

How to start off on the right foot?

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University of Ljubljana

2 basic goals of the project

- Change the energy mix (more RE)
- Consume less energy

General approach various methods



Let us try
to use the same
blocks

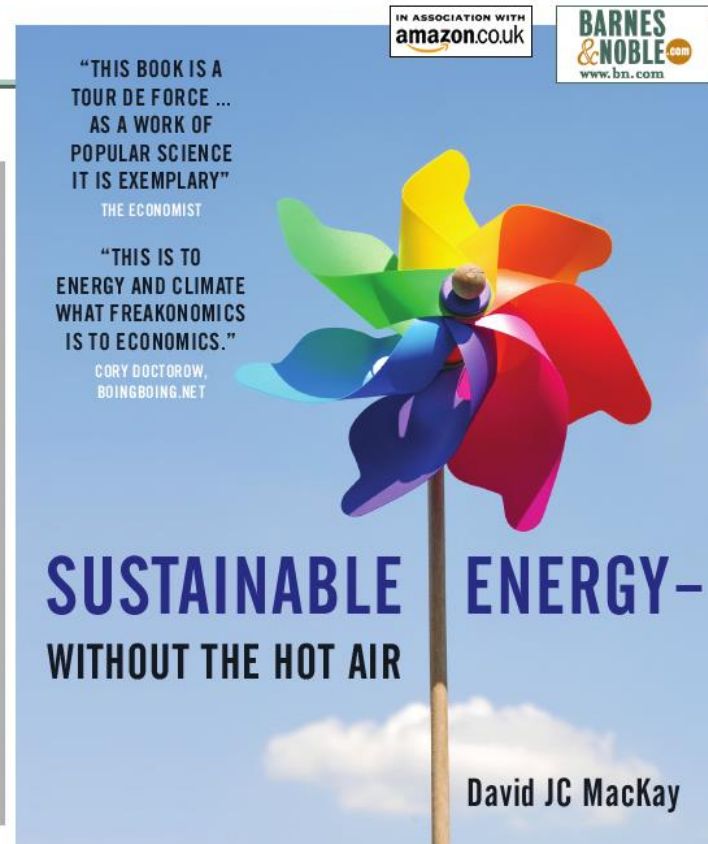
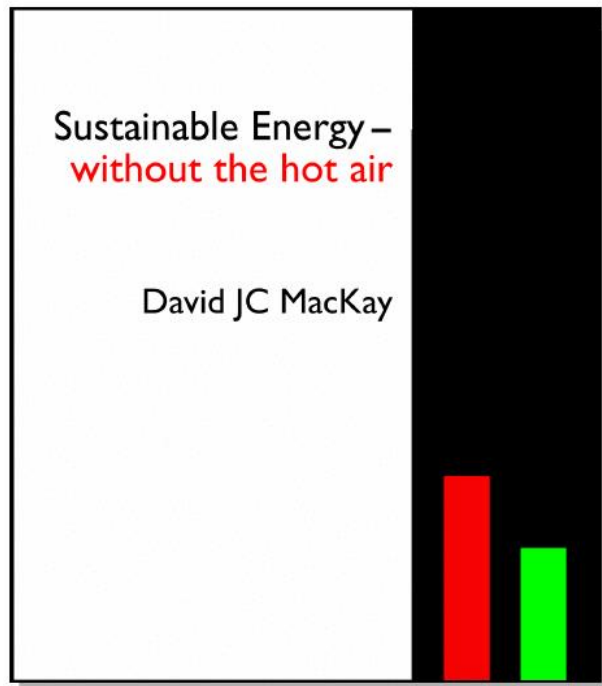


... for different results



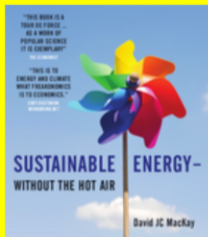
Update your energy knowledge

This book is free online



Translations exist: Italian, French, Slovene...

Sustainable Energy – without the hot air



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"For anyone with influence on energy policy, whether in government, business or a campaign group, this book should be compulsory reading."

Tony Juniper
Former Executive Director, Friends of the Earth

"At last a book that comprehensively reveals the true facts about sustainable energy in a form that is both highly readable and entertaining."

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EDF Energy

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We need the same energy units

How to express energy consumption/savings

- CO2 footprint
- Toe? Tonne of oil oil equivalent
- GigaJoules
-
-

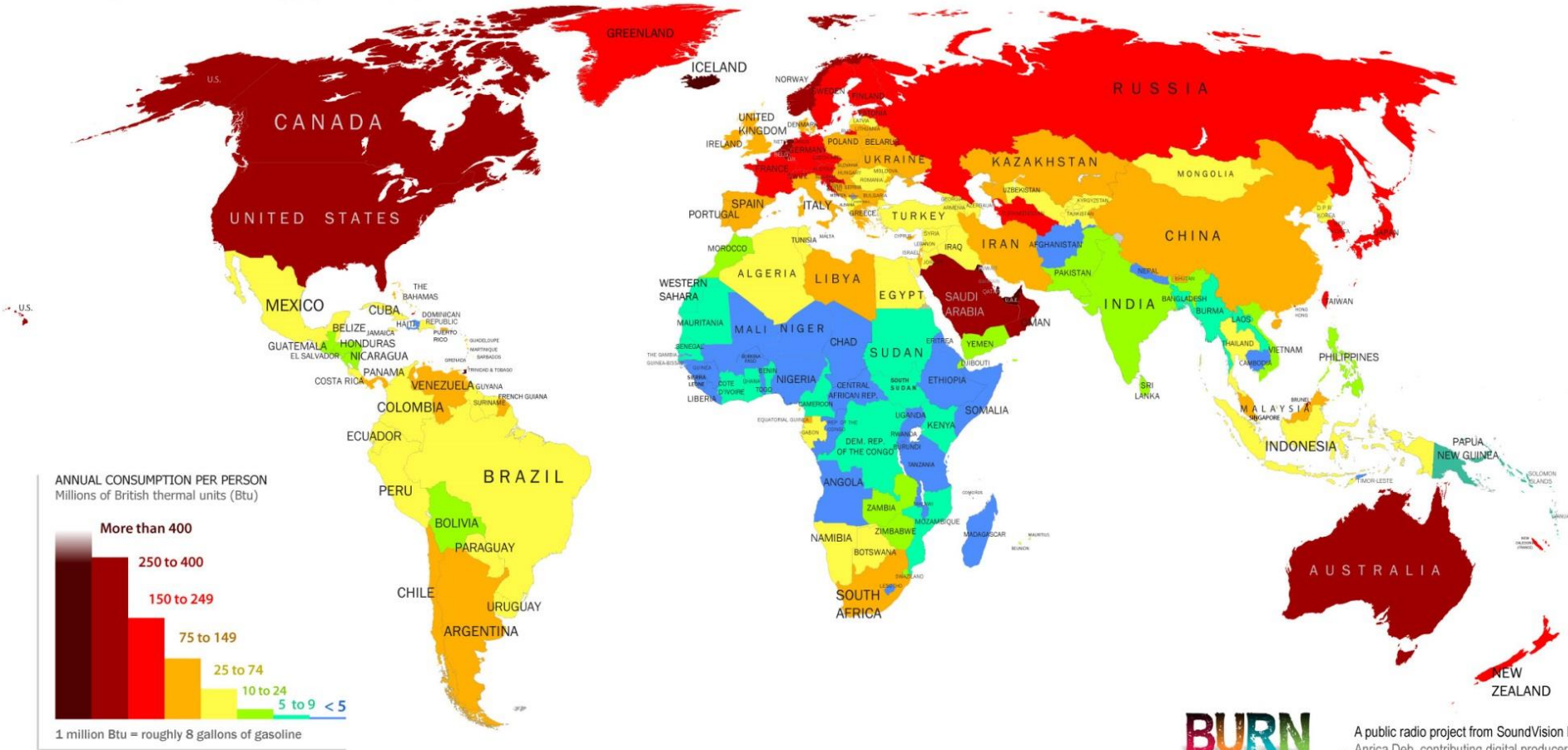
Proposal: kWh



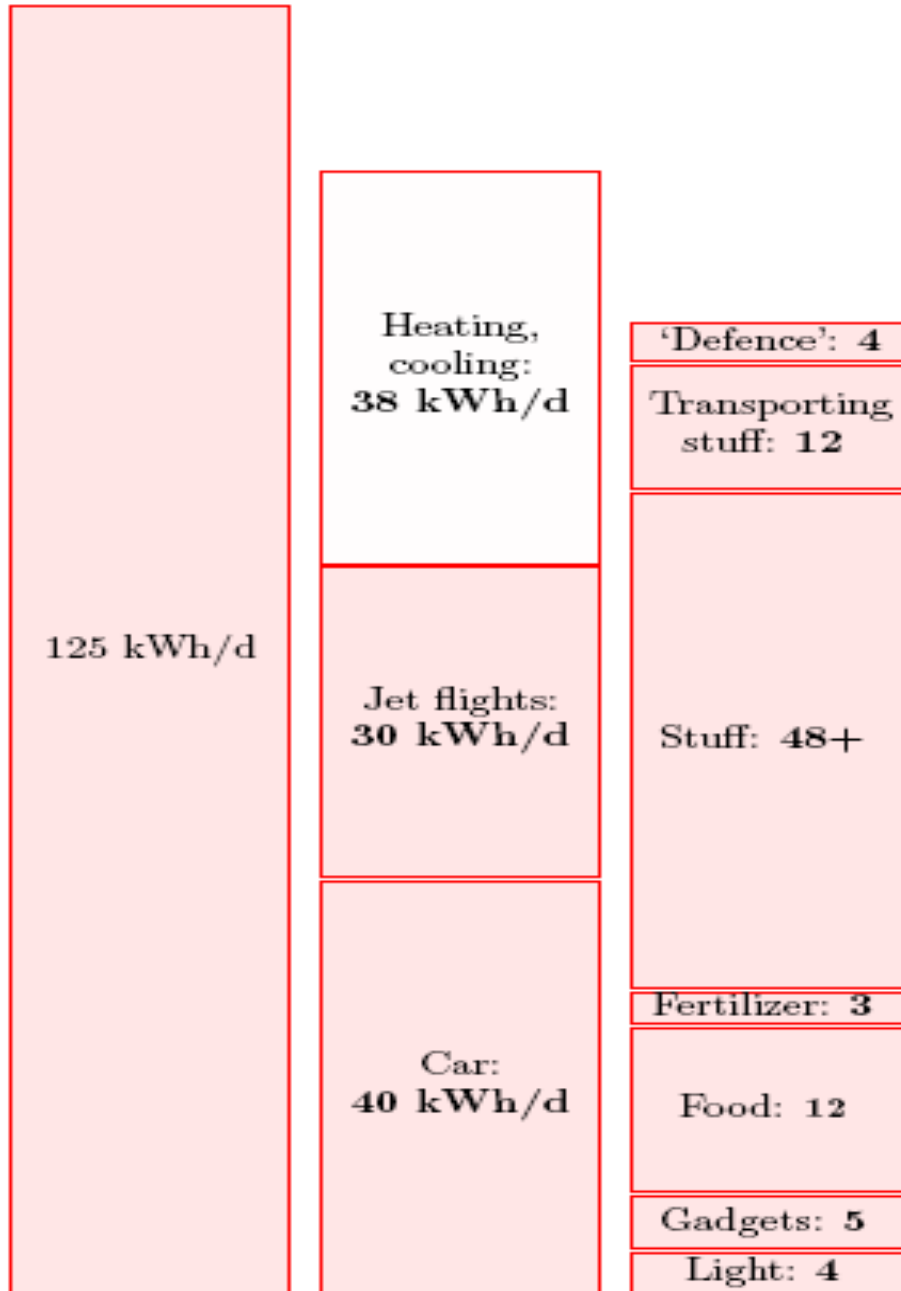
... the primary energy regional consumption

Energy Consumption Per Person, by country, 2010.

SOURCES: U.S. Energy Information Administration, International Energy Agency, CIA World Factbook, U.N. Dept of Economics and Social Affairs



Consumption



- Average EU member

125 kWh/day

- Average Slovene
- 113 kWh/day

125 kWh/day ≈ 12, 5 t CO₂/ year

	Before	What you can do	After
1,5 t CO ₂ per year	Food: 15kWh/d	<i>eat vegetarian, six days out of seven</i>	5 kWh/d
4 t CO ₂	Heating: 40kWh/d (keeping a leaky home and workplace at 20 °C)	<i>put on a sweater, be creative with the thermostats, read your meters</i>	20 kWh/d
3,5 t CO ₂	Flying: 35kWh/d (London to Los Angeles, Rome, and Malaga, yearly)	<i>video-conference instead</i>	1 kWh/d
4 t CO ₂	Car: 40kWh/d (averaging 30 miles per day)	<i>join a car club, cycle, walk, and use public transport</i>	5 kWh/d
13 t CO₂ per year			3,1 t CO₂ per year



140 kWh/d
peak 25 kW

rating photovoltaic by Amonix - Photo by David

ali



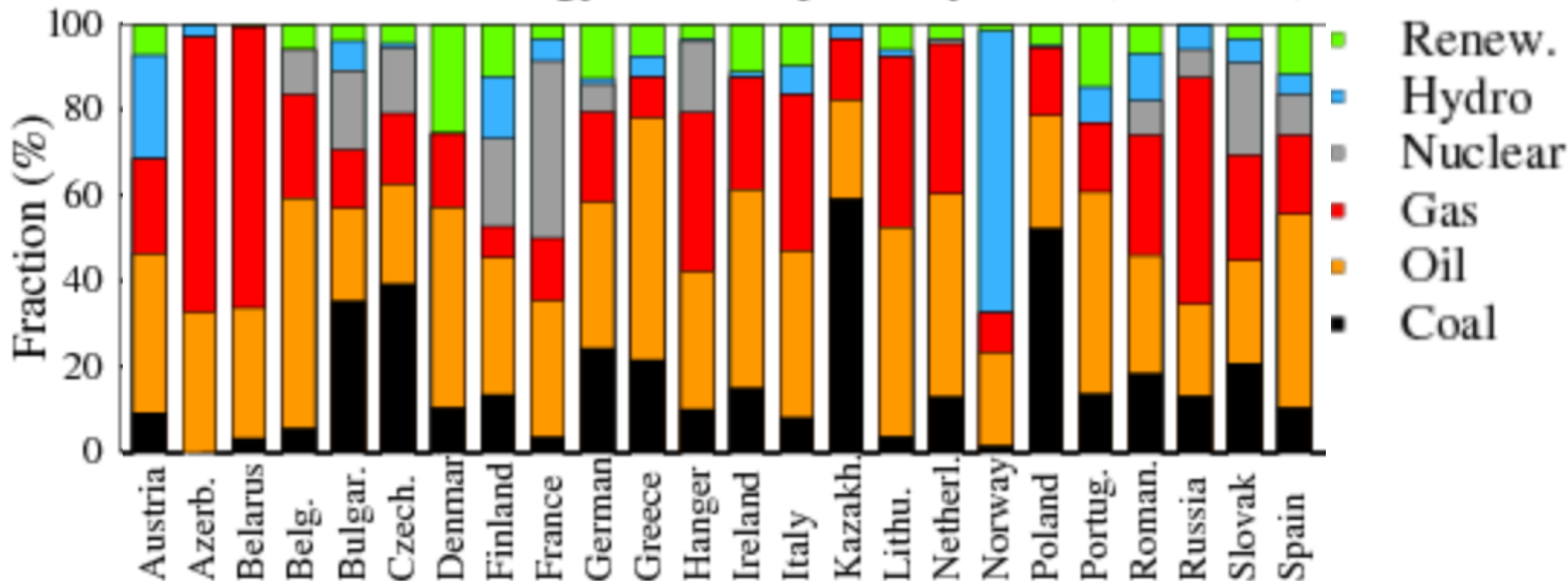
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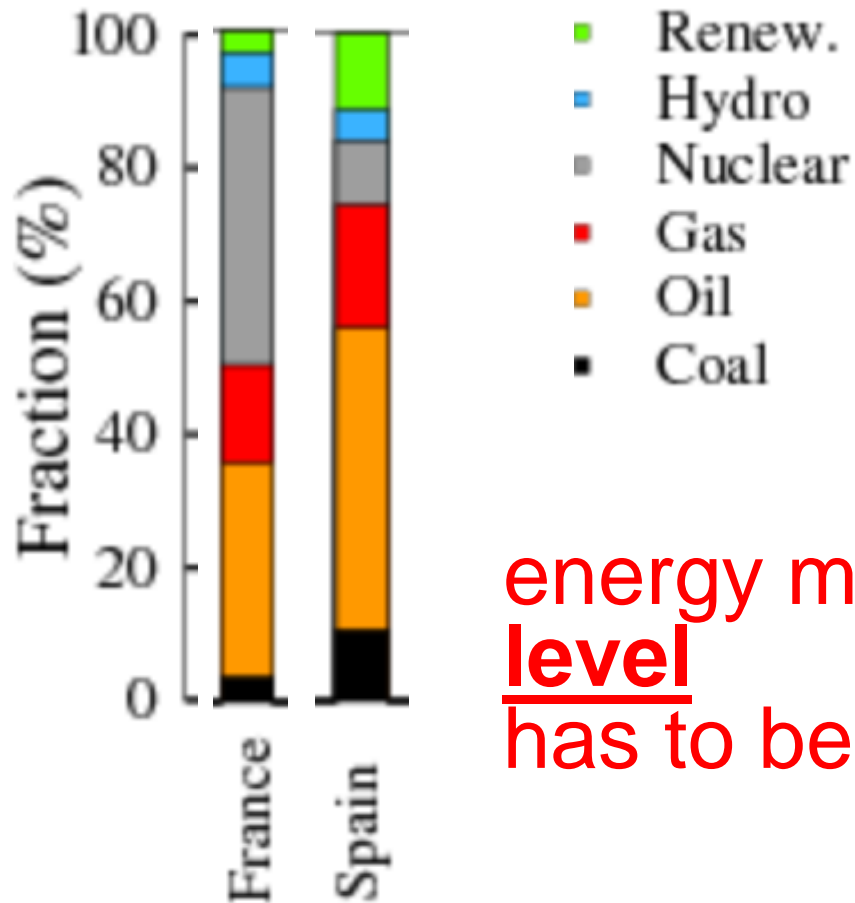


Estimate energy mix on regional level

2015 Energy Consumption by Fuel (BP Data)

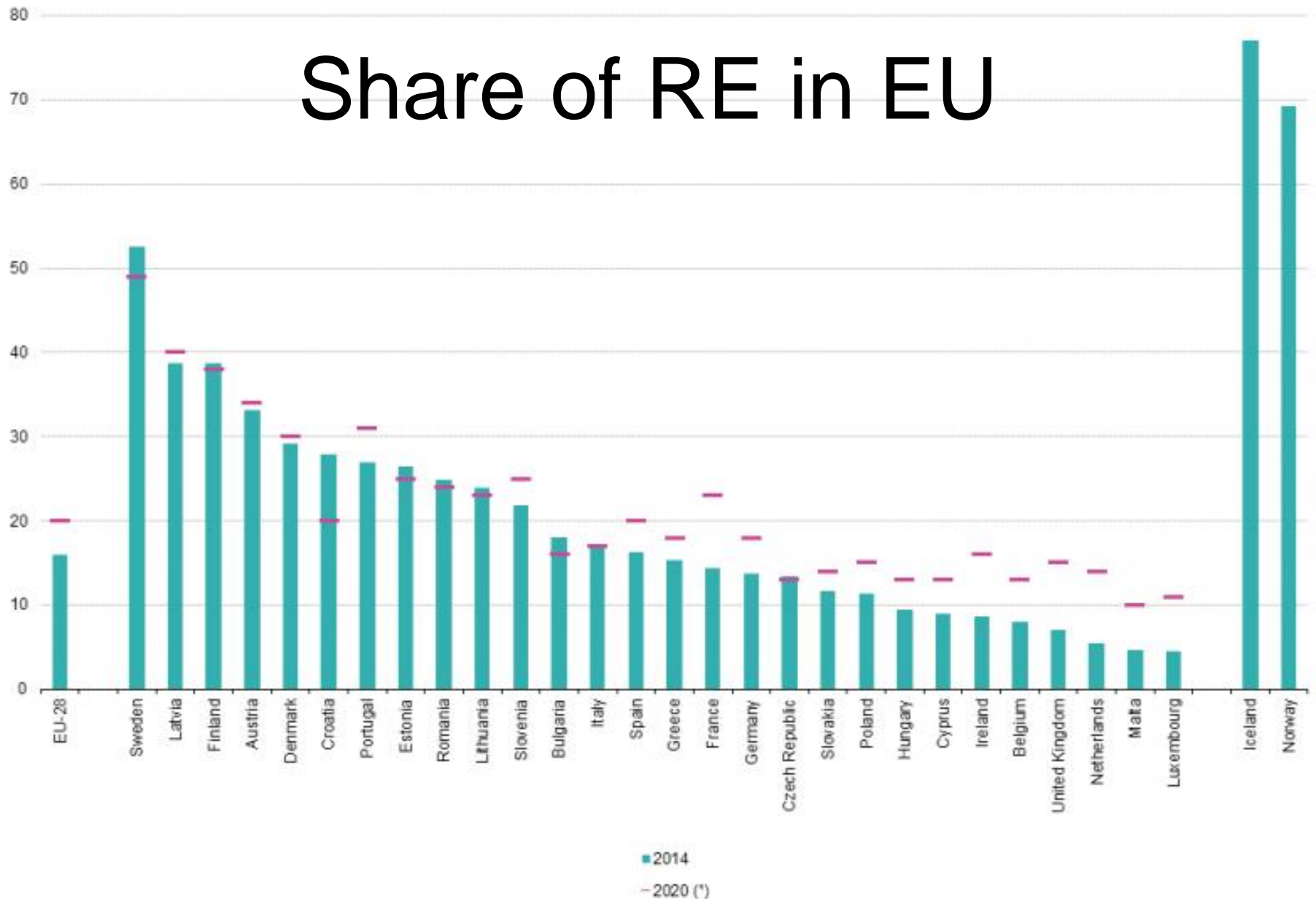


Energy mix on state level



energy mix on local level
has to be estimated

Share of RE in EU



(*) Legally binding targets for 2020. Iceland and Norway: not applicable.

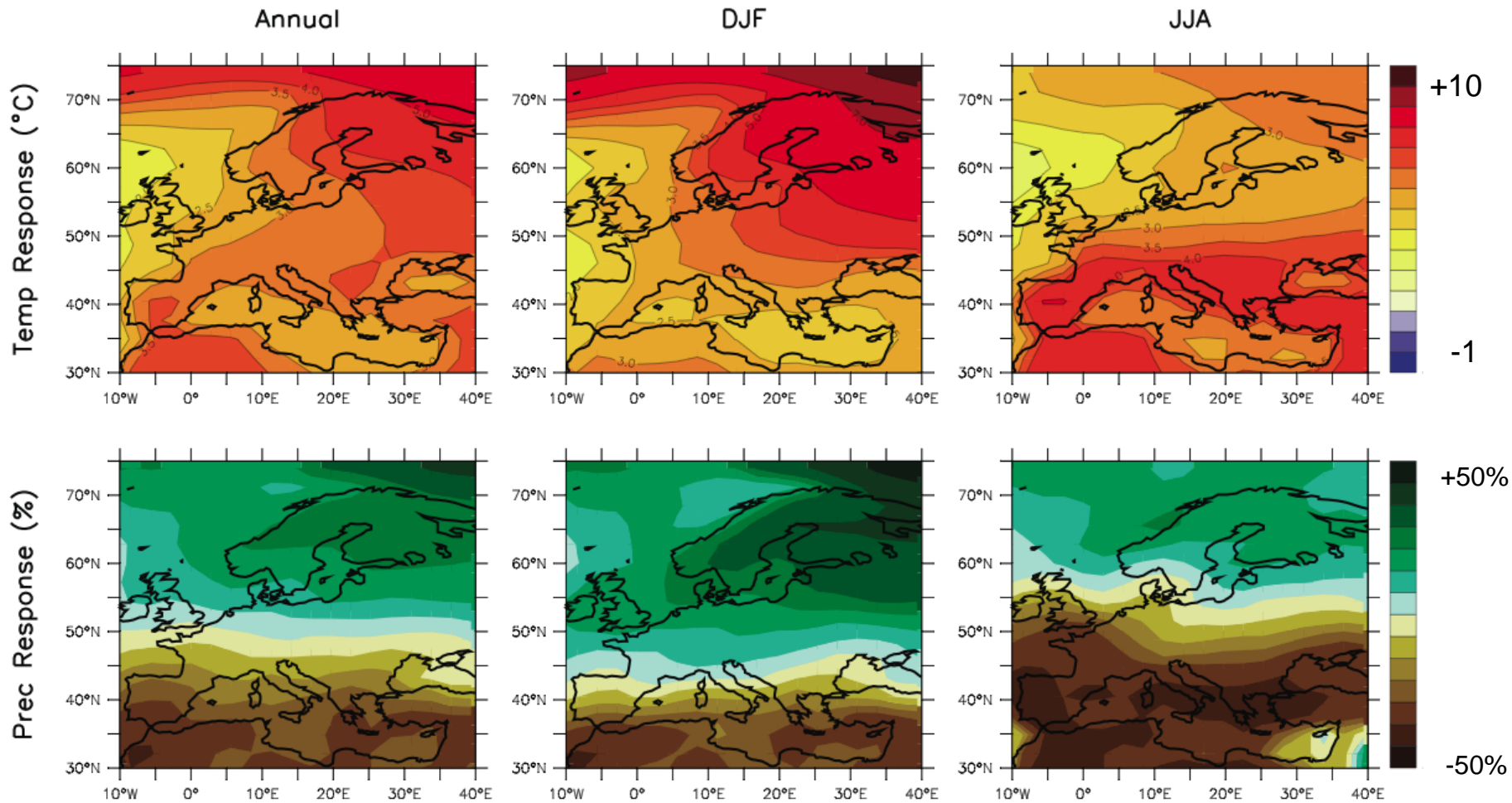
Source: Eurostat (online data code: t2020_31)



Define RE energy potential

- Not exactly known on regional/local level
- Will be more and more impacted by climate change (especially biomass) – not enough research

Europe: Geographic Changes



2080-2099 Minus 1980-1999 (A1B)

Downsides

- All renewables are diffuse
- Some cause air pollution (burning biomass)
- Visual pollution (wind turbines)
- Fossil fuels are big business (also subsidised)
- Some/most people do not like changes in general

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All renewables are diffuse

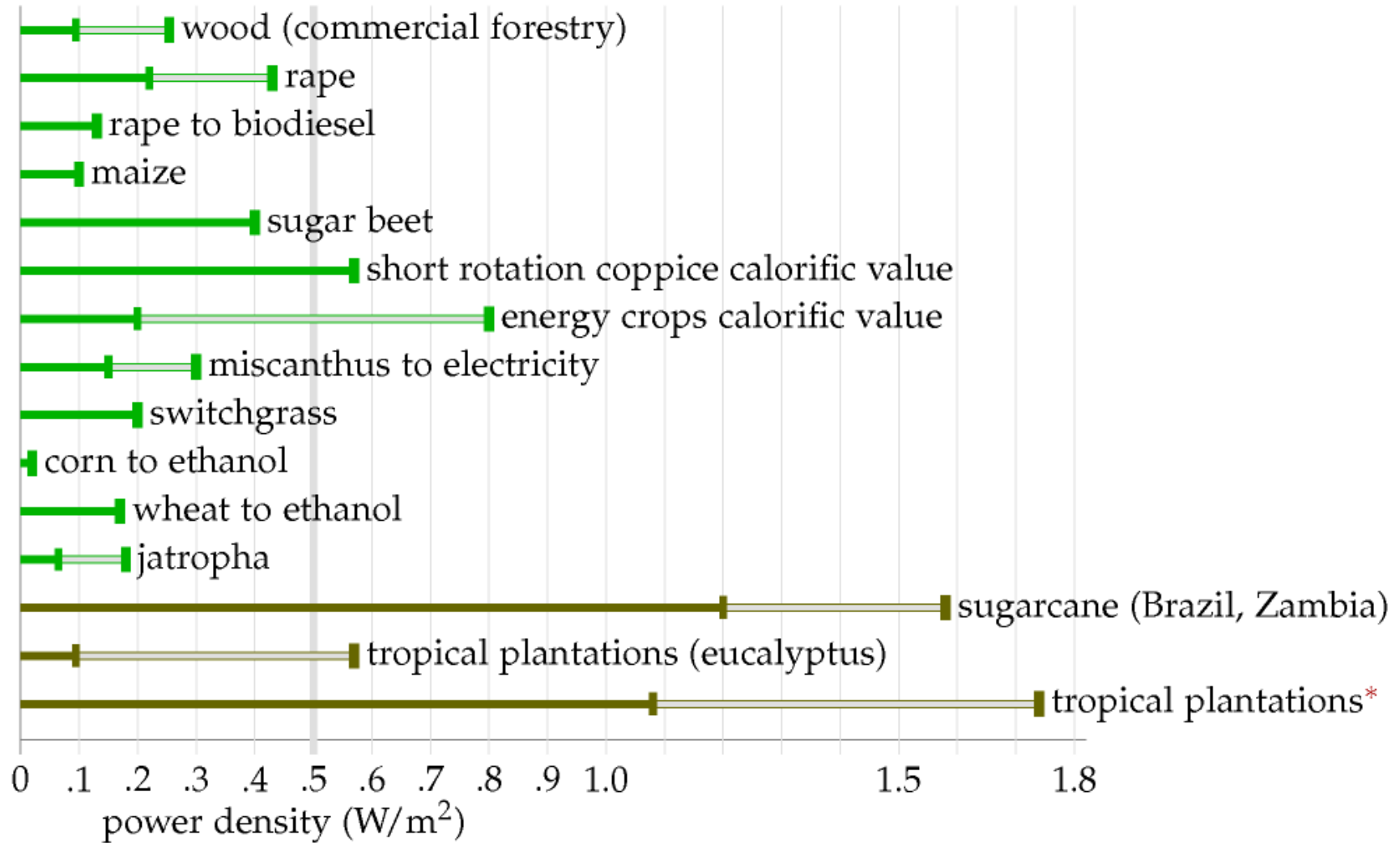
POWER PER UNIT LAND AREA

Wind	2.5 W/m ²
Plants	0.5 W/m ²
Solar PV panels	5–20 W/m ²
Tidal pools	3 W/m ²
Tidal stream	8 W/m ²
Rain-water (highlands)	0.24 W/m ²
Concentrating solar power (desert)	15–20 W/m ²



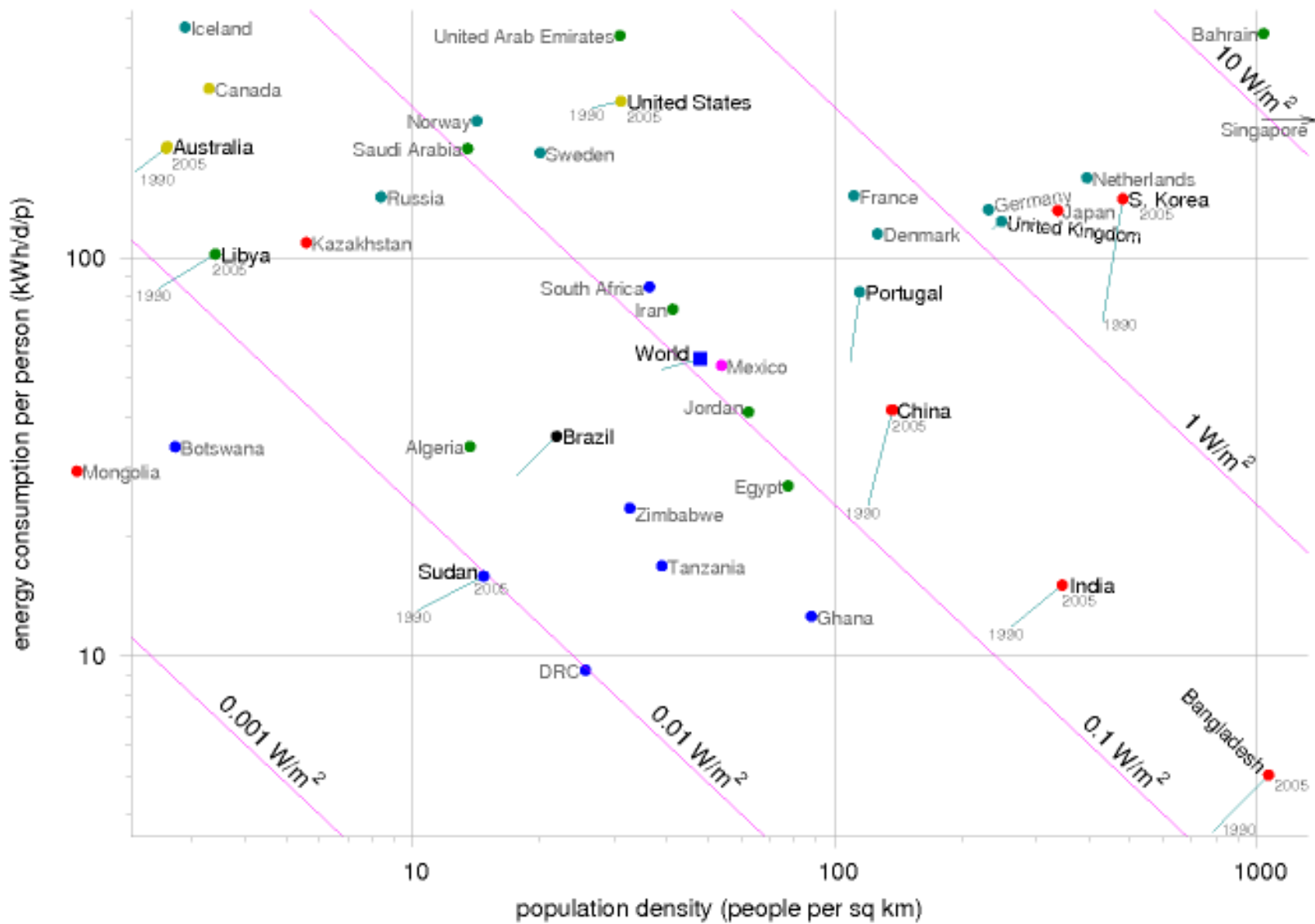
- To make a difference, renewable facilities have to be country-sized

Plant power per unit area



* assumes genetic modification, fertilizer application, and irrigation

For sources, see D J C MacKay (2008) Sustainable Energy - without the hot air



Downsides

- All renewables are diffuse
- Some cause air pollution (burning biomass)
- Visual pollution (wind turbines)
- Fossil fuels are big business (also subsidised)
- **Some/most people do not like changes in general**
- ✓ How much RE/climate change background do people have?
- ✓ How do they view the environment—as a necessity or a luxury?
- ✓ What motivates people in the region/municipality to act?

50 Reasons Not To Change

