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a) Observed global temperature change and modeled responses to stylized anthropogenic emission and forcing pathways

Global warming relative to 1850-1900 (°C)



IPCC 2018













Time-series of climate-related human activities

Ripple et al. 2024



Timeseries of climate-related responses



The Nordic countries – green transition leaders?



COUNTRY	RANK	SCORE	10y 🛆
Estonia	1	75.7	17.6
Luxembourg	2	75.1	4.2
Germany	3	74.5	4.6
Finland	4	73.8	8.3
United Kingdom	5	72.6	2.1
Sweden	6	70.3	1.6
Norway	7	69.9	3.7
Austria	8	68.9	-0.3
Switzerland	9	67.8	2.0
Denmark	10	67.7	1.8

Environmental Performance Index



https://epi.yale.edu/measure/2024/EPI

The most affluent but the most environmentally sustainable?

MAP (2024)

● 25,000 or more ● 10,000 - 25,000 ● 2,500 - 10,000 ● 500 - 2,500 ● under 500 ● no data





LIST (2024)				
Country	Region	Analytical group		
Country			Val	u
Luxembour	g		135.32 thousar	۱d
Switzerland			106.1 thousar	۱d
Ireland			103.5 thousar	۱d
Norway			90.43 thousar	۱d
Singapore			89.37 thousar	۱d
United State	es		86.6 thousar	۱d
Iceland			85.79 thousar	۱d
Macao SAR			77.19 thousar	۱d
Qatar			71.57 thousar	۱d
Denmark			69.27 thousar	۱d
Netherland	S		67.98 thousar	۱d
Australia 📖			65.97 thousar	۱d
San Marino			59.84 thousar	۱d
Austria			58.67 thousar	۱d
Sweden			57.21 thousar	۱d

IMF, 2024



Carbon footprints in selected countries from a consumption perspective



Clarke et al. (2017), Journal of Cleaner Production



"One planet boundary" compared to these same consumptionbased footprints



Clarke et al. (2017), Journal of Cleaner Production



Current carbon footprints

1.5 degree compatible carbon footprint



https://carbonfootprint.hi.is/

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Check your carbon footprint, learn how to reduce it, and contribute to climate change research.





The footprint levels: Denmark the highest at 7.6 t





Denmark

The footprint levels: Sweden the lowest at 4.8 t





The"limit values" as intensities at different levels of consumption

Per monetary unit GHG intensity of consumption compared to the 3600 kg CO_2e and 2500 CO_2e targets



Annual consumption expenditure per capita (€)

~~3600

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The intensities decline along with income, remain above the target



Heinonen et al. 2022

Climate concern motivates action, but not to the extent need





Árnadóttir et al. 2024

Low climate-literacy – unjust climate-sustainability perception



Fig. 1. Carbon footprints in consumption categories and household income deciles per capita by the level of climate-sustainability perception in Nordic countries.





The issue very poorly understood but destroying most mitigation schemes is called the rebound effect



When not driving, one tends to fly more



Czepkiewicz et al. 2019

Driving has high GHG reduction potential – but is also expensive

The impact of giving up on the car



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Direct reduction



...thus having a high rebound potential as well

The impact of re-spending the saved money



The majority of the costs are often related to owning and maintaining the car



The impact of reducing mileage

Direct reduction potential

...reduced driving thus having significantly lower rebound-potential





The impact of re-spending the saved money



Ottelin et al., 2017

An interesting overall implication is that the non-motorized might not have the smallest carbon footprints





Ottelin et al., 2017

The same applies across the Nordic countries





Bensín eða utanlandsferð? e-Golf 100% rafmagnaður.

₩ AZ # A55

Think Blue.



The key issue is that we should be ready to pay for environmentally sustainable choices, not try to save money through them





No car & No flights

Derived from Heinonen et al. 2022



tCO_2e Income decile Housing energy Vehicle Use Local travel Food Goods & services Pets Summer houses Leisure travel Current limit 2030 limit

Vegan/Vegetarian & No car

Derived from Heinonen et al. 2022



But instead of pushing our societies towards environmentally sustainable lifestyles,

we try to label our continuous search for economic growth with a sustainability label

to avoid admitting that there are limits to growth

Mall of Tripla, Helsinki – LEED Platinum





New dense city development outside Tripla





A BREEAM vs. a conventional building in Reykjavik



Green Building Council Iceland, 2023







PERSPECTIVE



NATURE SUSTAINABILITY



Churkina et al. 2020

Thank youl

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