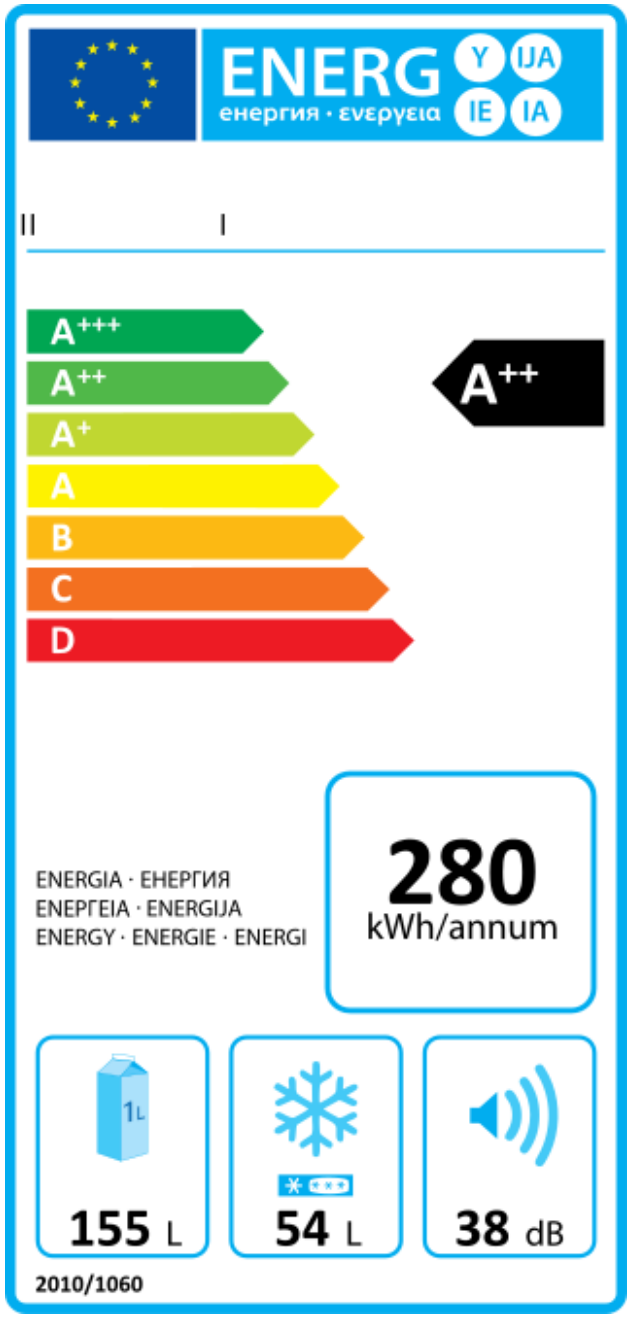
2009 Package instruments

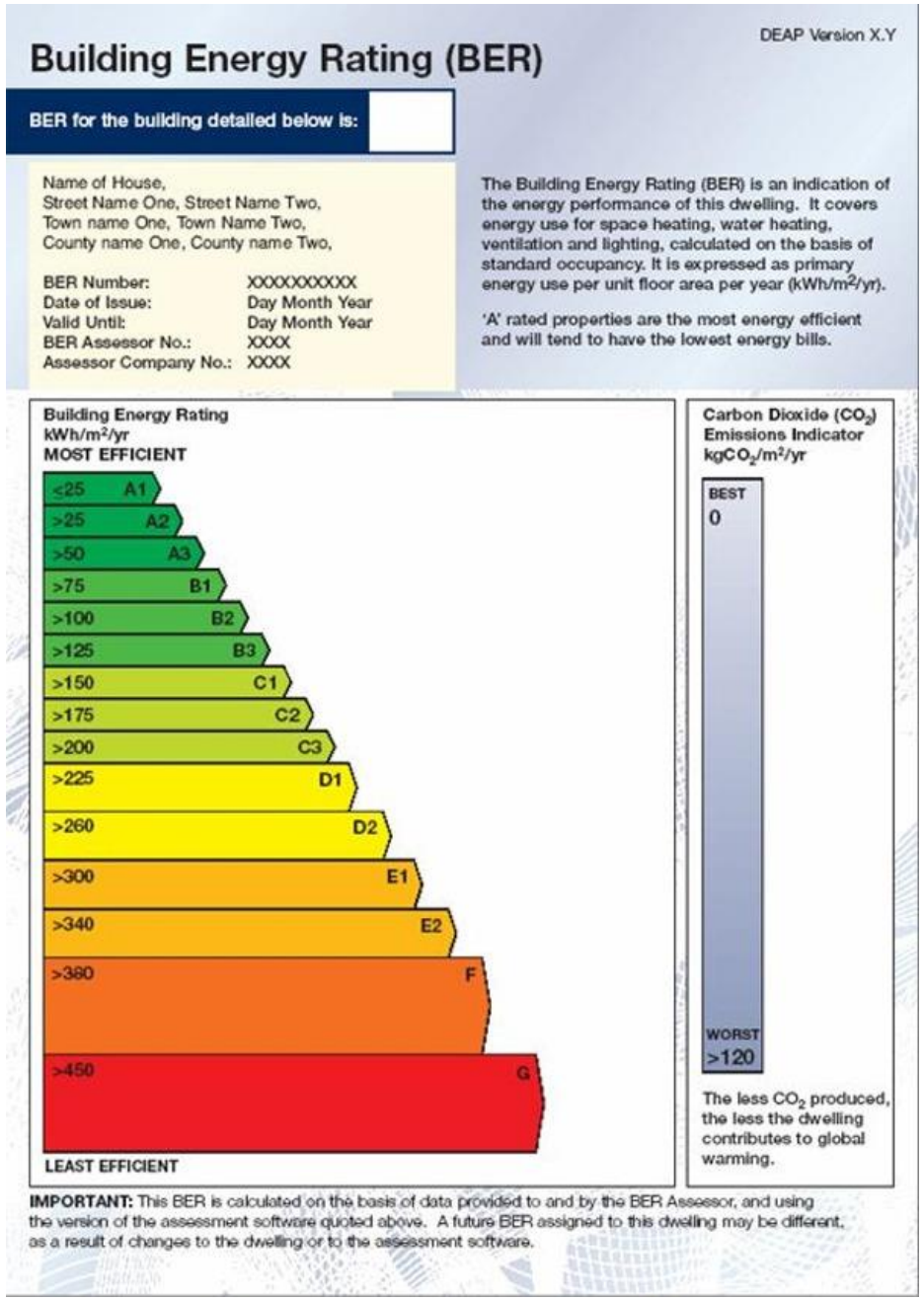
EU measures:

- Products (energy labeling, eco-design).
- Transport (measures to cut vehicle and air transportation emissions).
- Buildings (40% of all energy in the EU is consumed in building stock. Energy performance standards on new - esp. public - buildings).
- Public procurement (energy efficiency needs to be reflected when governments buy goods and services).

National measures:

- National indicative energy efficiency targets.
- National plans with national measures. (NEEAPs).


ENERG
енергия · ενεργεια
Y
IJA
IE
IA
A+++
A++
A+
A
B
C
D
A++
ENERGIA · ЕНЕРГИЯ
ЕНЕРГЕІА · ENERGIJA
ENERGY · ENERGIE · ENERGI
280
kWh/annum
155 L
54 L
38 dB
2010/1060


Building Energy Rating (BER)
DEAP Version X.Y
BER for the building detailed below is:
Name of House,
Street Name One, Street Name Two,
Town name One, Town Name Two,
County name One, County name Two,
BER Number: XXXXXXXXX
Date of Issue: Day Month Year
Valid Until: Day Month Year
BER Assessor No.: XXXX
Assessor Company No.: XXXX
The Building Energy Rating (BER) is an indication of the energy performance of this dwelling. It covers energy use for space heating, water heating, ventilation and lighting, calculated on the basis of standard occupancy. It is expressed as primary energy use per unit floor area per year (kWh/m²/yr).
'A' rated properties are the most energy efficient and will tend to have the lowest energy bills.
Building Energy Rating
kWh/m²/yr
MOST EFFICIENT
<25 A1
>25 A2
>50 A3
>75 B1
>100 B2
>125 B3
>150 C1
>175 C2
>200 C3
>225 D1
>260 D2
>300 E1
>340 E2
>380 F
>450 G
LEAST EFFICIENT
Carbon Dioxide (CO2) Emissions Indicator
kgCO2/m²/yr
BEST
0
WORST
>120
The less CO2 produced, the less the dwelling contributes to global warming.
IMPORTANT: This BER is calculated on the basis of data provided to and by the BER Assessor, and using the version of the assessment software quoted above. A future BER assigned to this dwelling may be different, as a result of changes to the dwelling or to the assessment software.

Directive 2012/27/EC (EED I)

- Developed to reach 20% target savings.
- Binding measures, not binding targets.
- MS are required to:
  - Set national targets in line with the overall EU target of 20%.
  - Evaluate the situation in national heating and cooling systems, suggest some cost-effective measures to improve them (every 5 years).
  - The same for gas and electricity infrastructure.
  - Oblige energy providers to achieve cumulative end-use energy savings by 2020 equivalent to 1,5% of annual energy sales over the period of 2014-2020, against scenario. (Energy performance contracting).

Directive 2012/27/EC (EED I)

- Introduce the metering and billing of actual energy consumption in all sectors – to provide consumers with data.
- Prepare public procurement rules ensuring that central governments purchase only high-efficiency products.
- Large industry enterprises to carry out an energy audits at least every four years. Audits for SME must be promoted by governments.
- Increasing attention given to appliances.
- Buildings – new buildings and buildings under renovation to be „nearly zero energy“ by the end of 2020. To improve the energy performance of 3% of the total floor area of heated and/or cooled buildings owned and occupied by the central government every year.

Directive 2018/2001/EU (EED II)

- 2018 – revision of Energy Efficiency Directive – collective EU binding target of 32.5% by 2030. (Part of CEP package).
- Each MS obliged to prepare a 10-year integrated National energy and climate plan (NECP) for 2021 – 2030.
  - Emphasis on metering an billing to give consumers signals to save.
  - Transparent rules on the allocation of the costs of heating, cooling and hot water in multiapartment buildings.
  - Increased efficiency of electricity production.
  - And others, in line with previous versions.

Fit for 55 package

- Binding EU target of 36% by 2030 (instead of 32,5%).

Energy efficiency gap

= A gap between energy efficiency policies potential and effective achievements.

= EE barriers: „A mechanism that inhibits a decision or a behaviour that appears to be both energy efficient and economically efficient“.

EE barriers

Ratings of the most relevant barriers by Country. Notes: bold numbers represent the three highest scores within each Country. "BU": Bulgaria; "GE": Germany; "GR": Greece; "UK": United Kingdom; "ES": Estonia; "IT": Italy; "BL": Belgium; "SE": Serbia.

Building sector

Scores of the most relevant barriers by Country and in total

		BU	GE	GR	UK	ES	IT	BE	SE	Total
Economic	**Socio-economic status of building users**	92 %	67 %	95 %	55 %	96 %	71 %	64 %	84 %	78 %
	Lack of funds, high capital costs, financial risk	58 %	50 %	85 %	68 %	79 %	50 %	48 %	76 %	67 %
	Limited payback expectations / investment horizons	42 %	50 %	45 %	76 %	58 %	50 %	48 %	24 %	47 %
	Building stock characteristics	42 %	25 %	20 %	52 %	46 %	29 %	56 %	60 %	45 %
	Split incentive	8%	33 %	50 %	57 %	30 %	36 %	60 %	44 %	43 %
Institutional	Complex/inadequate regulatory procedures	67 %	42 %	55 %	48 %	26 %	57 %	33 %	51 %	46 %
	Lack of relevant legislation	33 %	17 %	50 %	76 %	17 %	23 %	32 %	39 %	37 %
	Training and skills of professionals	25 %	33 %	50 %	43 %	33 %	36 %	40 %	31 %	37 %
Behavioural	**Customs, habits and relevant behavioural aspects**	33 %	58 %	30 %	76 %	46 %	36 %	64 %	50 %	51 %
	Lack of awareness on saving potentials	50 %	33 %	60 %	38 %	46 %	71 %	44 %	54 %	50 %
	Lack of interest and undervaluing EE	25 %	42 %	60 %	64 %	40 %	57 %	35 %	50 %	47 %
	Lack of trusted information and experience	67 %	17 %	55 %	55 %	25 %	64 %	28 %	35 %	41 %

EE barriers

Ratings of the most relevant barriers by Country. Notes: bold numbers represent the three highest scores within each Country. “BU”: Bulgaria; “GE”: Germany; “GR”: Greece; “UK”: United Kingdom; “ES”: Estonia; “IT”: Italy; “BL”: Belgium; “SE”: Serbia.

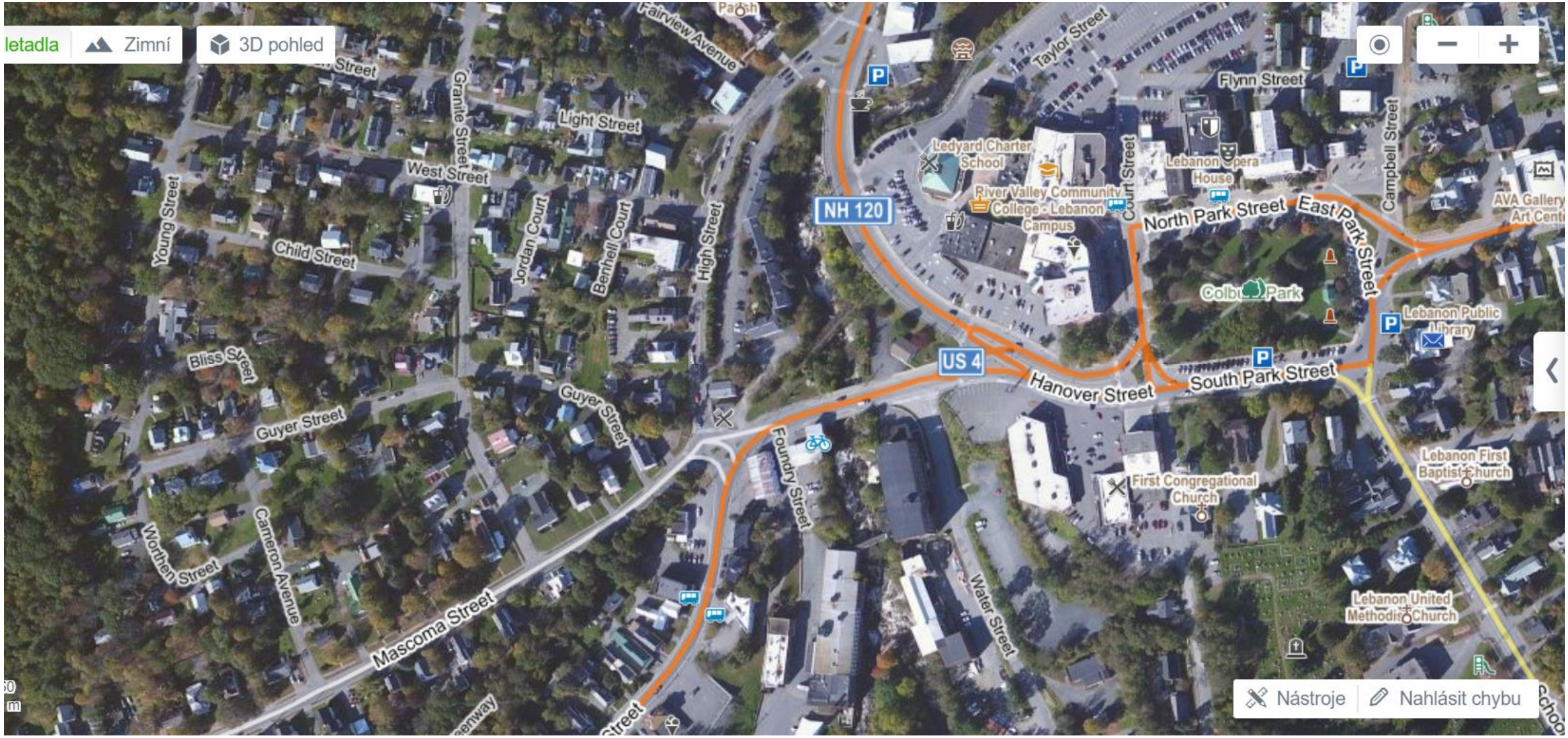
Transport sector

Scores of the most relevant barriers by Country and in total

		BU	GE	GR	UK	ES	IT	BE	SE	Total
Economic	**Lack of finance for new vehicles/public transport**	100 %	38 %	82 %	60 %	85 %	62 %	37 %	84 %	71 %
	Low purchasing power of consumers / financial crisis	100 %	13 %	82 %	57 %	69 %	77 %	42 %	76 %	67 %
Institutional	**Limited infrastructure investment**	92 %	75 %	65 %	57 %	65 %	54 %	79 %	84 %	72 %
	Inefficient transport infrastructure and planning	50 %	75 %	65 %	79 %	58 %	54 %	74 %	68 %	65 %
	No national strategy for sustainable urban mobility	42 %	63 %	76 %	43 %	58 %	62 %	84 %	56 %	61 %
	Lack of integrated governance	58 %	71 %	47 %	64 %	65 %	23 %	89 %	52 %	59 %
	Lack of cycling/walking infrastructure	58 %	63 %	59 %	57 %	46 %	54 %	74 %	64 %	59 %
	Lack of rail transportation/infrastructure	67 %	25 %	71 %	57 %	42 %	54 %	53 %	80 %	58 %
	Transport EE on the Government agenda lacking / underrepresented	50 %	50 %	59 %	64 %	50 %	38 %	47 %	60 %	53 %
	Lack of infrastructure for recharging of electric vehicles	75 %	38 %	59 %	50 %	8%	46 %	63 %	68 %	50 %
Behavioural	Low satisfaction with public transport/lack of trust	42 %	63 %	47 %	73 %	65 %	29 %	84 %	54 %	59 %
	Environmental concern / low priority	33 %	38 %	41 %	57 %	52 %	31 %	63 %	60 %	50 %


Divadlo
Reduta
Restaurace Špalíček


195 S Main St
Lebanon, New Hampshire
Google
Street View – čvc 2019
KFC
TACO BELL
S Main St
J. Maxx
Market St
L.L.Bean
Glen Rd
Google
Pořízení obrázku: čvc 2019
© 2022 Google
Spojené státy
Smluvní podmínky
Ochrana soukromí
Nahlásit problém


letadla
Zimní
3D pohled
Fairview Avenue
Granite Street
Light Street
West Street
Young Street
Child Street
Jordan Court
Benhell Court
High Street
Taylor Street
Flynn Street
Campbell Street
Ledyard Charter School
River Valley Community College - Lebanon Campus
Court Street
Lebanon Opera House
NH 120
North Park Street
East Park Street
Colbu Park
Lebanon Public Library
US 4
Hanover Street
South Park Street
Bliss Street
Guyer Street
Foundry Street
First Congregational Church
Lebanon First Baptist Church
Worthen Street
Cameron Avenue
Mascoma Street
Water Street
Lebanon United Methodist Church
Nástroje
Nahlásit chybu

Billings Farm Road
Christian Street
Christian Street
Hartford Avenue
Woodhaven Drive
Kacey Drive
Dobhan Brook
Hazen Trail
Backwater
Hartford
Nástroje
Nahlásit chybu

Buildings

- Buildings in TFC 37.5%, energy related CO2 emissions 17%. (2017)
- 11% oil, 34% natural gas, 2% coal, 33% elektricity, 11% bioenergy and waste, 7% district heating (2017).
- Energy consumption stable in the last decade.
- EPBD (Directive 2018/844) – acceleration of the renovation of existing buildings, modernisation of the smartness of all buildings = starting 2021 all new buildings in the EU nearly zero-energy.

Transport

- Share in TFC 28%.
- 64% diesel, 24% gasoline, 5% biofuels, 2% LPG, 2% jet-type kerosene, 2% electricity, 1% natural gas. Marginal decrease in the last decade.
- Binding CO_2 emission targets for all categories of road vehicles, furthering EV dissemination.
  - (from 2021 95 g CO_2 /km for passenger cars….)
- National energy efficiency obligation schemes on fuel suppliers, retailer or distributors.
- Rules on aerodynamic performance of vehicles, energy labes for tyres…

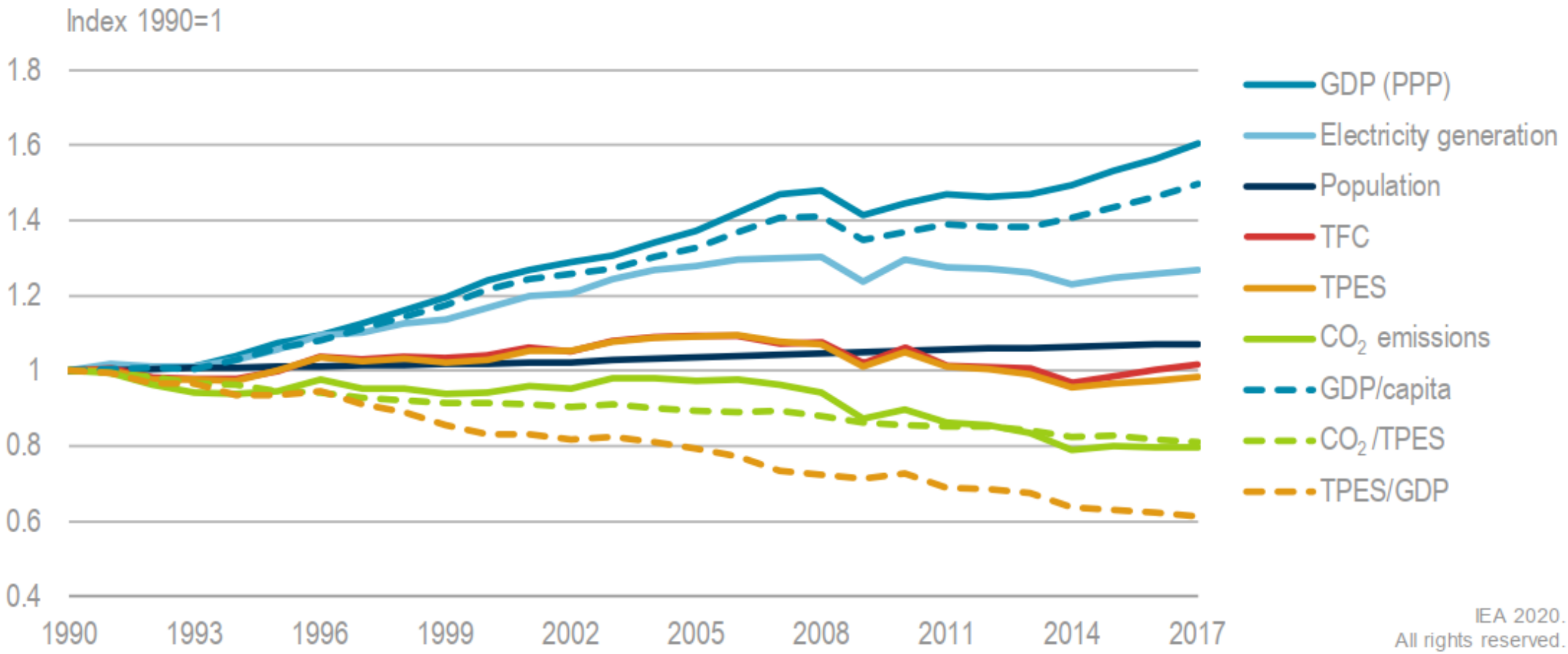
- Support for railway transport (incl. electrification).
- Infrastructure for alternative (clean) vehicles.

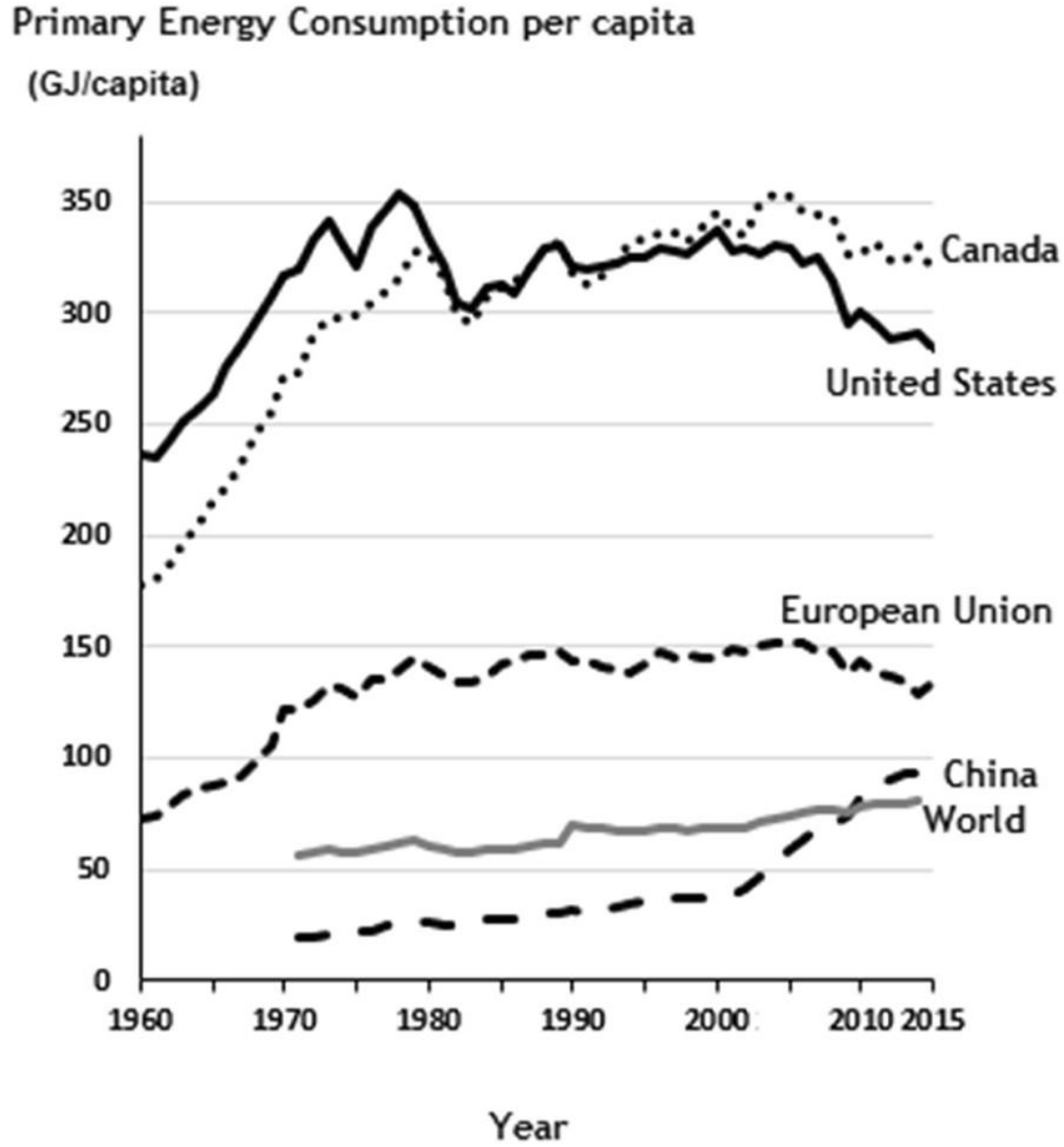
Industry

- 31% oil, 27% natural gas, 24% electricity, 7% bioenergy and waste, 7% coal, 4% district heating (2017).
- Share in TFC 32% (2017).
- EU ETS with free allowances for exposed sectors.
- EED I required large enterprises to carry out energy audits and encouraged to put in place ISO 50001 standards.
- Standards on motors, industrial pumps, industrial fans, etc.

„Energy Efficiency First“ (CEP)

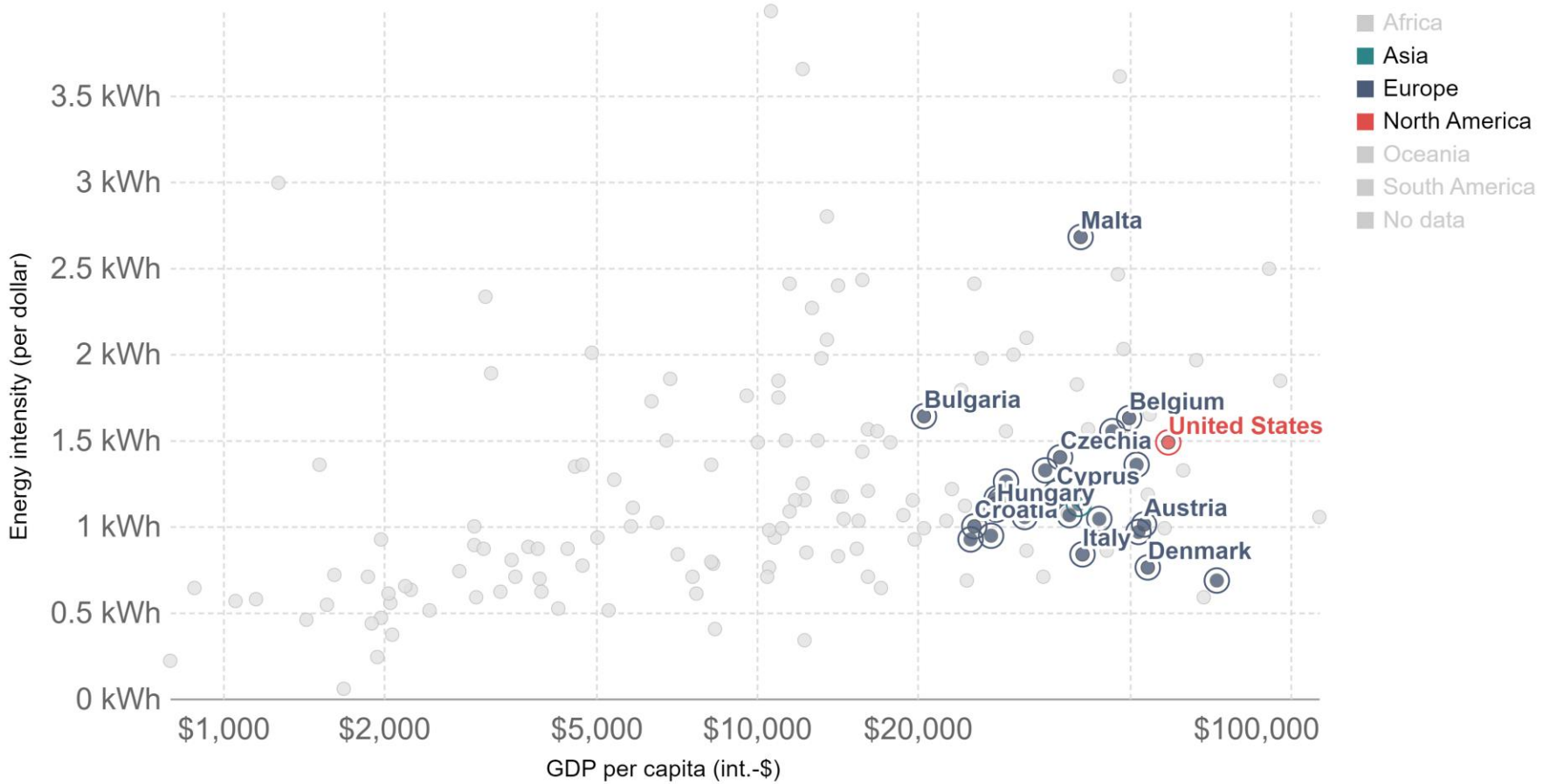
EU energy and climate indicators




Primary Energy Consumption per capita
(GJ/capita)
350
300
250
200
150
100
50
0
1960
1970
1980
1990
2000
2010
2015
Canada
United States
European Union
China
World
Year

Energy intensity vs. GDP per capita, 2016

Energy intensity represents energy consumption per unit of GDP – it's measured in kilowatt-hours per international-$.



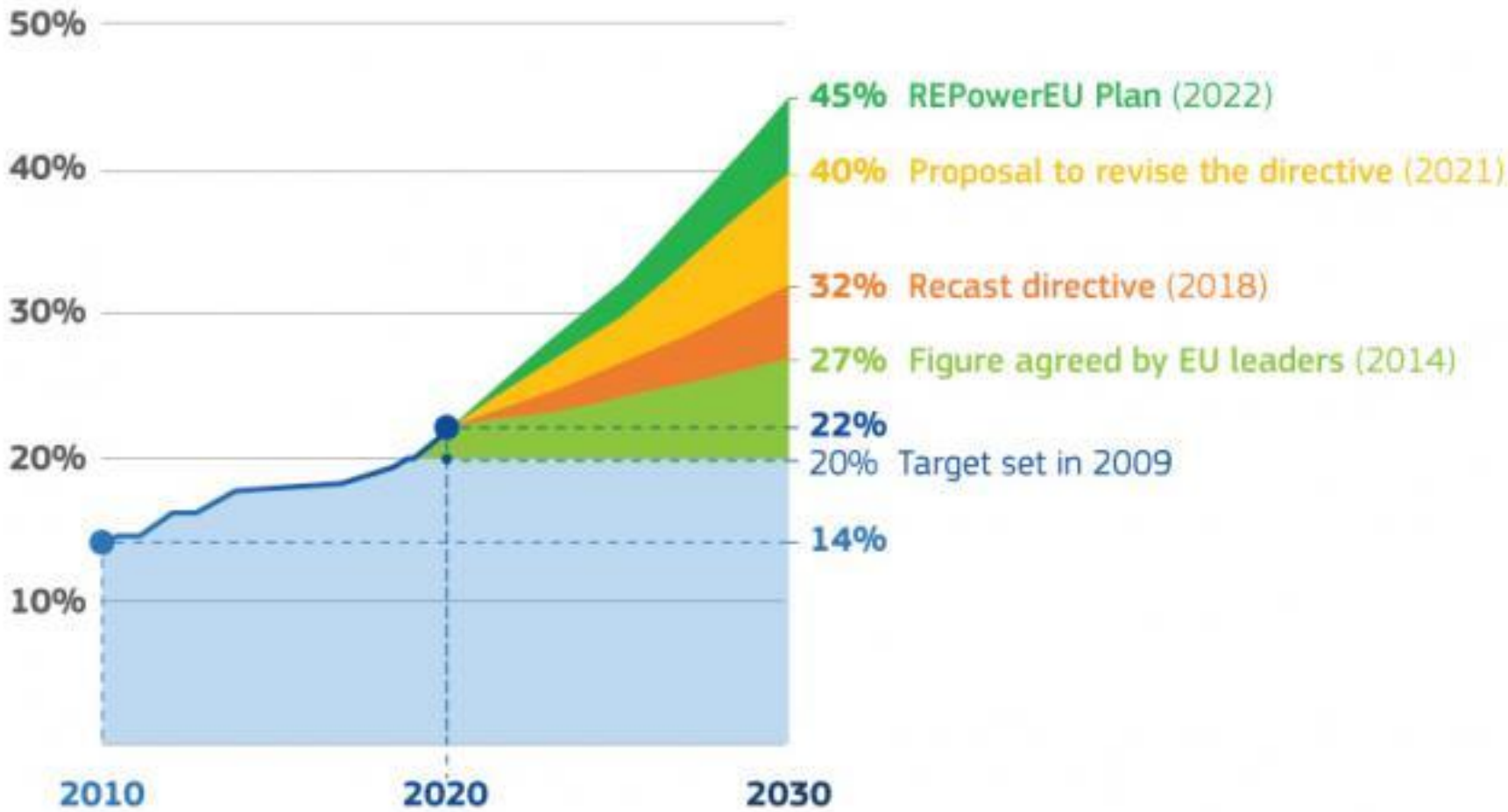
Source: Our World in Data based on BP; Shift Energy; UN Population & Maddison Database, Data compiled from multiple sources by World Bank

Note: GDP per capita is measured in constant international-$ which corrects for inflation and cross-country price differences.

Challenges

- Jevons paradox
- Price of energy vs. EE

Evolution of renewable energy targets



Sources

- Saundry, P.D.(2019): Review of the United States energy system in transition.