ENE Energy, Natural Resources and the Environment

IAEE WWW.IAEE.ORG INTERNATIONAL ASSOCIATION for ENERGY ECONOMICS

NTRANS Norwegian Centre for Energy Transition Strategies

NHH

IAEE Int'l Conferencen NHH, NAEE, Bergen, 2016

NTRANS: Themes in Energy Transition Annual Meeting, December 7, 2020

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Research: Inter alia: Energy, Envt'l policy

NORWEGIAN SCHOOL OF ECONOMICS

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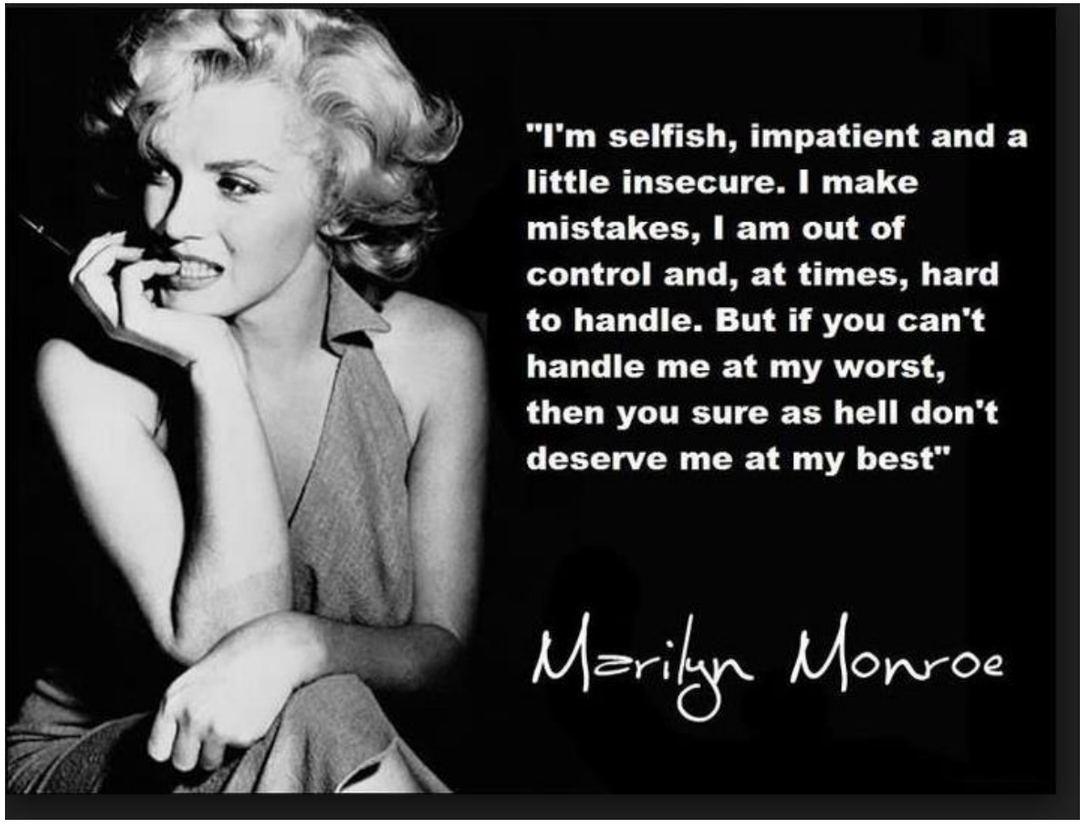
The Market Mechanism:
Difficult to handle at times: But that is what it takes

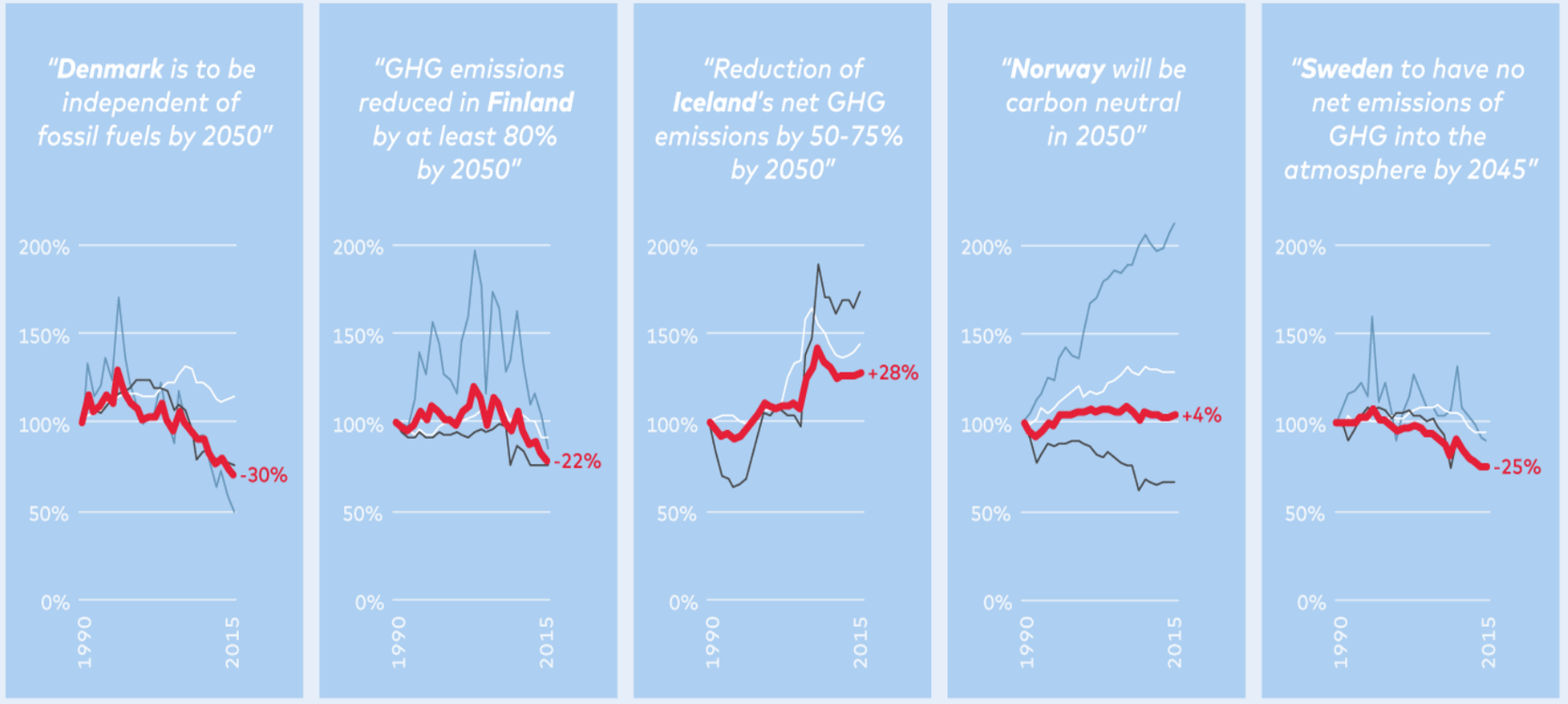
1. Market integration as a resource, a strength: in Norway, Nordics, Europe, World?
2. Electricity wins: can windmills be placed: institutions!
3. Electricity wins: making its way in transport: demonstration
4. The role of owners, ESG, a new research area
5. Interesting times we live in



3. Low-carbon ambitions

The carbon intensity of Nordic electricity is under 60 gCO_2/kWh, compared to the global average of over 500. The world needs to match the current Nordic level by 2045 in order to realise the IEA's 2°C Scenario. An abundance of low-carbon electricity in the Nordic region provides a stepping stone to the mitigation of emissions from the more challenging sectors of transport and industry.

Climate targets and GHG emissions



Source: UNFCCC, national governments (targets). Note: Norway's increase in energy supply emissions is due to oil and gas extraction. Iceland's target is currently under revision, its energy supply emissions are insignificant and not shown, and its increase in industrial emissions is due to aluminium production. Fluctuations in energy supply emissions in Denmark, Finland and Sweden are primarily due to thermal generation providing seasonal balancing to hydropower (wet/dry years) and heat demand (cold/warm winters).

GHG, Nordics: Norway not impressive, yet: +4%:

i. Growth in GDP, pop.
ii. Growth in petroleum extraction sector
iii. Growth in transport

Also: Iceland:

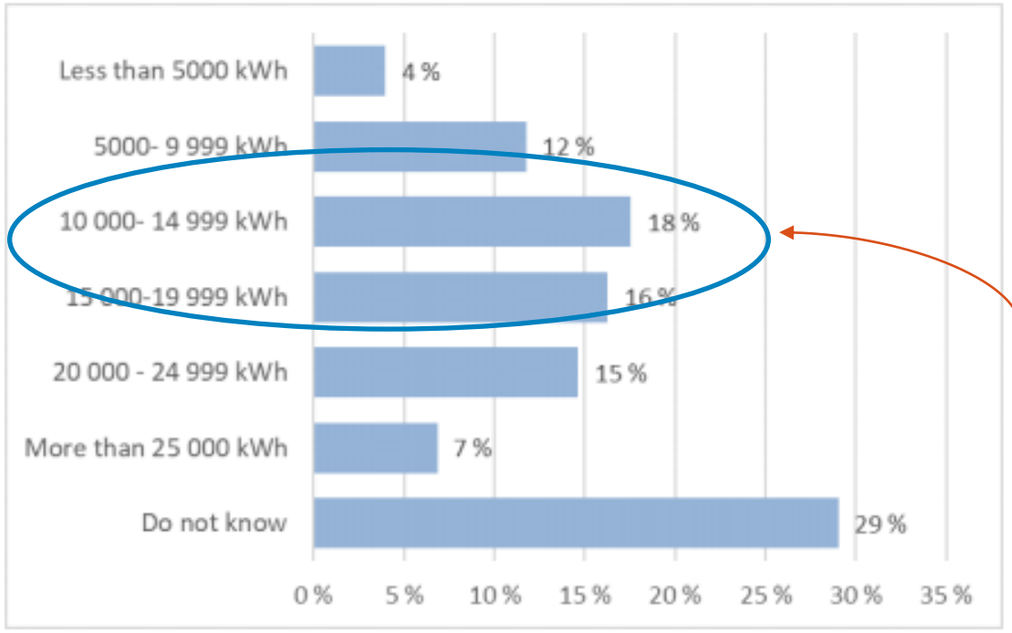
i. Due to growth in CO_2 intensive manufacturing
ii. Possibly, like Norway: comparative advantage *through* transition
iii. Perhaps, then, CCS

Electricity, Nordics: Norway uses *vastly more electricity* for heating

demand in the residential and service sectors. We use Patronen et al. (2017) as our source of information and find that electricity used for space heating[14] in the four countries in 2013 was:

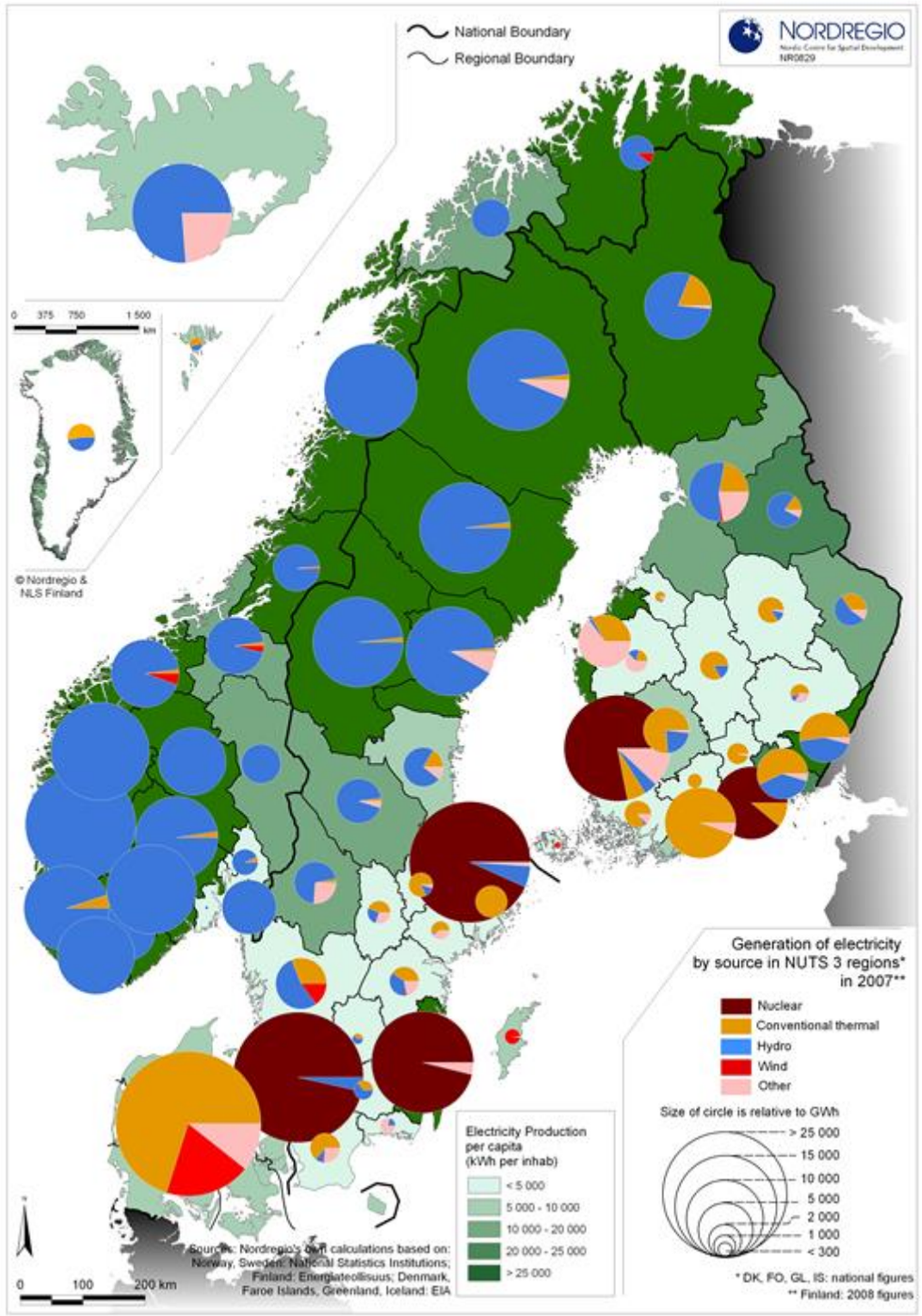
- Denmark 1.5 TWh
- Norway 62 TWh
- Sweden 22 TWh
- Finland 13 TWh

Figure 108: *Approximately how many kilowatt-hours do you use each year?* N=1506.



NORWAY

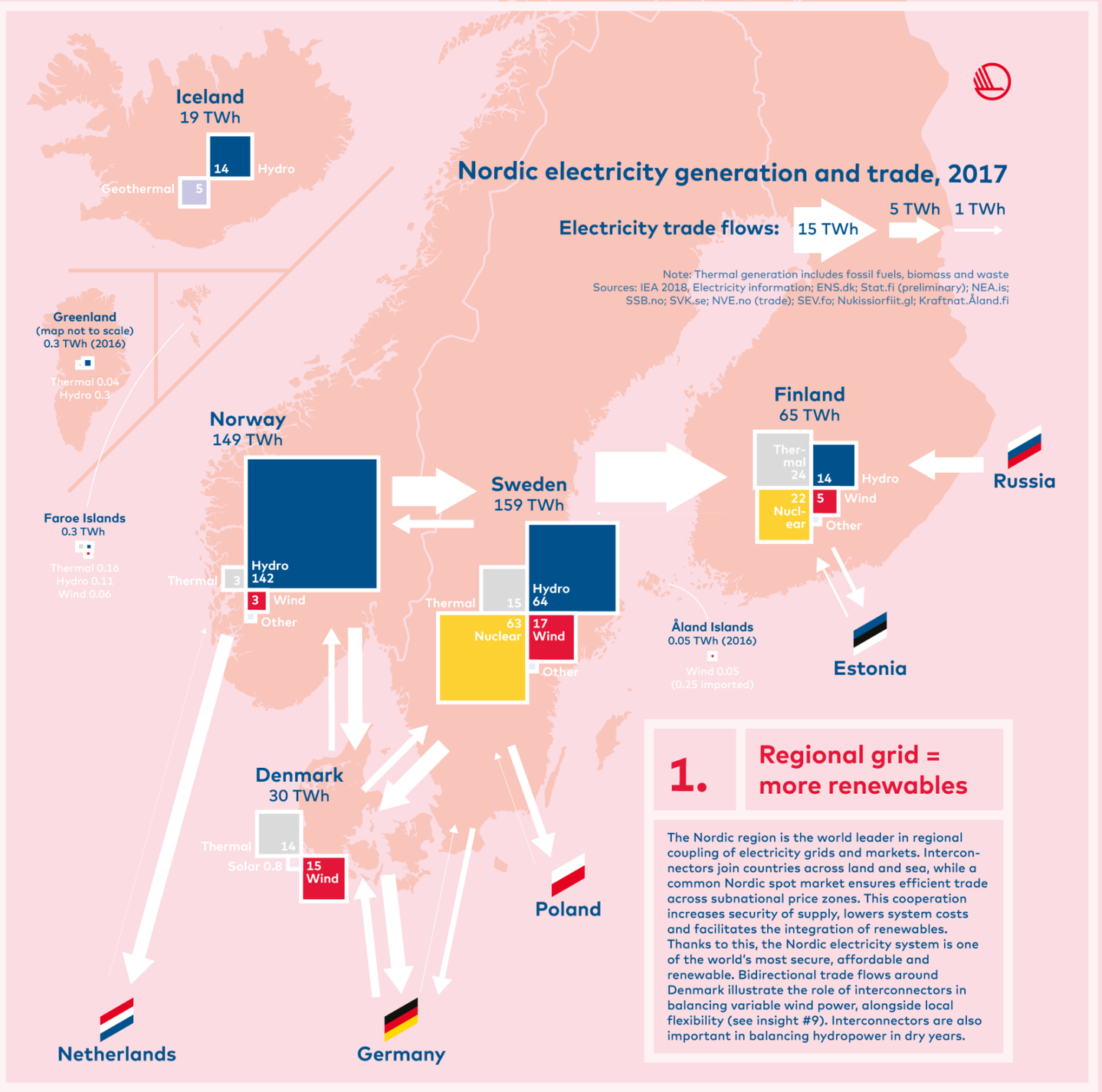
- Households use a lot of electricity
- History of electricity: ample, fairly cheap
- Sprawl: single family homes:
  - very little district heating,
  - no gas networks
- My family, very guilty:
  - An ‘excellent’ 1916 wooden house (year Bergen burned)
  - > 30 thousand kwh annually, including
  - family’s only car, 8 thousand miles per year, fully electric (fuel hose shown).



Electricity generation:

- yes, these identical quintuplets…

- Should not be left: HOME ALONE!
- Complementary, perhaps: need each other



Nordics: El-market Integration

i) Transmission

ii) Market

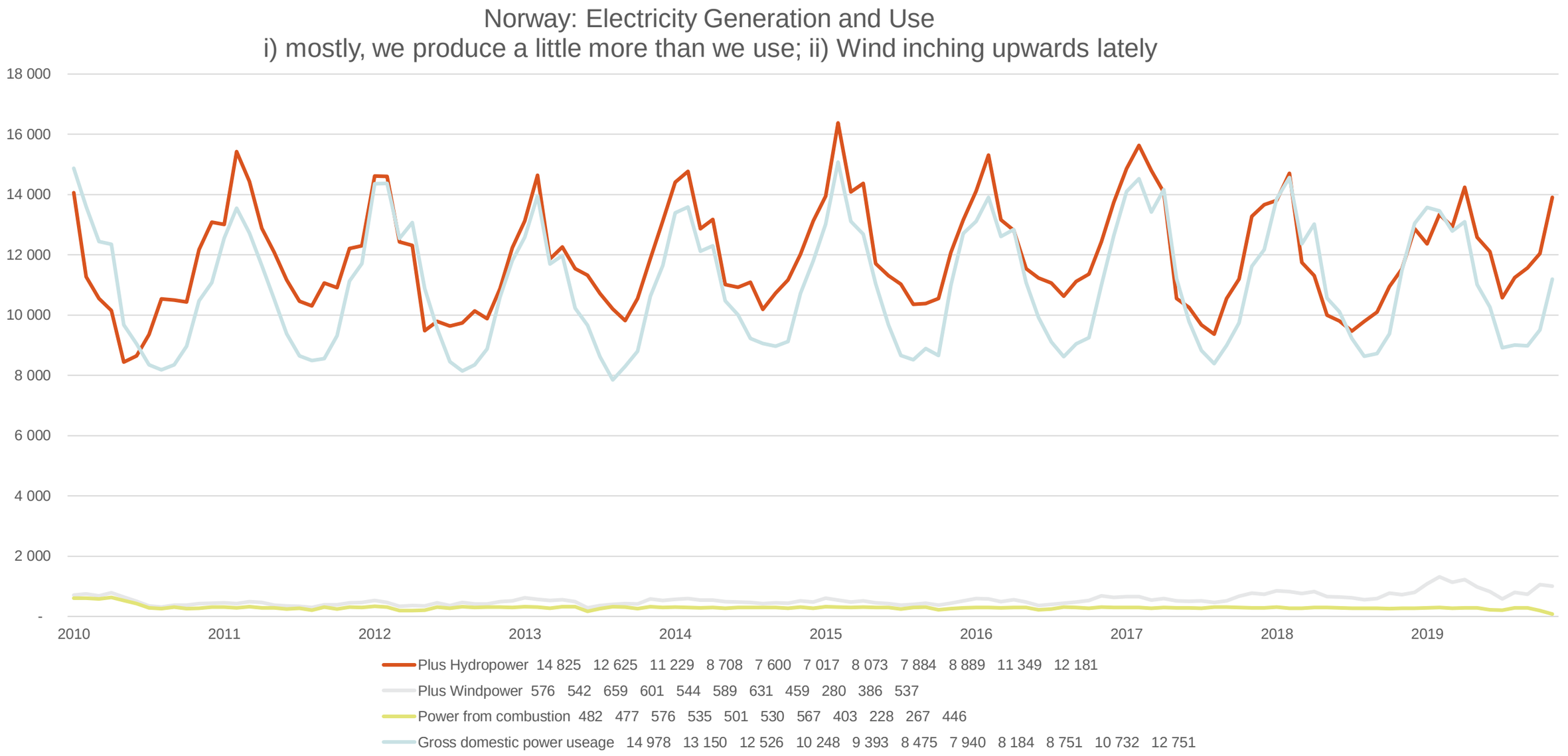
Integration <u>importance</u>

a) weather and seasons affect demand *and* supply;

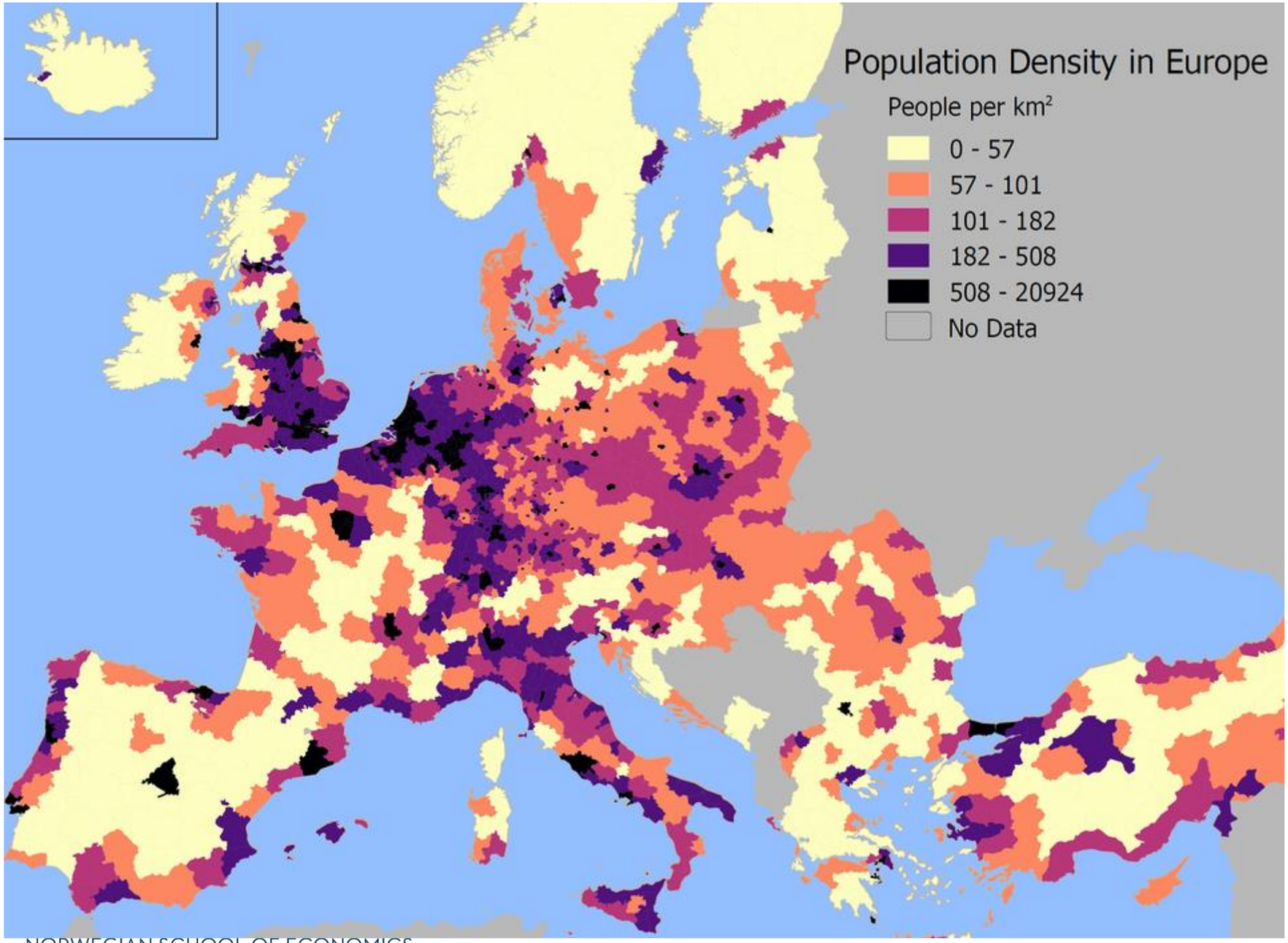
b) unfaithful lovers: wind, sun;

c) Differences: reservoirs, heating;

d) Danish wind seen in Norwegian reservoirs.



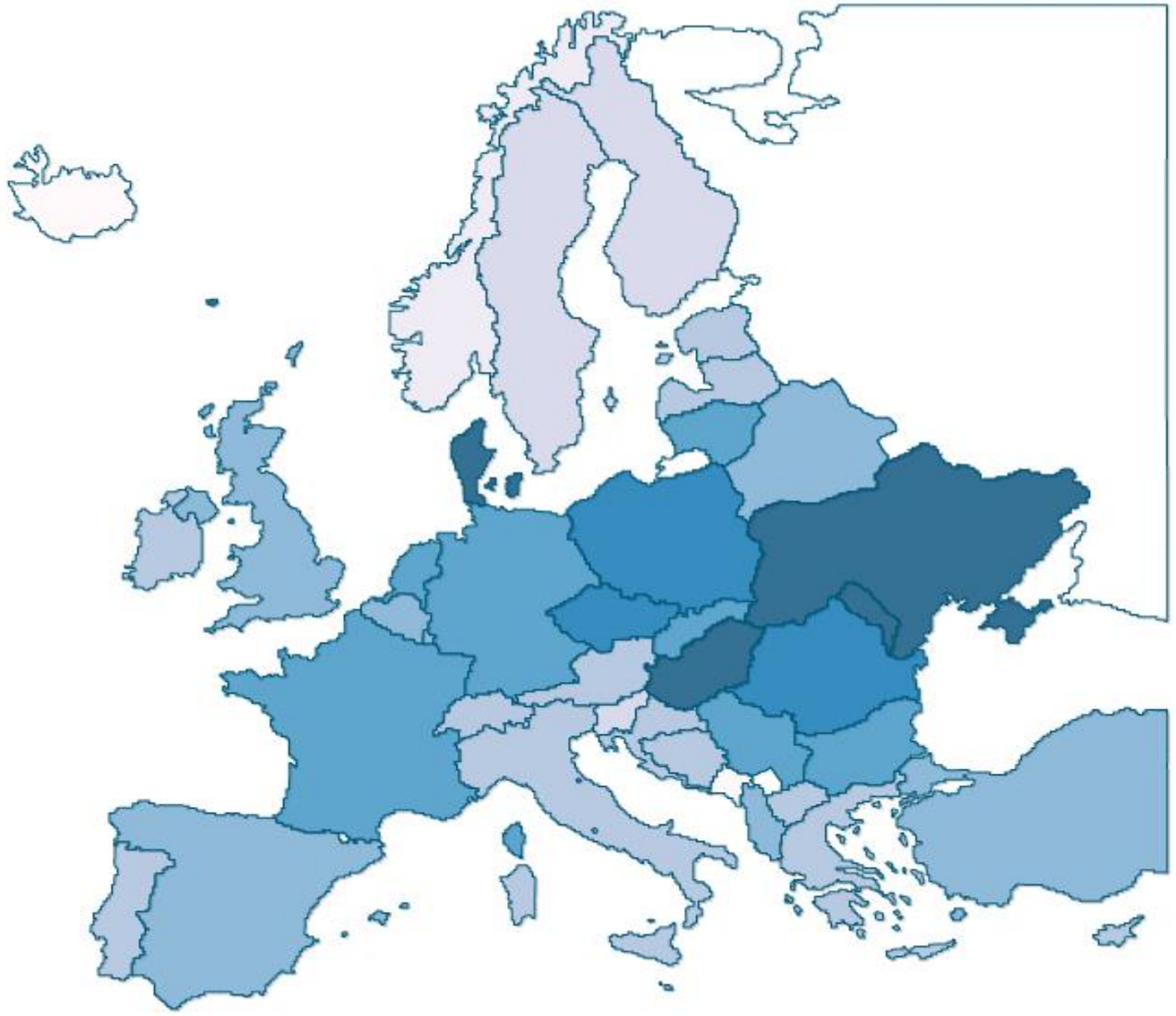
iii) Our reservoirs are highly dispatchable: A facility rising in value, in Europe's in transition?



Norway: How can wind power be hard to place?

Who has more windy land area (to spare)?

Agricultural land: %: Evolving institutions



Norway is largely

- *Uncultivated (97%)*

Resulting in

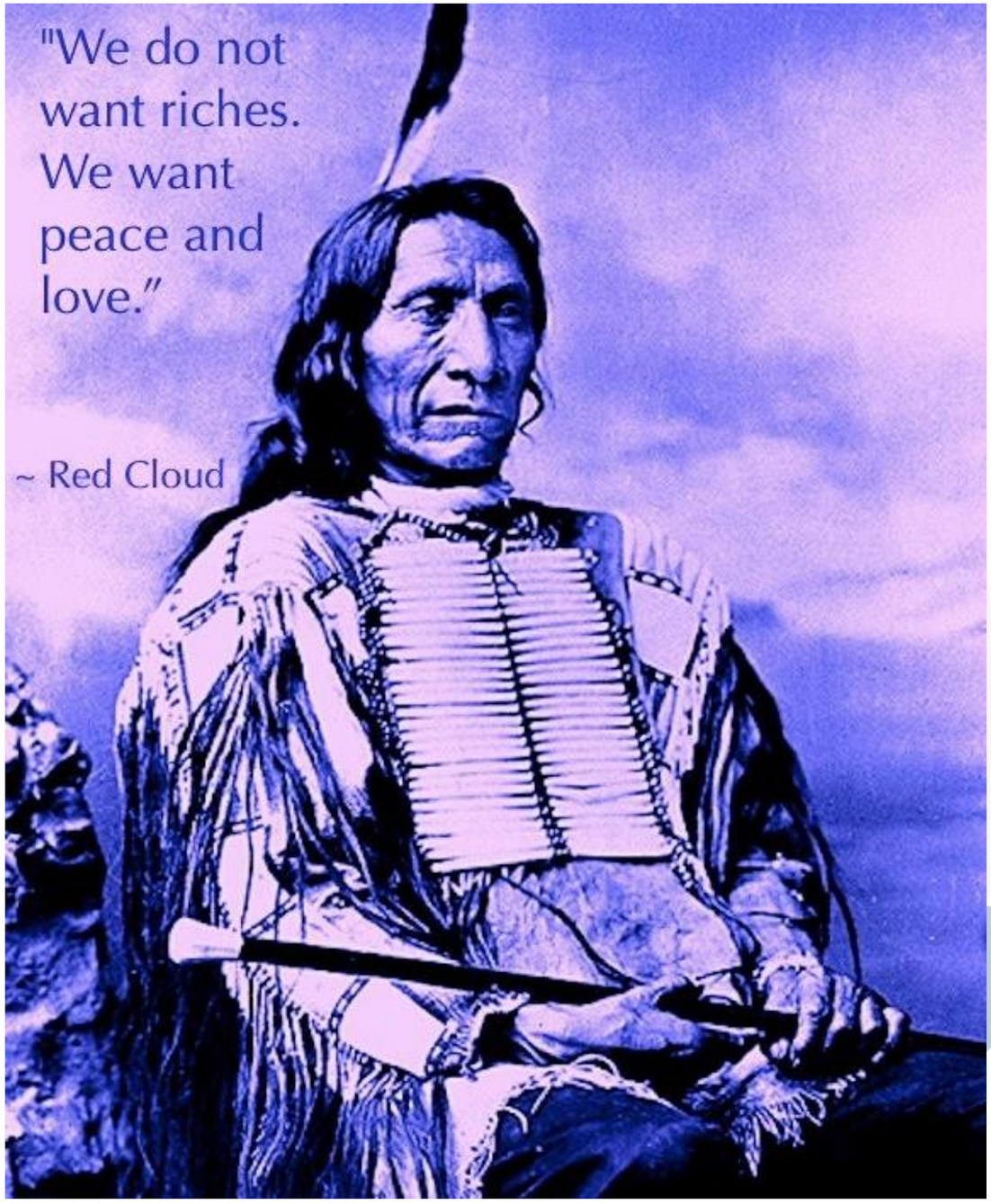
- *public access* institutions,
- *social control* rights to land.

Build windmill in Denmark:

- talk to just one farmer.

In Norway:

- talk to whole town, even if land is privately owned



White man made me many promises.

He never kept but one.

He promised to take my land and he took it.

Red Cloud of the Oglala Sioux

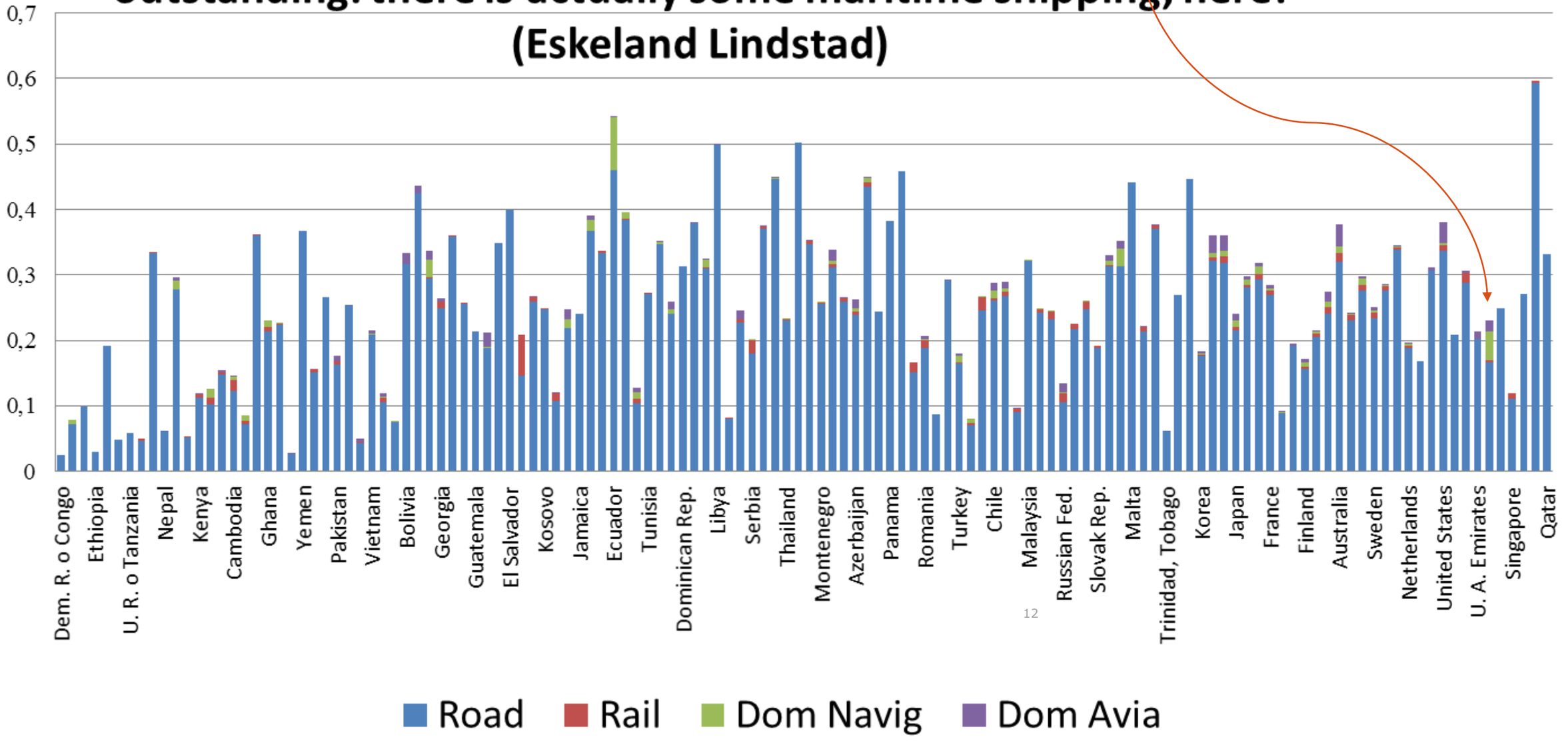
Land that is Uncultivated or Nomadically used has widely distributed control rights.

How these control rights comprise or accommocate decisionmaking is still in the mold?.

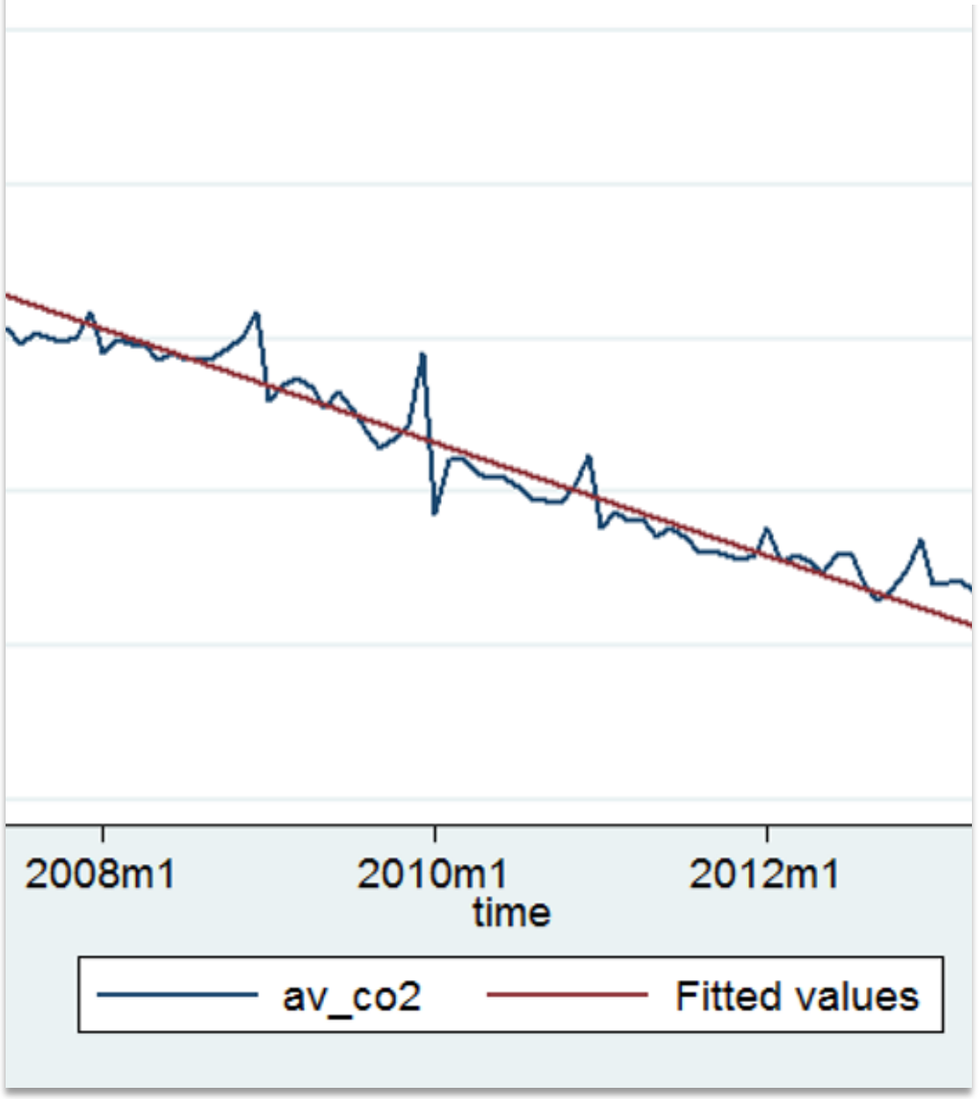
Do lessons translate to ocean and space, planets?

Domestic transport's share in country's energy use: Norway outstanding: there is actually some maritime shipping, here! (Eskeland Lindstad)

General: Domestic transport: 20-25% of domestic energy use (38% in US). Mostly road.



‘HOMO ECONOMICUS SQUARED’



(apropos trunkerte akser)

Study of tax schemes used to change car fleet

a) Yes, CO2 intensitety coming down

b) Some funny jumps: if you want carbon intensive, buy end of year

Electricity wins: Norway aggressively pulling electricity into transport.
Why:
we are early out with emission free generation

i) international oceangoing shipping can barely buy solutions that are very expensive.

ii) in our coastal shipping, tests and demonstration of zero emission solutions are not out of the question, incl port electricity,

A Trumpian critique would be; paint Ampere green:

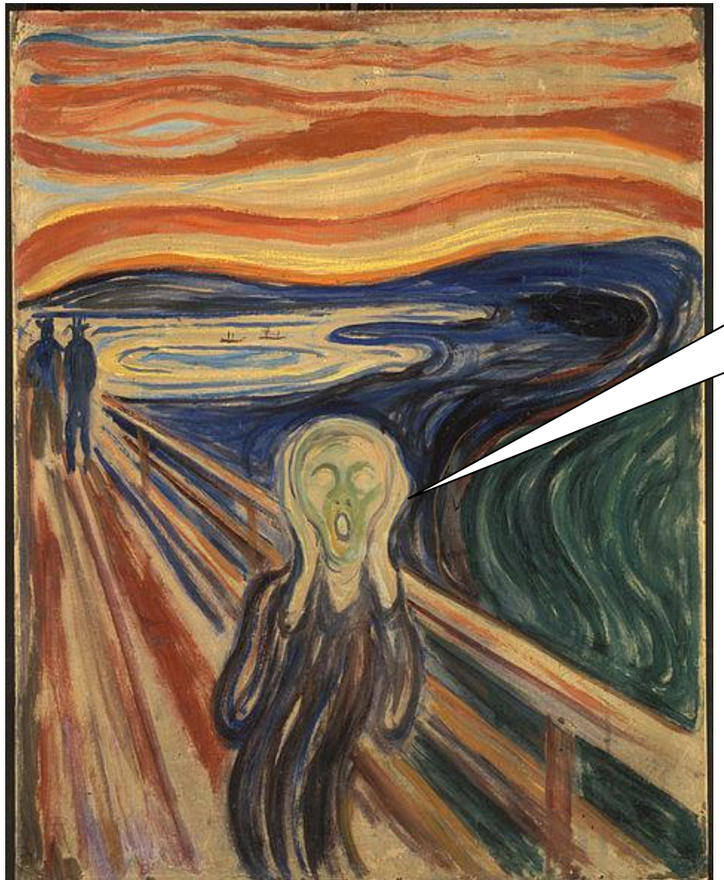
Boasting of yourself IS
a) a *purpose* and
b) an *acid test*

ESG: Is hearts and minds going to be a driver, from owners, from financiers?

Three foundations, amongst financiers

- Let us understand new risks and opportunities (old fashioned, but new)
- This is expected of us: from customers, suppliers, regulators (nudge?)
- Right thing to do. Hearts, temple, grandkids

The Investor Pays Principle
Evolving Institutions and the Coase Theorem



Houston, we've got a problem

9.1.2020

Gunnar S. Eskeland

Innlegg: Norsk gass trenger nok fangst og lagring også

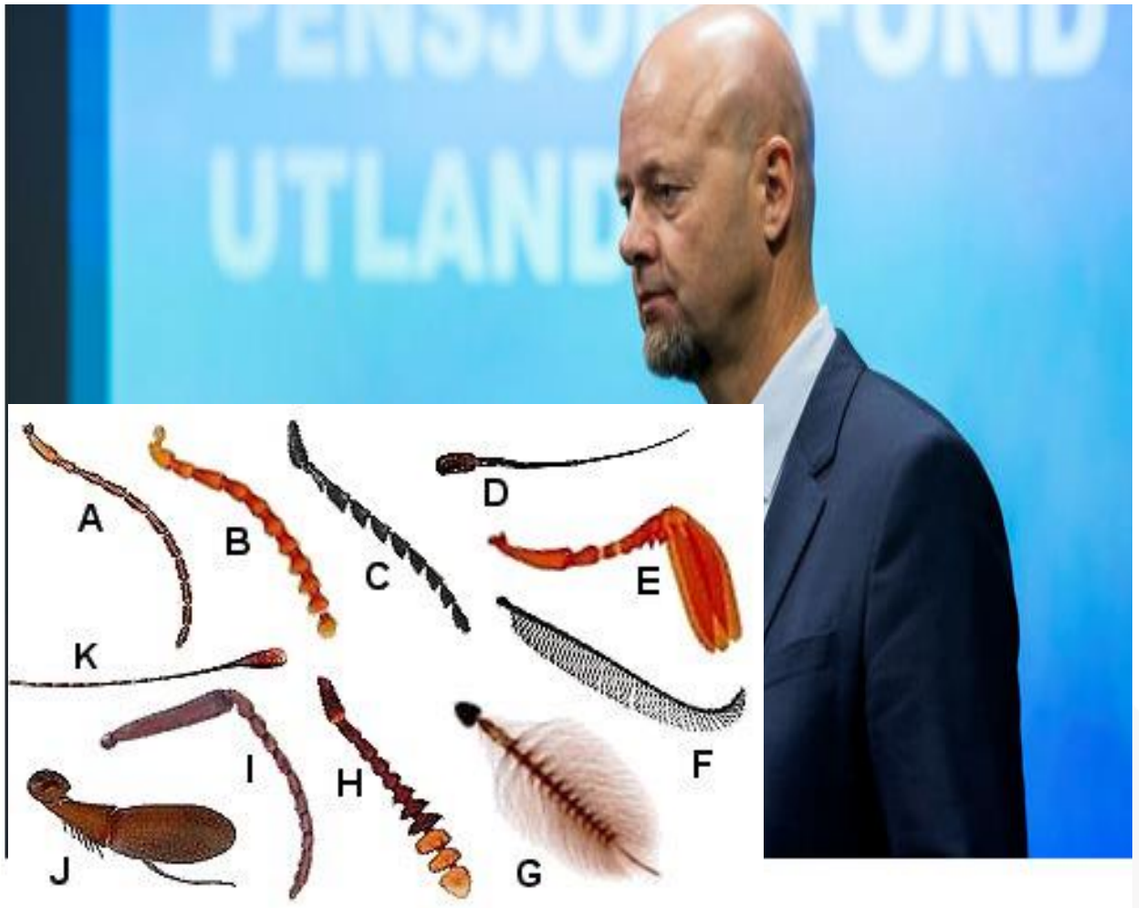
Innlegg

- An environmental problem must *arise* for protective instutions to emerge

- *Obligations* move upstream.

- *Rights* strengthen downstream (a nonCoasean idea)

- Grunnlovens paragraf 112, 2014: rett til rent miljø



Oljefondet skal ut
av råolieproduksjon

An Upstream Theory:
Could it be that those who take the longest termdecisions have the longest antennae?

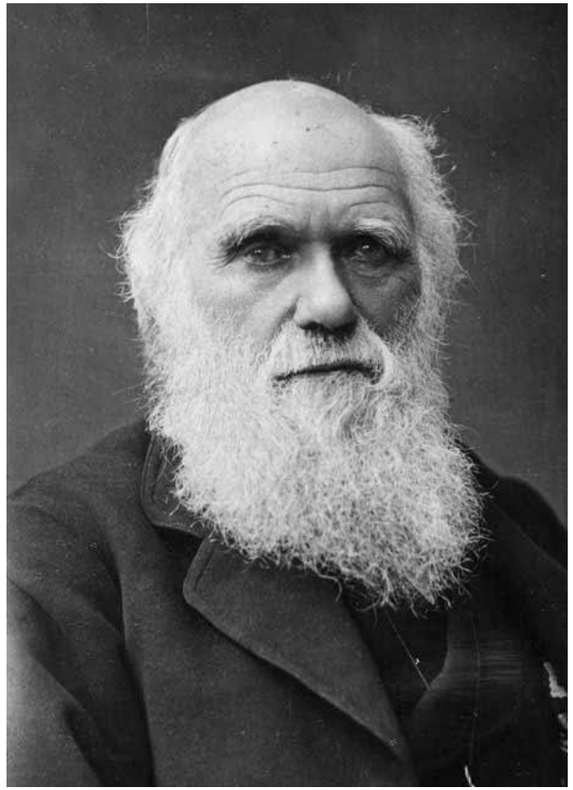
Hearts and minds: Could financiers, owners, *care* about climate change, emissions, lies, ESG? Could they not?

The studies of ‘sin portfolio’ might so indicate

Picture, called ‘the seven dwarfs’ portray the CEOs in USA’s largest tobacco companies. Under oath in Senate Waxman hearings (1994):

‘I believe nicotine is not addictive, yes’


ARTHUR
ANDERSEN
ACCOUNTING
EST.
1913
R.I.P.
2002
Bennett
THE CHRISTIAN SCIENCE MONITOR



ESG: As our field of economics evolves

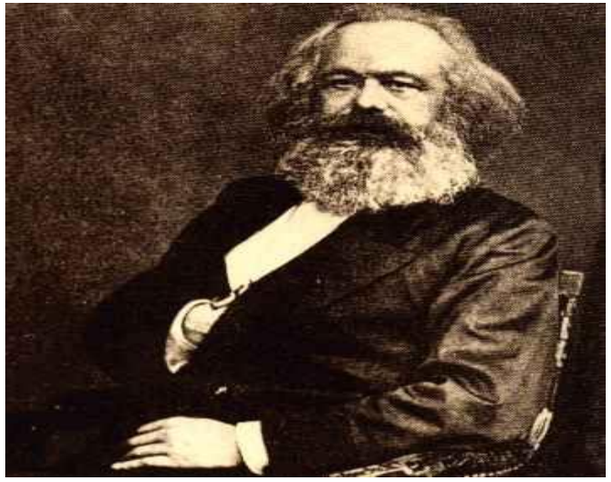
We are pulled from neoclassical back towards the classicists, especially these three Charles:

i. Darwin

ii. Claus, or St. Niclaus

iii. Marx

Theirs is world in which distribution and *ownership counts*: There is no ‘efficiency’ not related directly to who gets what.



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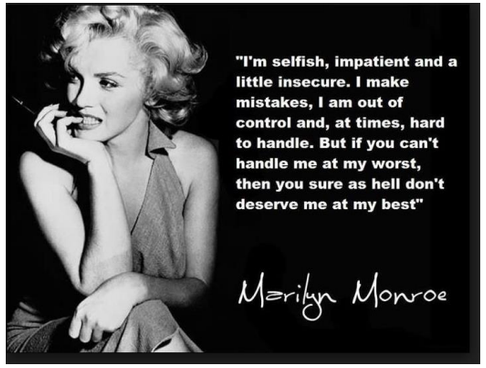

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Rethink Economics