

SOLAR BACKBONE FOR A SWIFT TRANSITION TO 24x7 RENEWABLE ENERGY FOR ALL SECTORS AND GLOBAL REGIONS

Dr. Thure Traber

August 22nd, 2021

About the Energy Watch Group

- Independent, non-profit think-and-do tank based in Berlin
- President: Hans-Josef Fell, former member of the German parliament (Green Party) and co-initiator of the effective German feed-in Tariff
- committed to advancing climate awareness and political action towards 100 % renewable energy worldwide



Scientific
Analysis



Policy
Advocacy

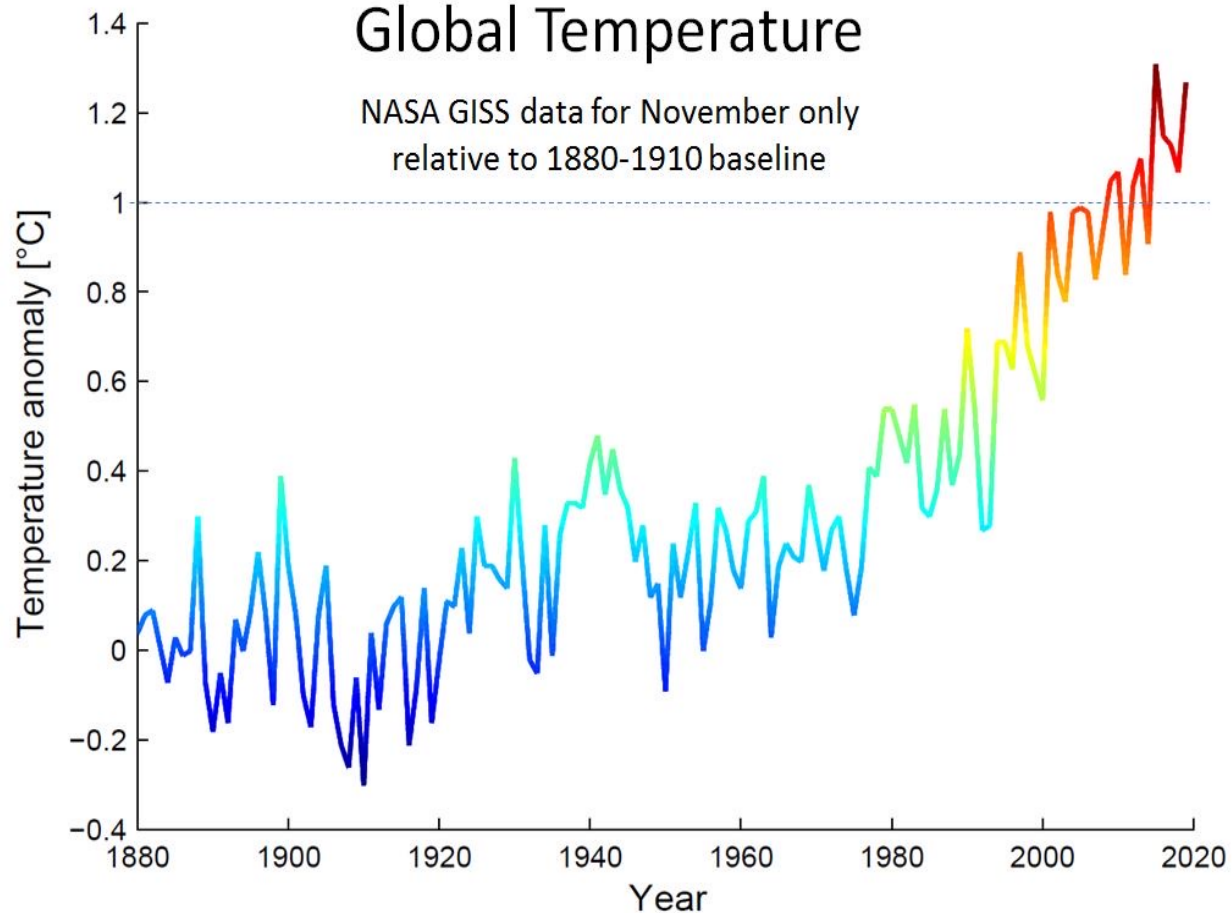


Dialogue &
Public Relations

Climate development at the core: Current RCP8.5 course

Global Temperature

NASA GISS data for November only
relative to 1880-1910 baseline

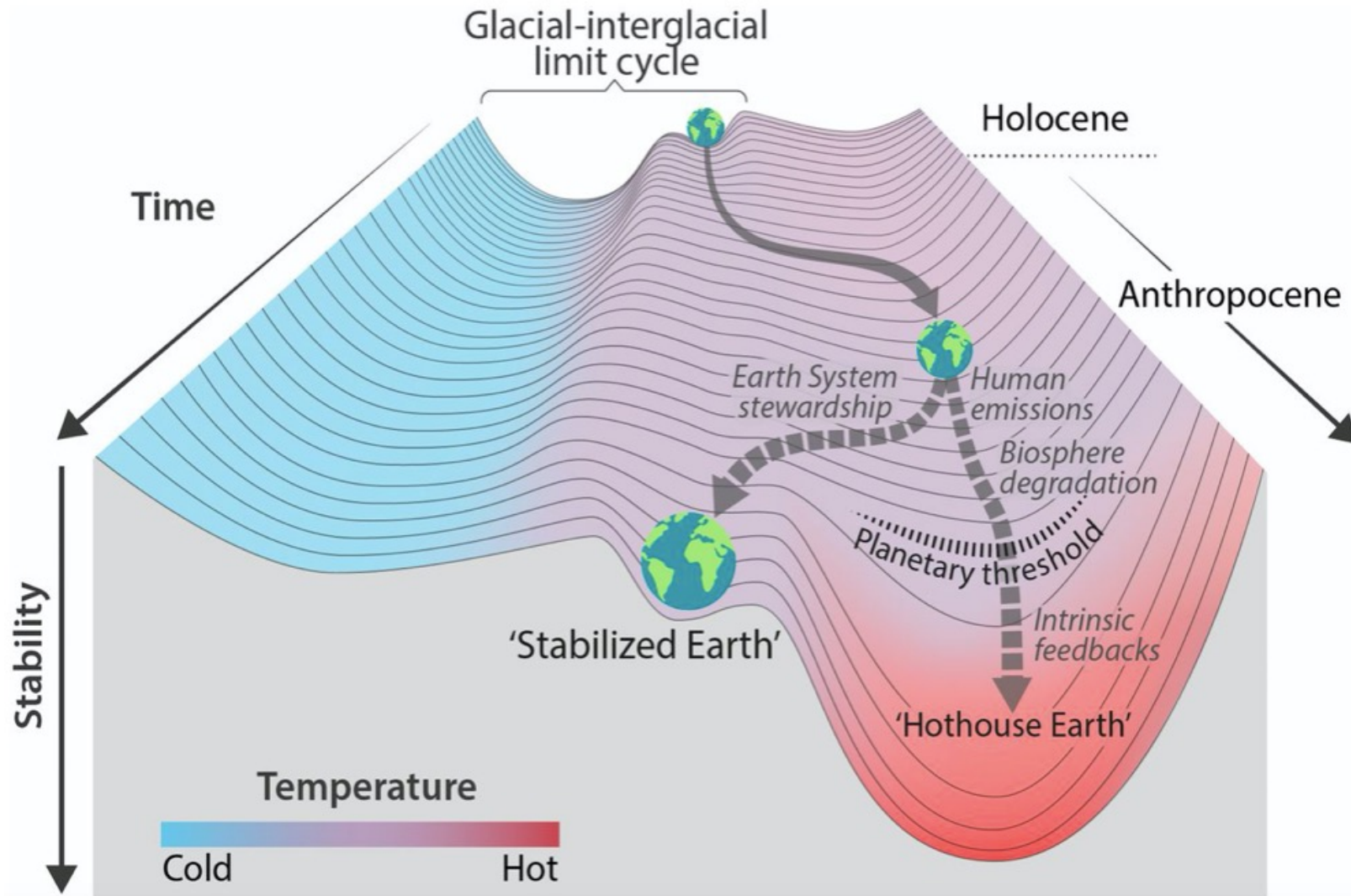


IPCC last week adopted its assessment to reality: State of the temperature +1.1

The temperature development accelerates
Expected damages:

Current RCP8.5 (IPCC) warming path
50 to 100 percent of GDP
(Bourke et al. 2015, no risk analysis)

Current RCP8.5 pathway of bowling alley



Hothouse Earth' path is risked by triggering feedbacks in the Earth system

Damages Hothouse: 50% - 100% of global GNP

Action crucial!

Illustration: Steffen, W. et al. (2018)

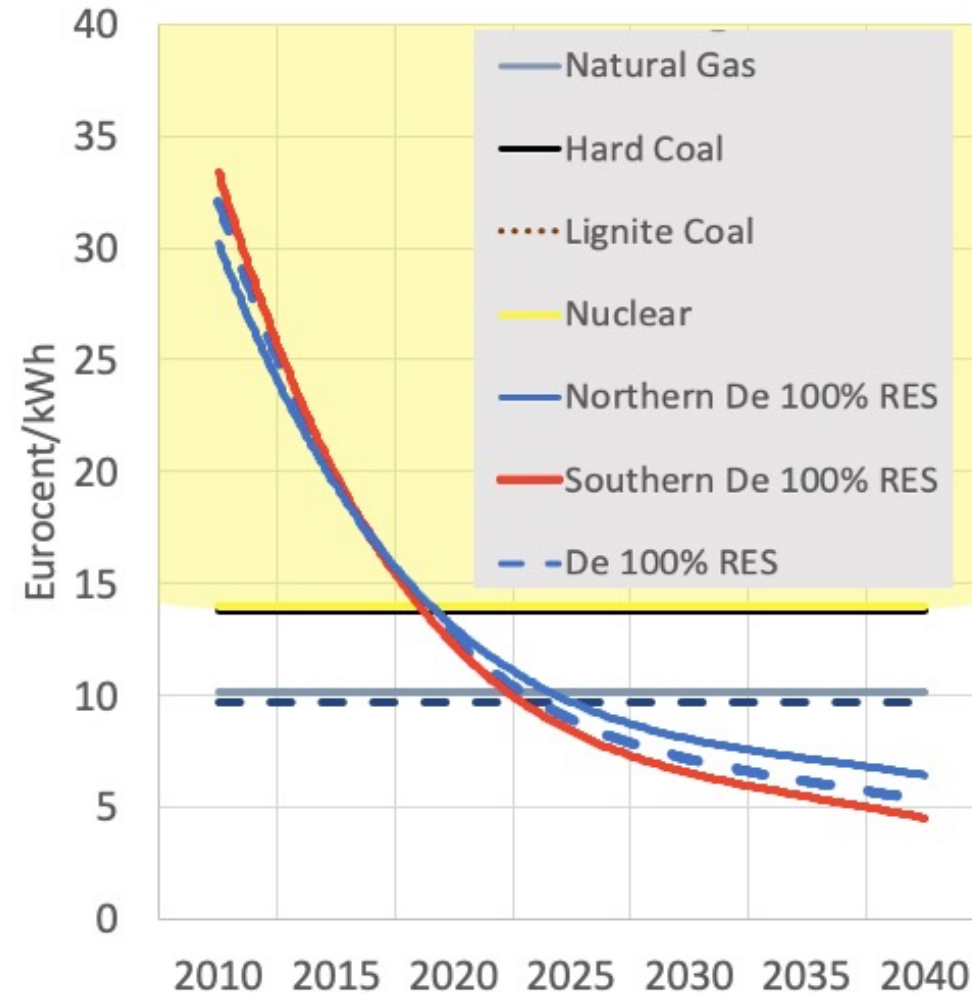
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Low costs foundational for climate mitigation by 100% renewable energy systems

Costs drop of reliable 24&7 renewable systems:

Costs of full RES System decisively low and falling

Sunny India even lower

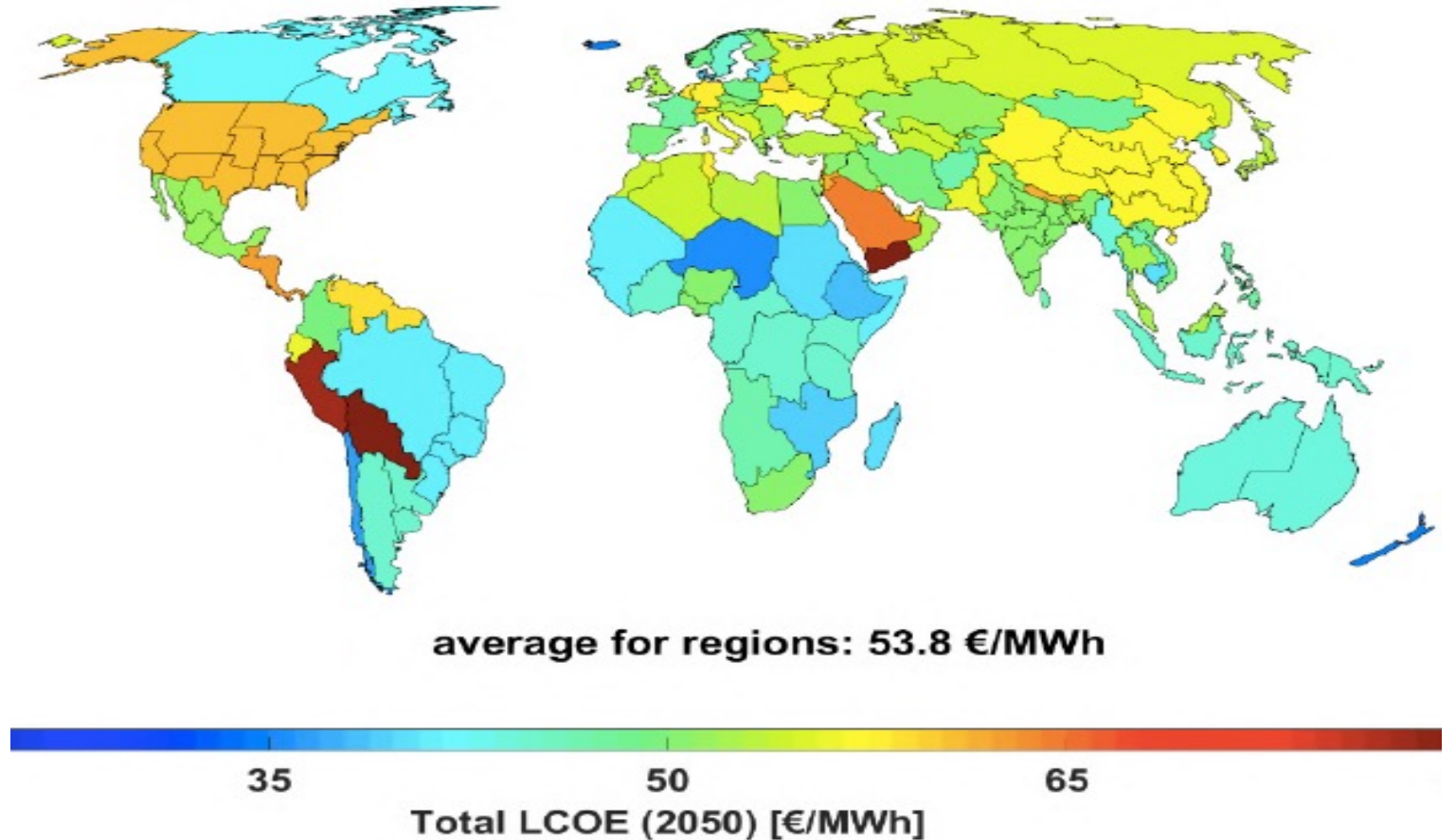


Source: EWG forthcoming.

Global Overview of 100% RES cost perspective

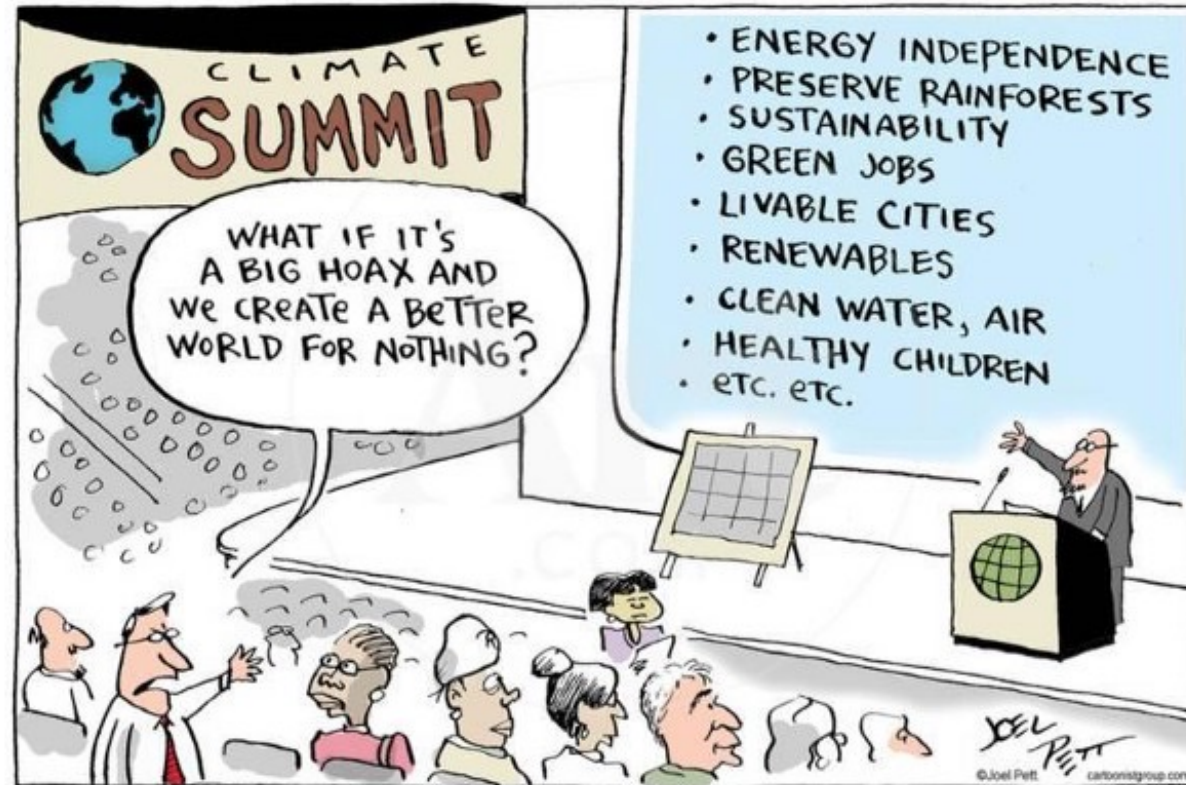
Low costs of RES in India

Medium in China and Germany



Regional variation of the levelised cost of energy on a global scale in 2050.

Saving the world at no costs



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Outline

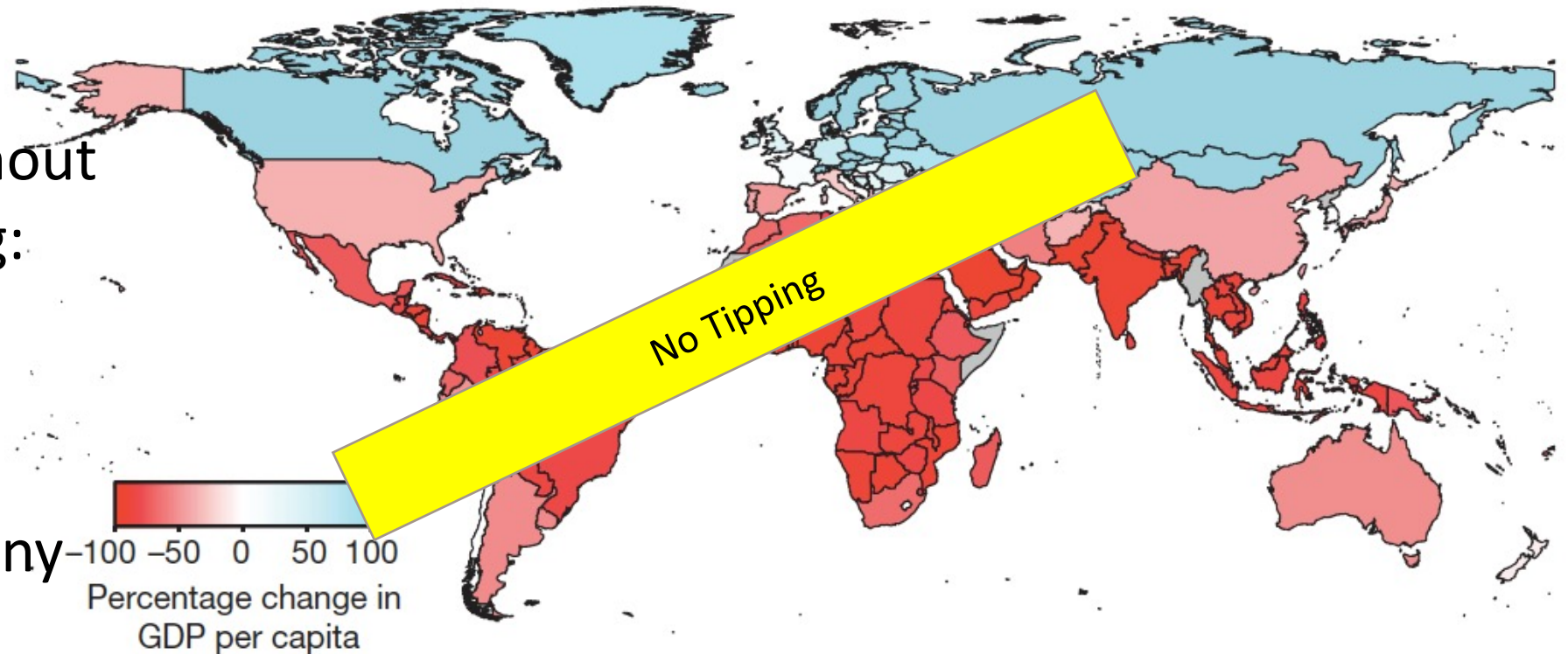
- Global overview of damage and RES resources
- Risks, Renewables Status and Results for LCoE
 - a) India
 - b) Germany
- How to implement policy that trigger vibrant markets
- Wrap-up

Overview of climate damage perspective w/o transition

Damages 2015 without
catastrophic tipping:

Highest in India

“Modest” in Germany

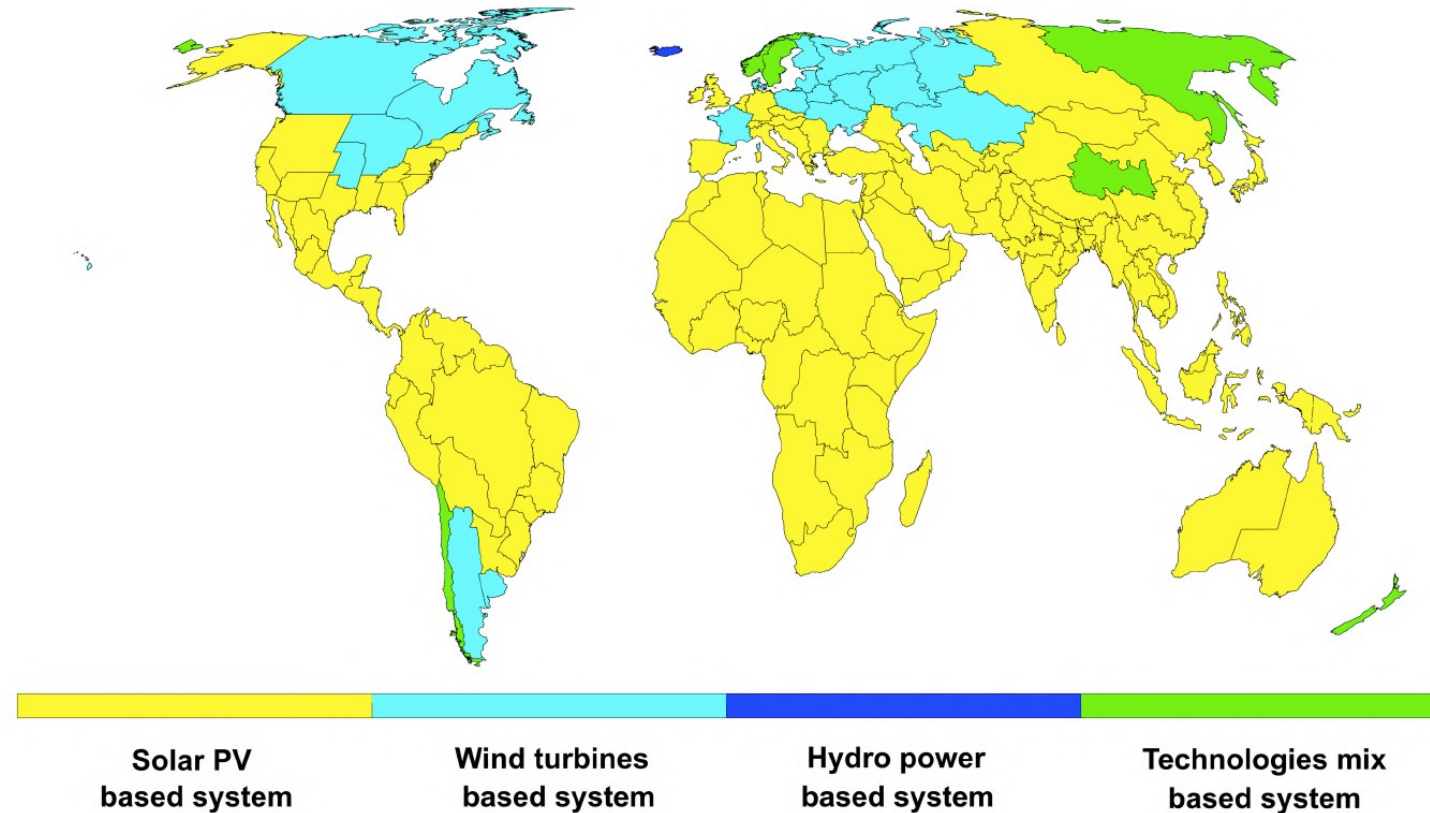


Regional breakdown of renewable energy carriers used in full transition

Germany:
PV based

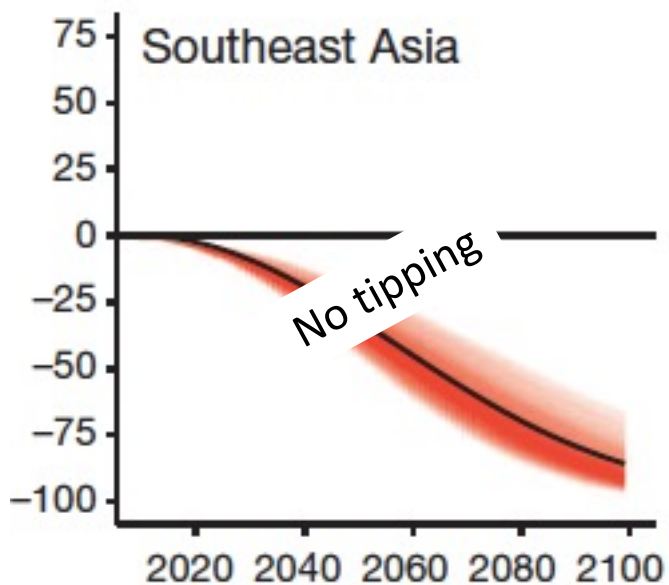
India:
PV based

Few wind
based
systems



India

India is exposed
to comparatively
high risk.
% change of GDP:



Source: Bourke (2015)

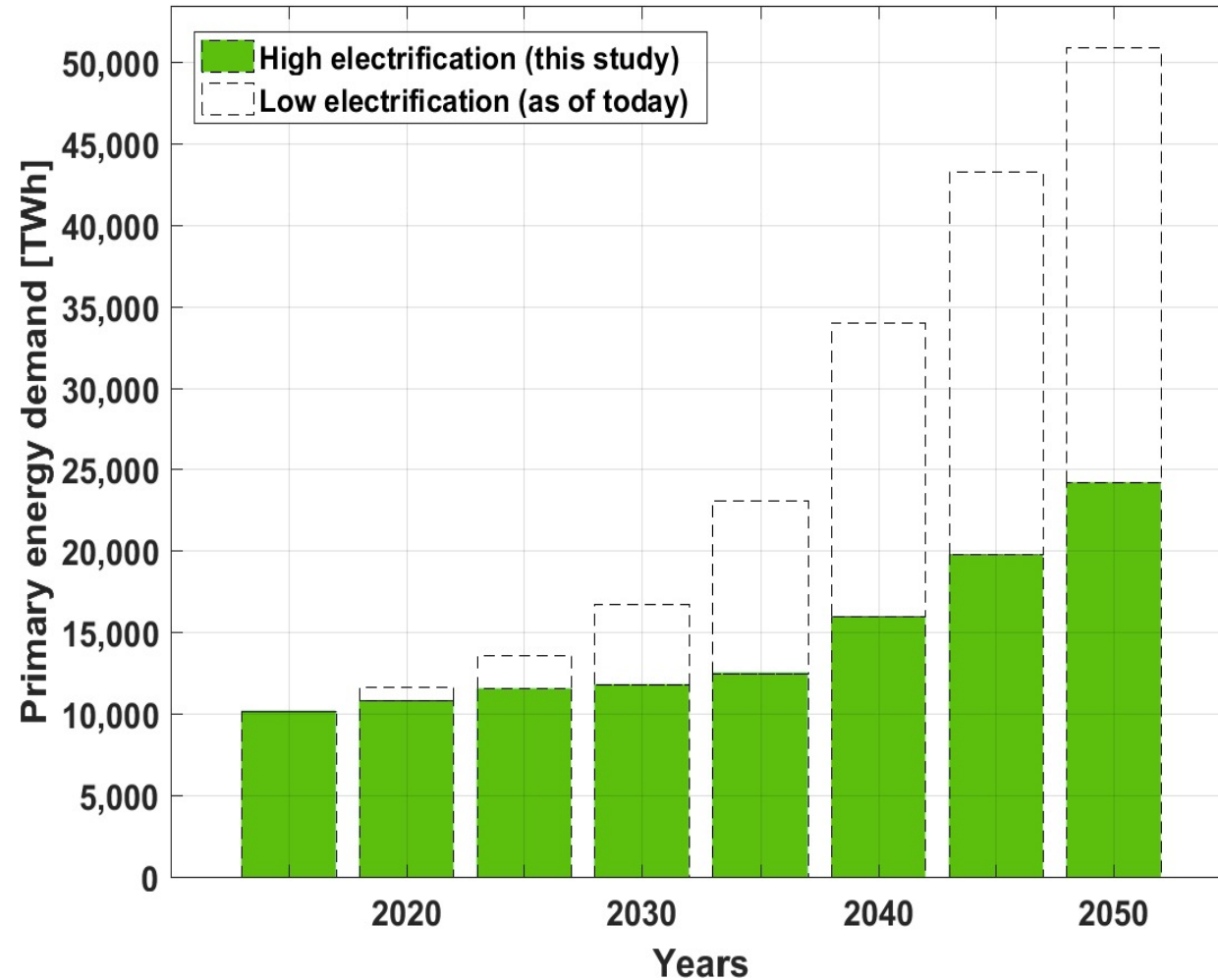


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SAARC and India: Electricity key to PED saving

High efficiency
savings
by electrification

Tremendous energy
service growth

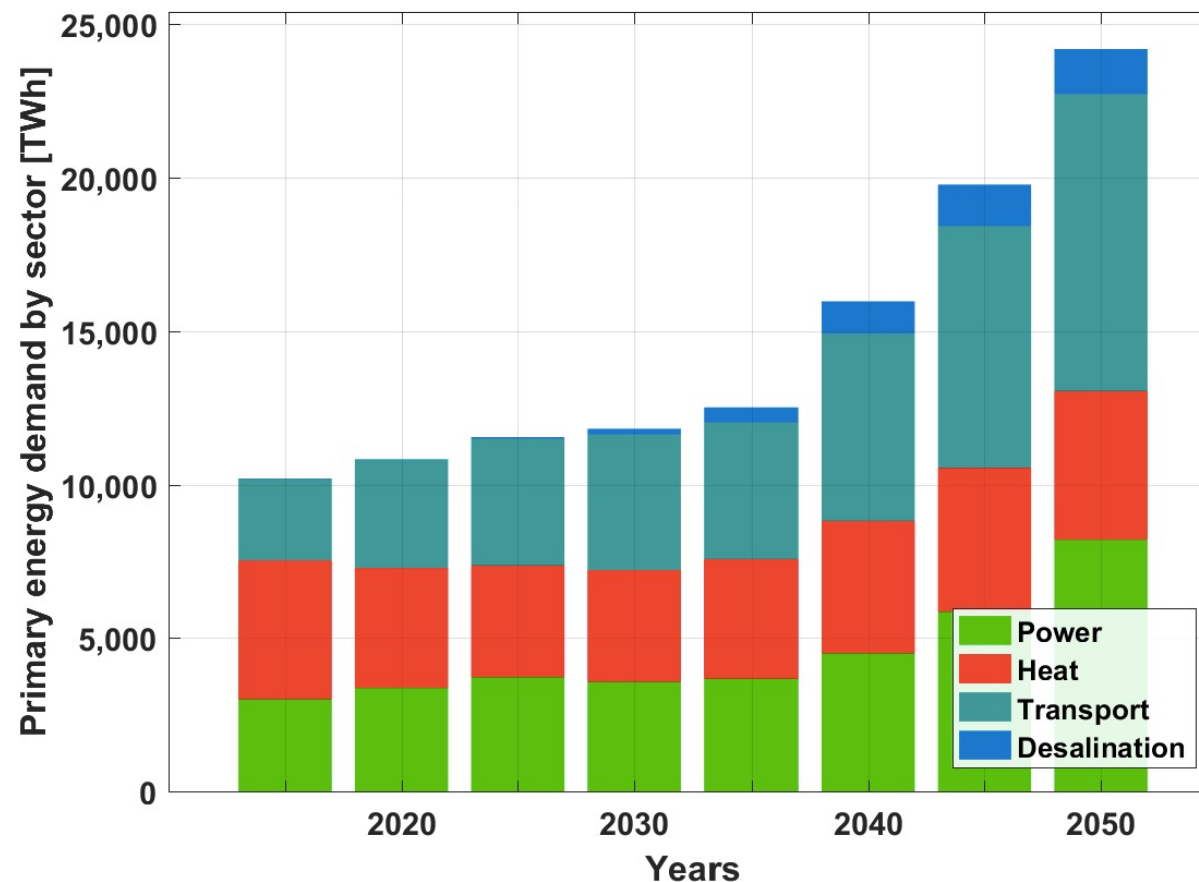


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Source: EWG-LUT (2019)

SAARC primary energy demand by sector

Low share of heating
In 100% RES system
(about 21%)



SAARC Afghanistan, Pakistan, India, Nepal, Bhutan,
Bangladesh, Sri Lanka

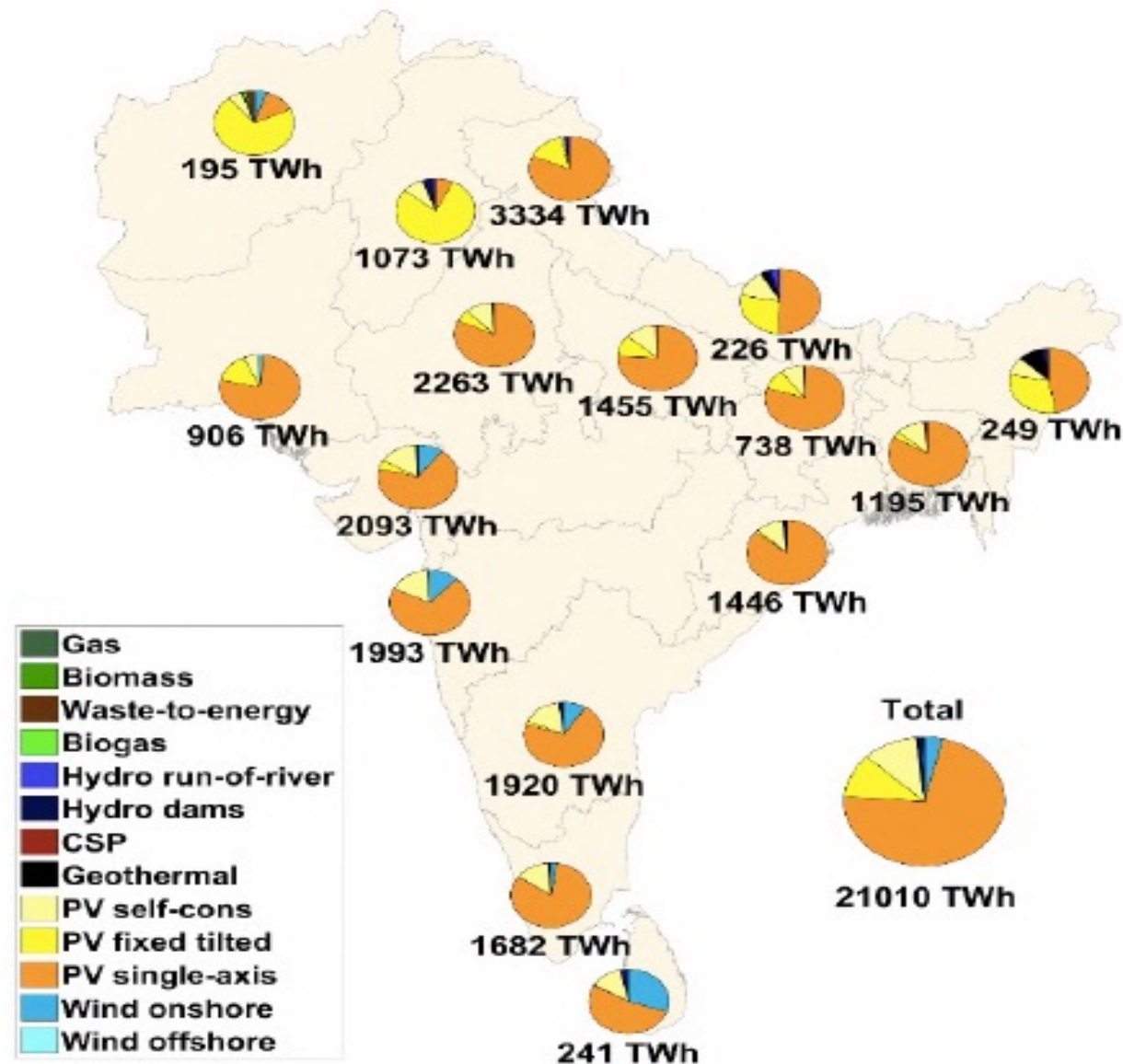
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Source: EWG-LUT (2019)

SAARC and India: Highest share of PV of 95%

Notably:
Highest shares of
Single Axis PV

Facilitating lowest cost
decentralisation

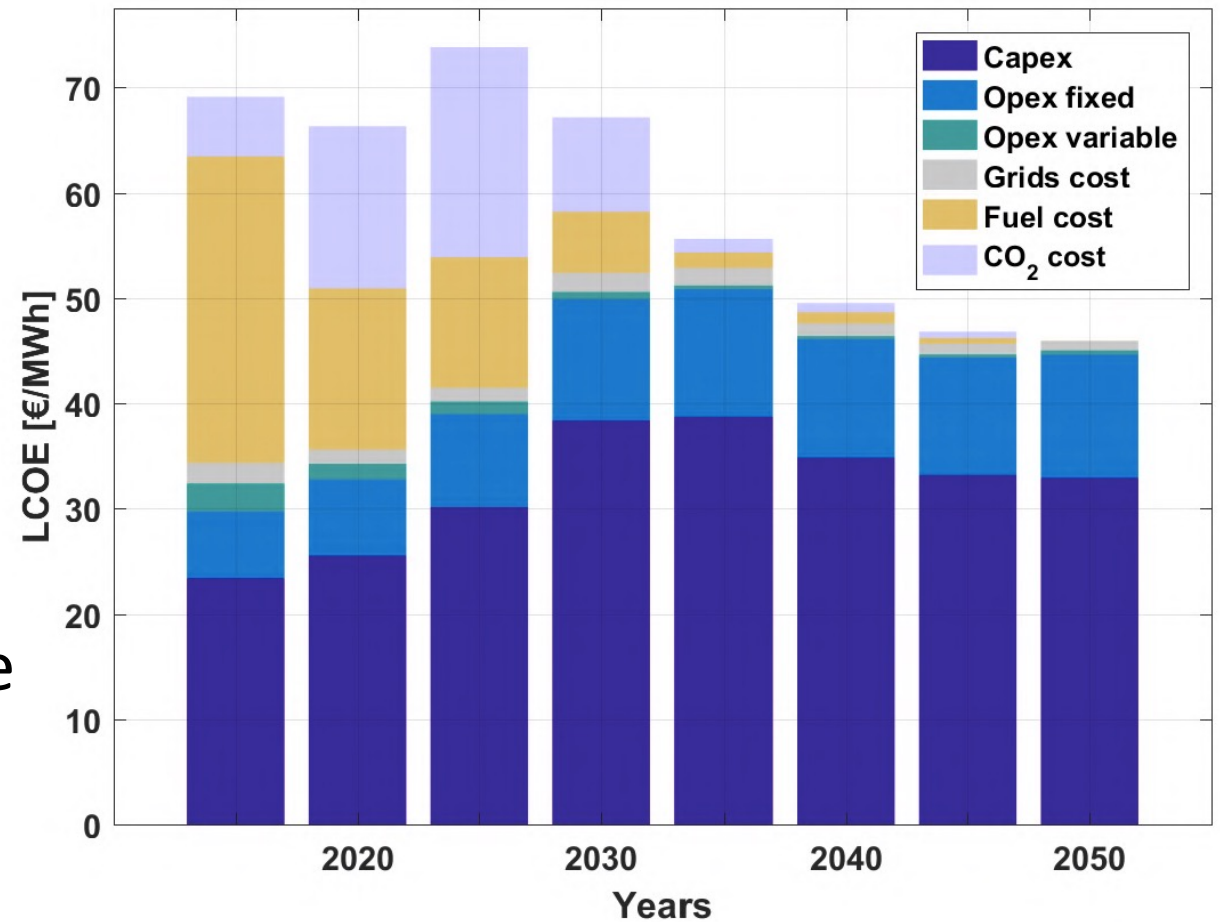


SAARC and India: The price

From 2025 full costs are falling

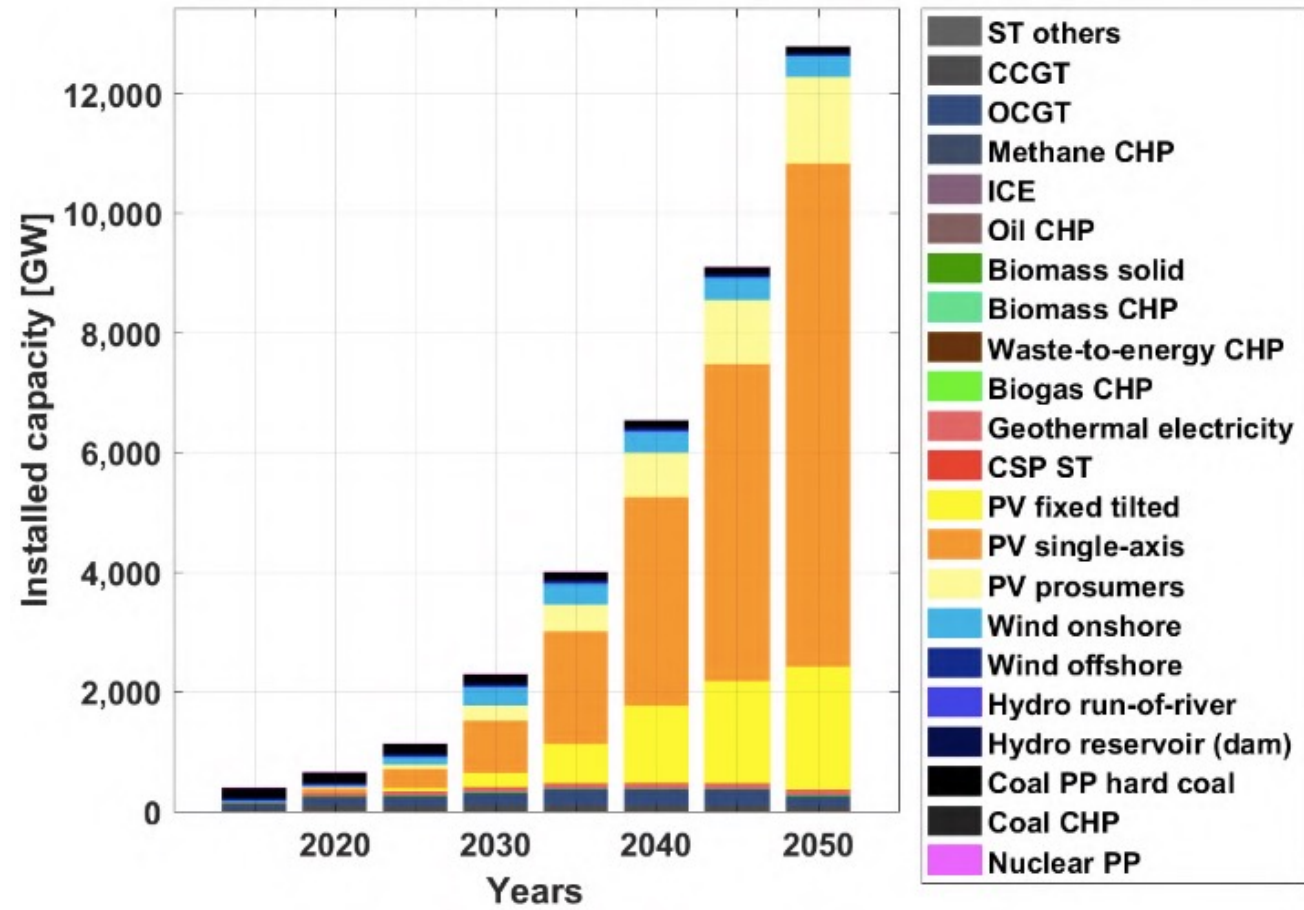
Larger emissions
quantity effect than price effect

Emission costs = Emissions x Price



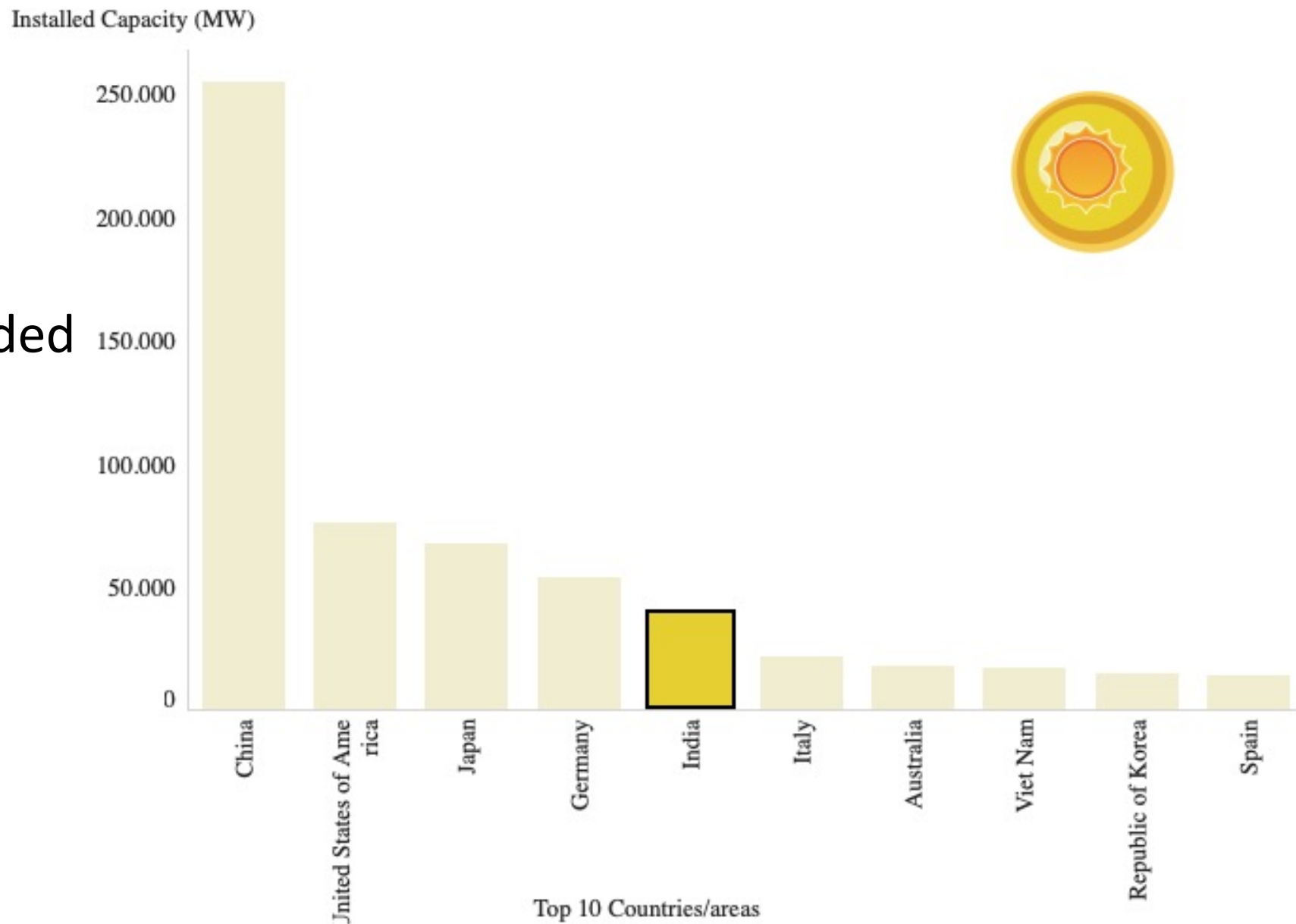
SAARC capacity development

India: around
9000 GW of PV
Necessary for full
RES System



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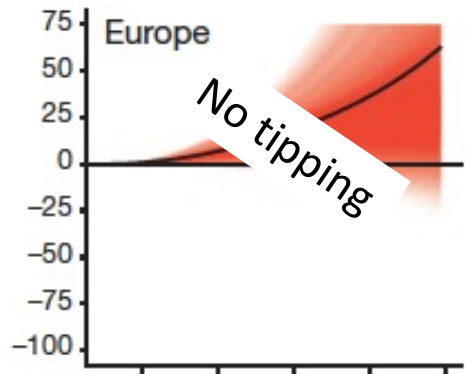
A factor of 200 needed





Seemingly low
damage

% change of GDP:



Social tipping:
High perception of
migration risk and
species losses –

Risk medium to high

Europe

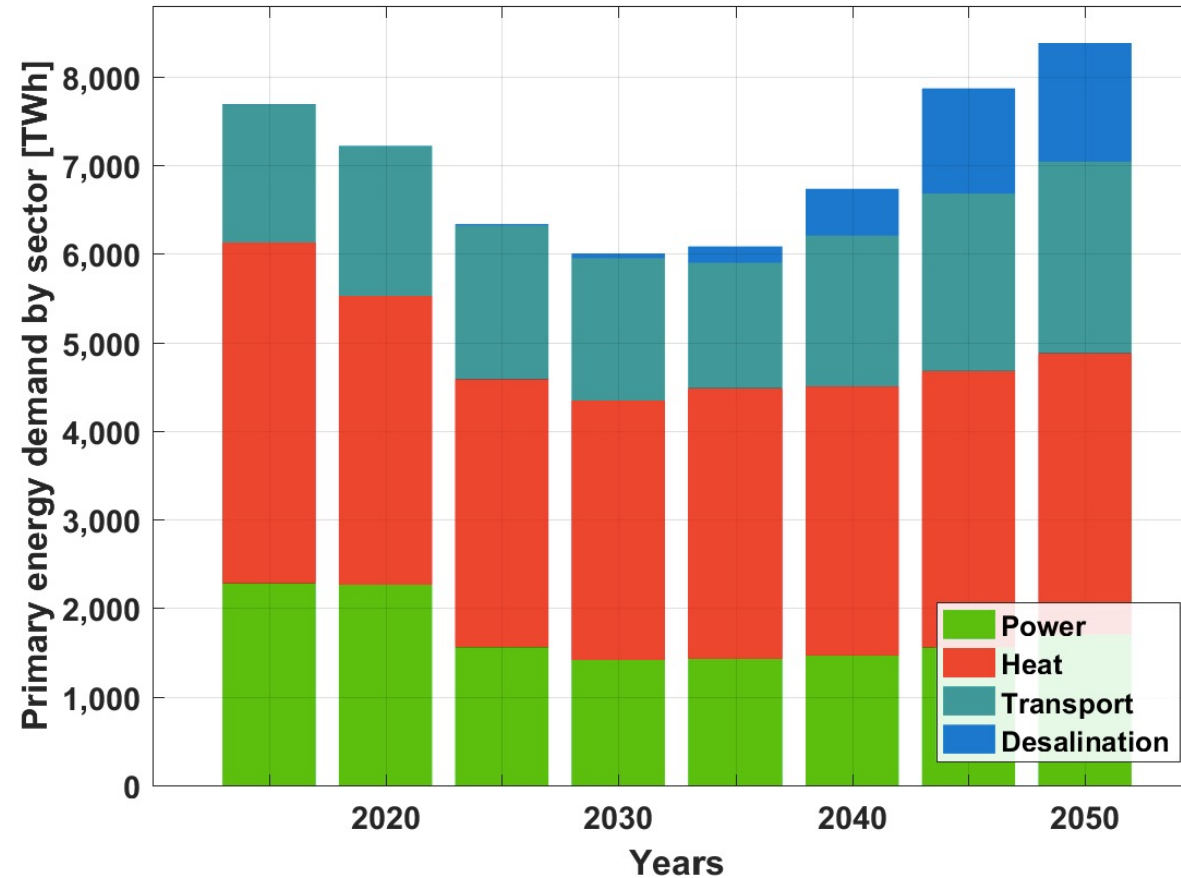


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Europe primary energy demand

Heat demand dominates European energy system today

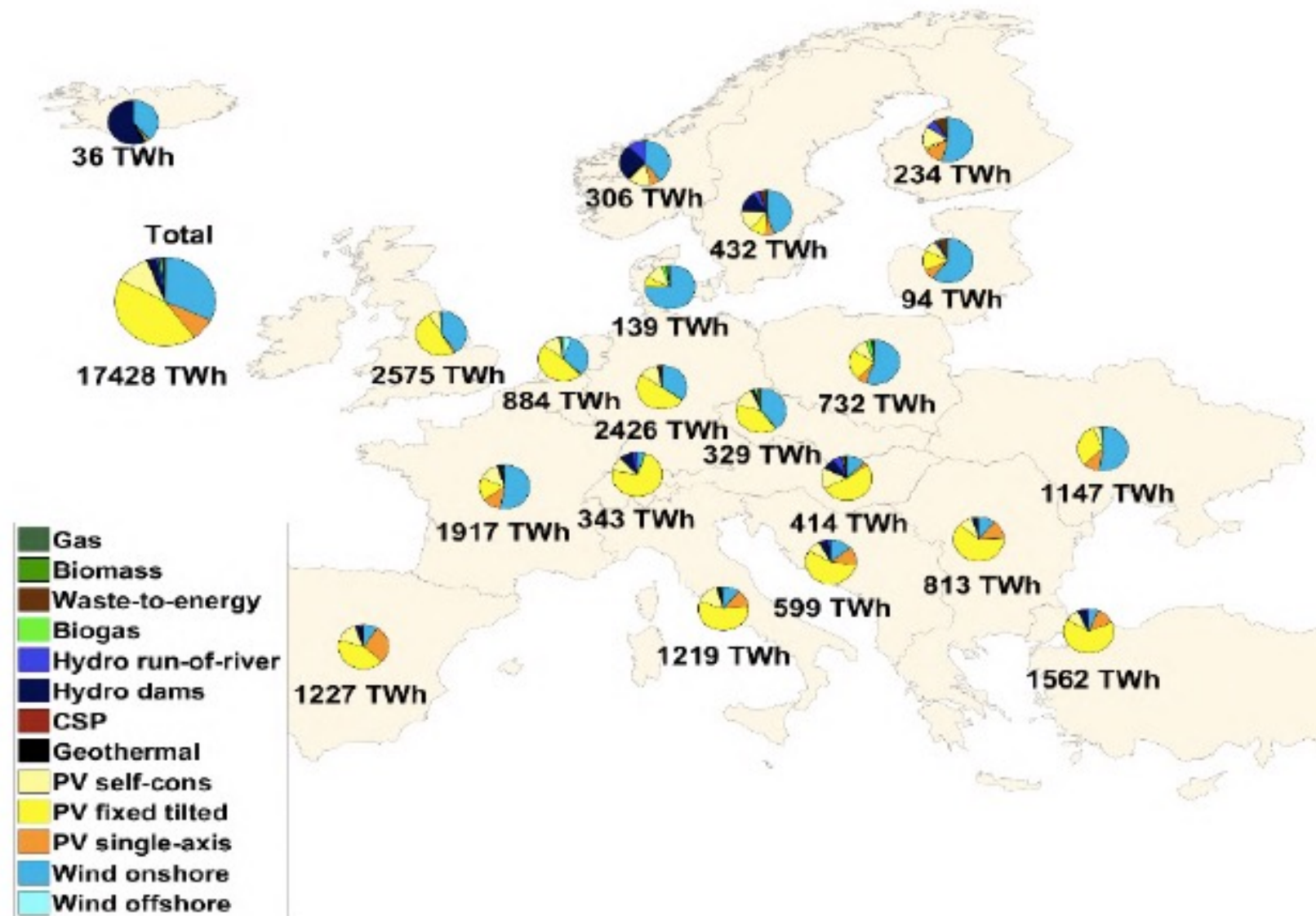
Keeping 33% at 100% RES



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High share of Wind
Of up to 75% in the Northern
Half of Europe

Up to about 90 % in the South



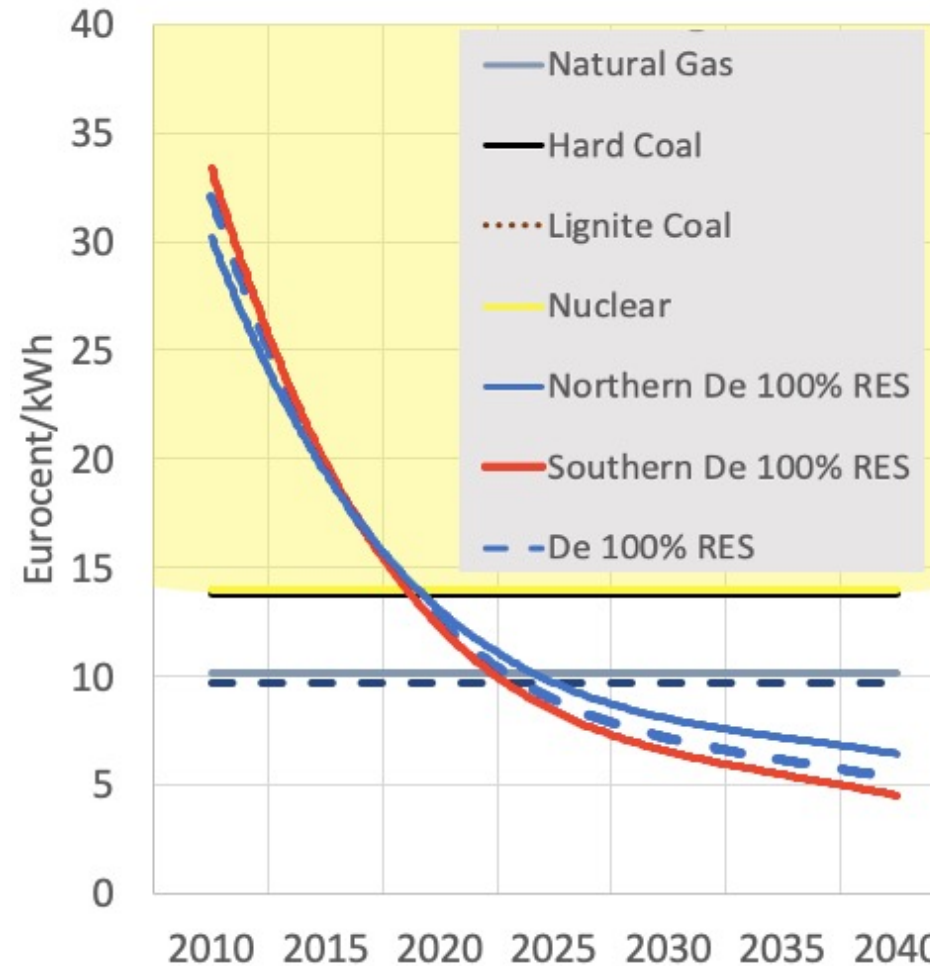
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Renewable energy system costs outcompete fossil and nuclear energy systems

New projects of RES soon cheaper than any other technology (and grid costs of centralized system)

From 2030 also cheaper than operating an existing conventional plants

This holds for „sunny“ South as well as the windy North

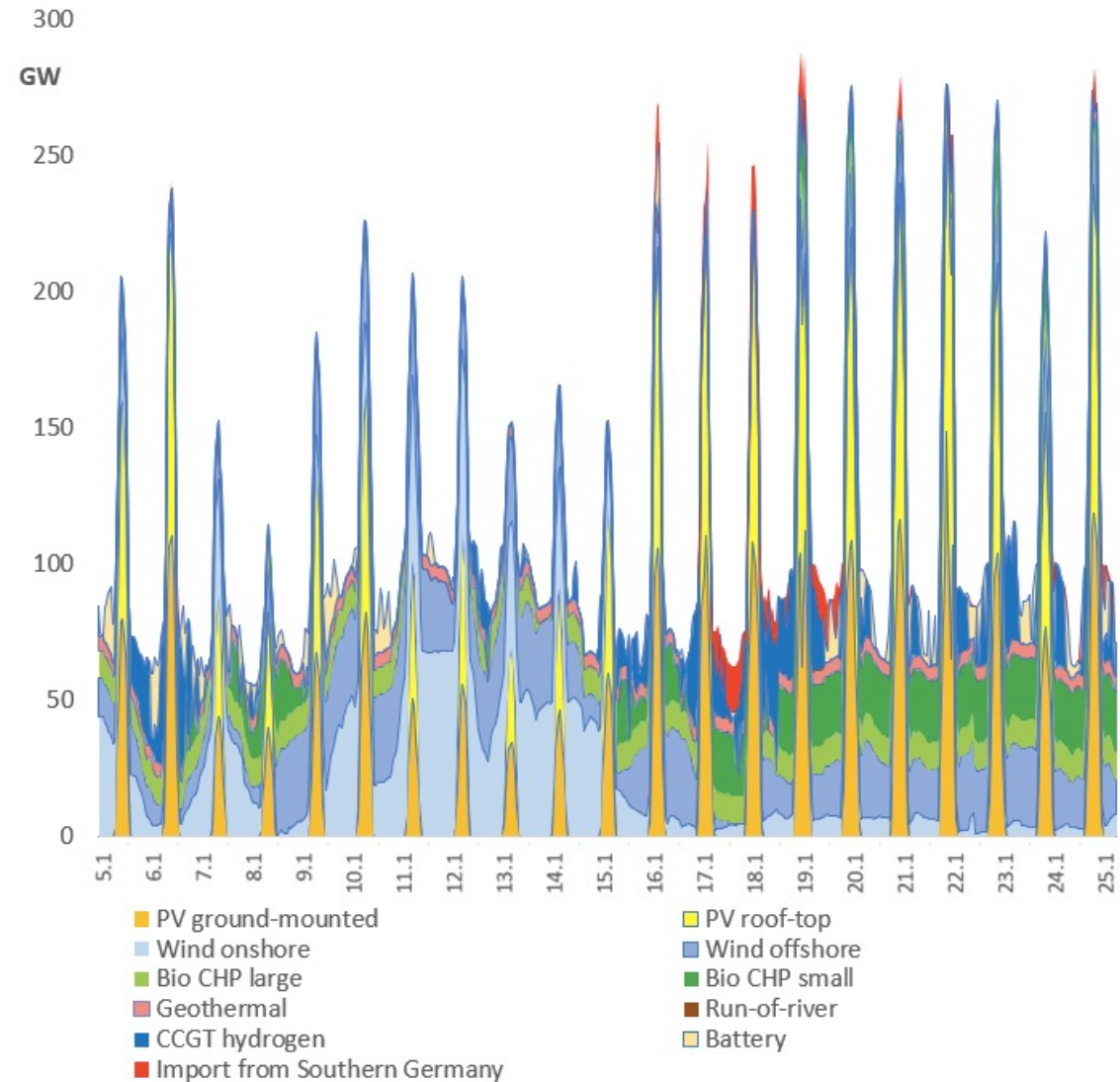


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Example: Northern Germany

Biomass, Hydrogen, Imports

Sun complementing wind
and vice versa

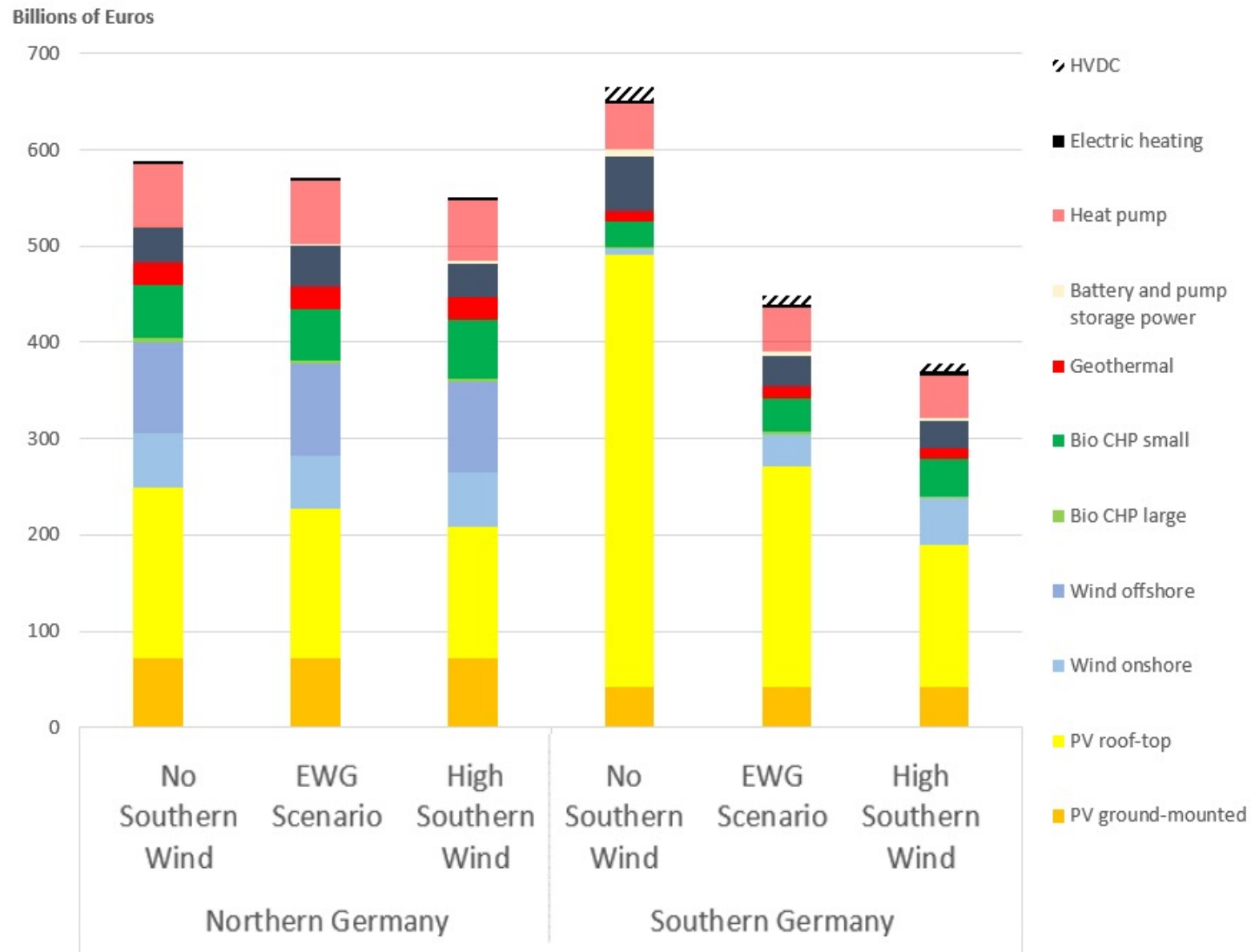


Wind cost decisive ingredient also for the South

Costs in South
highly depending on
Wind roll out

Storage Costs around
20 to 25%

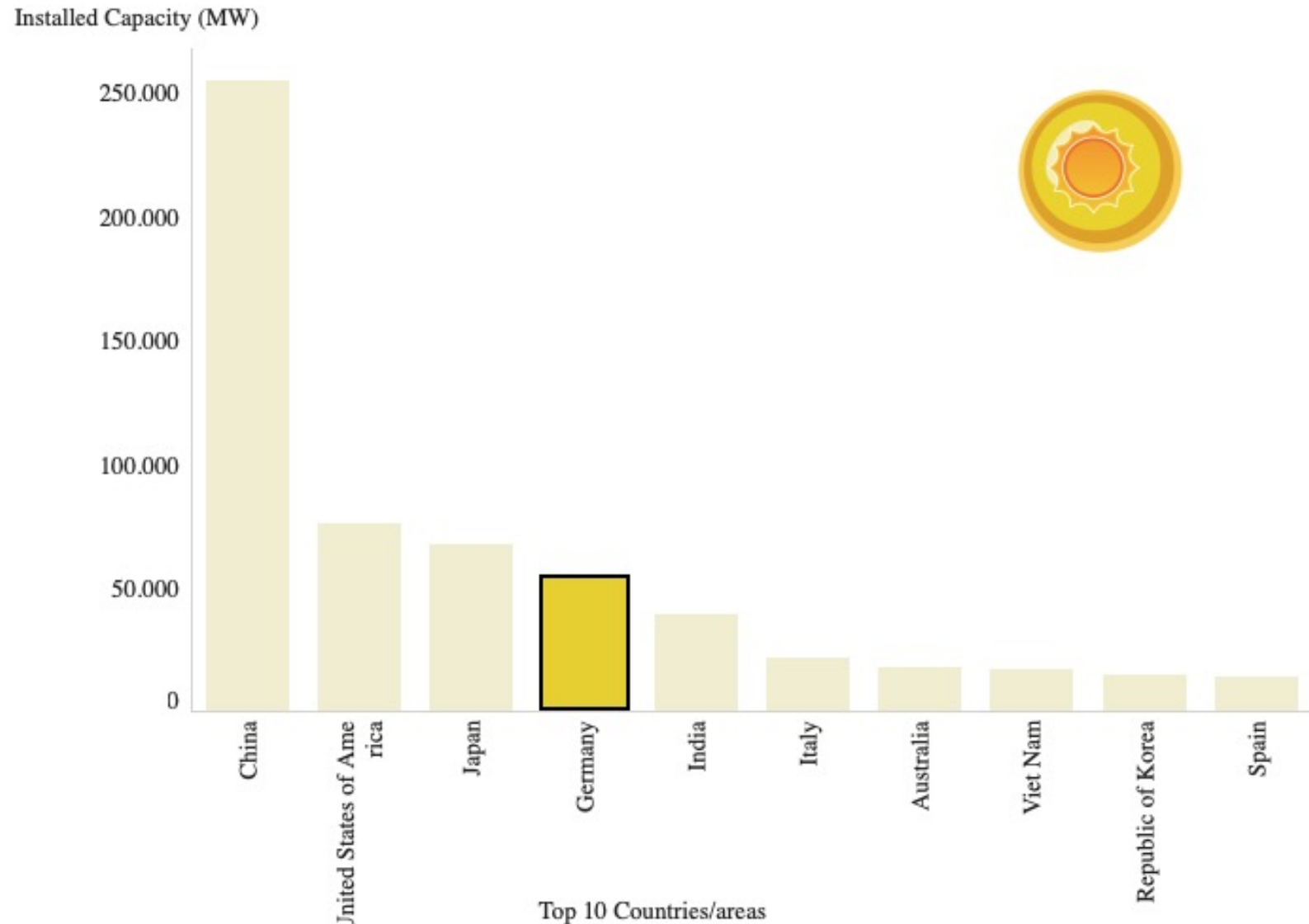
Low share of additional
High voltage grid



PV installed far from being sufficient in Germany

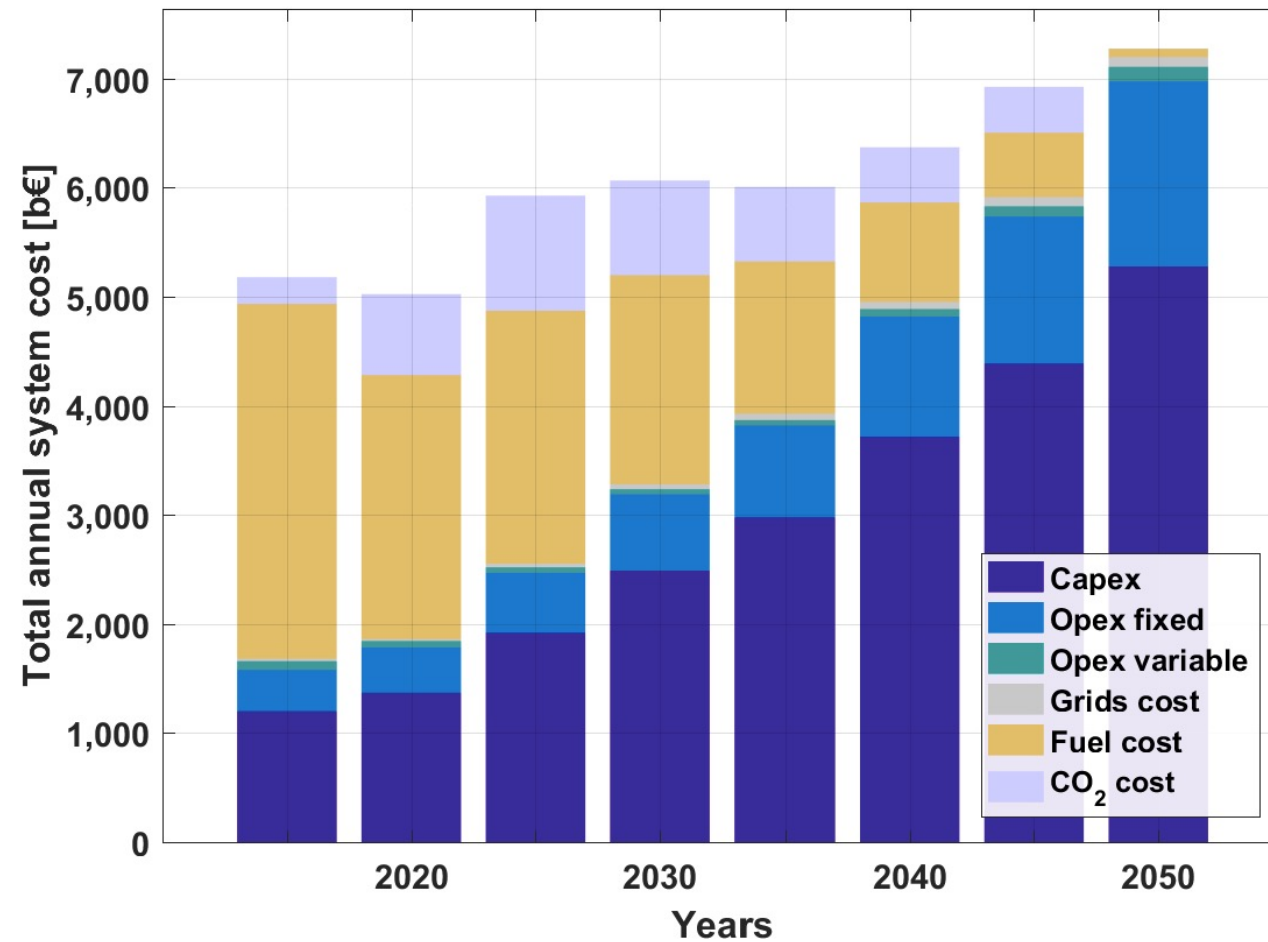
Although
#4

Germany needs
order of
magnitude leap
to
800 GW Paris'
compatible by 2030



Investments globally needed

67 Trillion Euro for transition needed



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Policies

- German job losses due to erratic policy in the tens of thousand.
- Auctioning of support + grid connection induces boom and bust cycles
- Hard for citizen projects to participate
- High policy risk for small investors
- Support of reliable energy necessary that should takes over part of the risk into governmental or private pooling (See EWG 2020 on legislative initiative)

Wrap up

- PV the king of affordable, decentralized full energy systems worldwide
- @ further falling yet already competitive costs
- Policies stand in the way of transition and must facilitate local action
- Other sectors must follow: Cement, Iron, Food, Forestry



Says
Thank You!

Projects for 100%RES: From village to continent

https://www.energywatchgroup.org/wp-content/uploads/EWG_Key-points-of-a-legislative-initiative-for-reliable-adequate-renewable-energy-supply.pdf

https://www.energywatchgroup.org/wp-content/uploads/EWG_LUT_100RE_All_Sectors_Global_Report_2019.pdf

EWG Study: EWG (2021, German only) Study on Germany in Journal *Energies*

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Thank you for your attention!