

*100% Renewables is the Peace
Strategy for Korean Peninsula*

Seoul 30th October 2018

Hans-Josef Fell
President Energy Watch Group
Member German Parliament 1998-2013

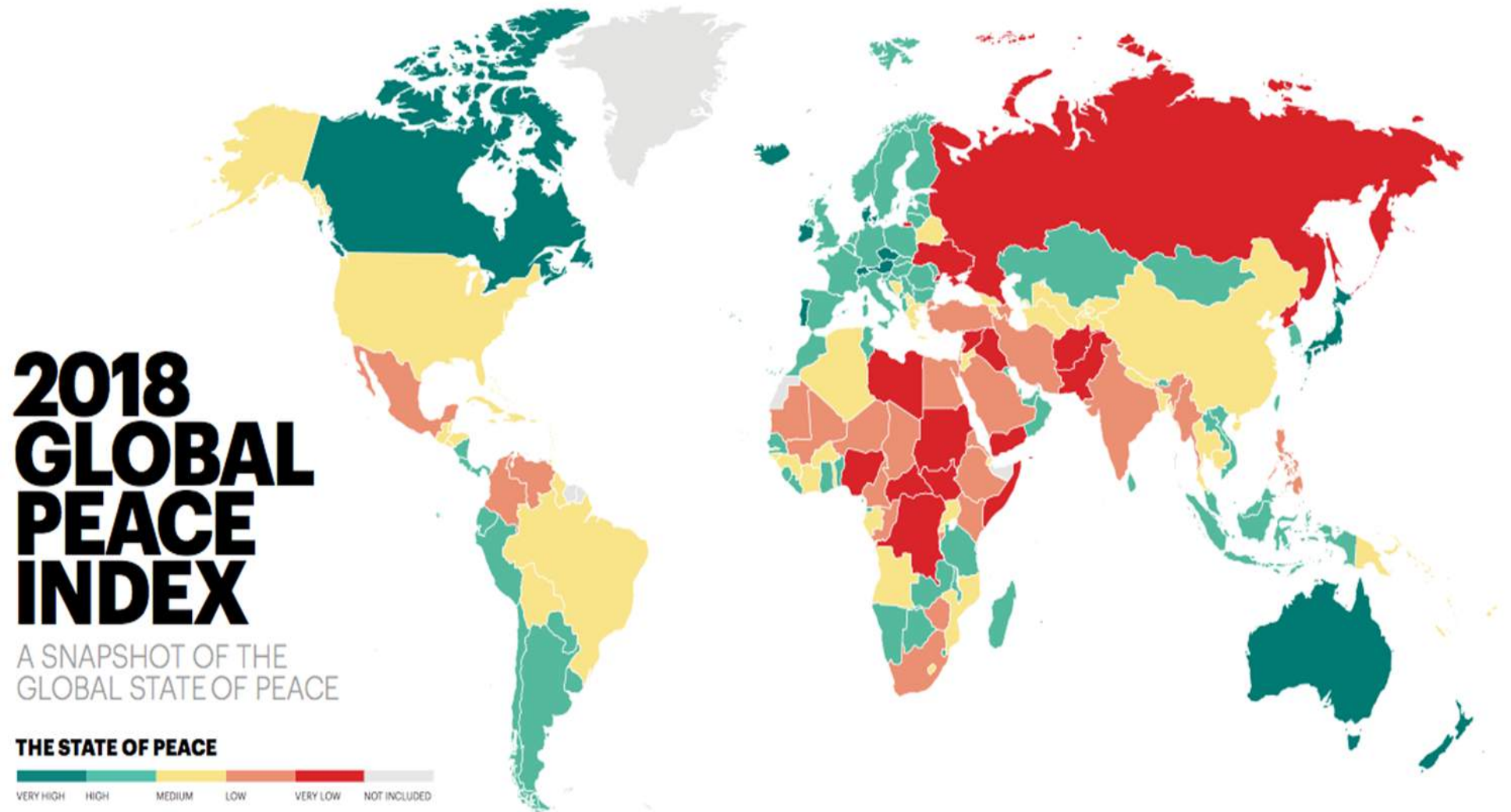
Current political challenges

- Global warming, loss of biodiversity
- Peak oil, energy security
- Nuclear and environmental disasters
- Oil wars, poverty, refugees, economic crises

→ All these challenges are associated with fossil and nuclear energies

Good news: Renewables will solve these problems!

Where oil is, is often war



Source: Institute for Economics & Peace. Global Peace Index 2018: Measuring Peace in a Complex World, Sydney, June 2018. Available from: <http://visionofhumanity.org/reports>

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Nuclear power is the source for nuclear disasters and nuclear weapons



Hiroshima
1945



Chernobyl
1986



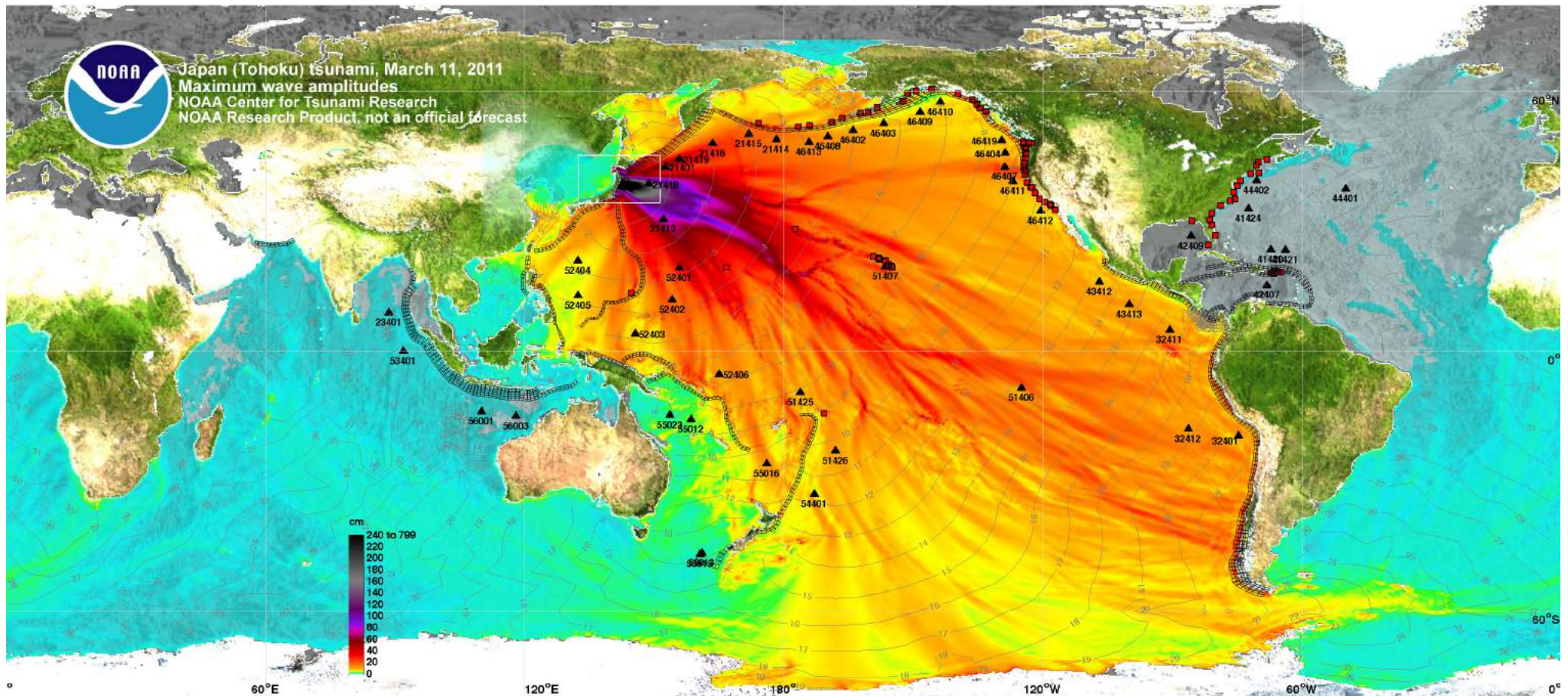
Fukushima
2011

Sources:

- 1)-2) BFlickr/Oldmaison, Tepco, 7.11.2012, Pripjat 2006
- 3) <https://www.telegraph.co.uk/news/worldnews/asia/japan/8863968/Fukushima-nuclear-disaster-timeline.html>

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Radioactive water in the pacific ocean



Fukushima nuclear radiation spread throughout Pacific Ocean

Source: NOAA/ PMEL/ Center for Tsunami Research, 2011. Available from:
https://nctr.pmel.noaa.gov/honshu20110311/honshu2011-globalmaxplot_ok.jpg

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COP21 target: Stop climate warming at 1,5° C

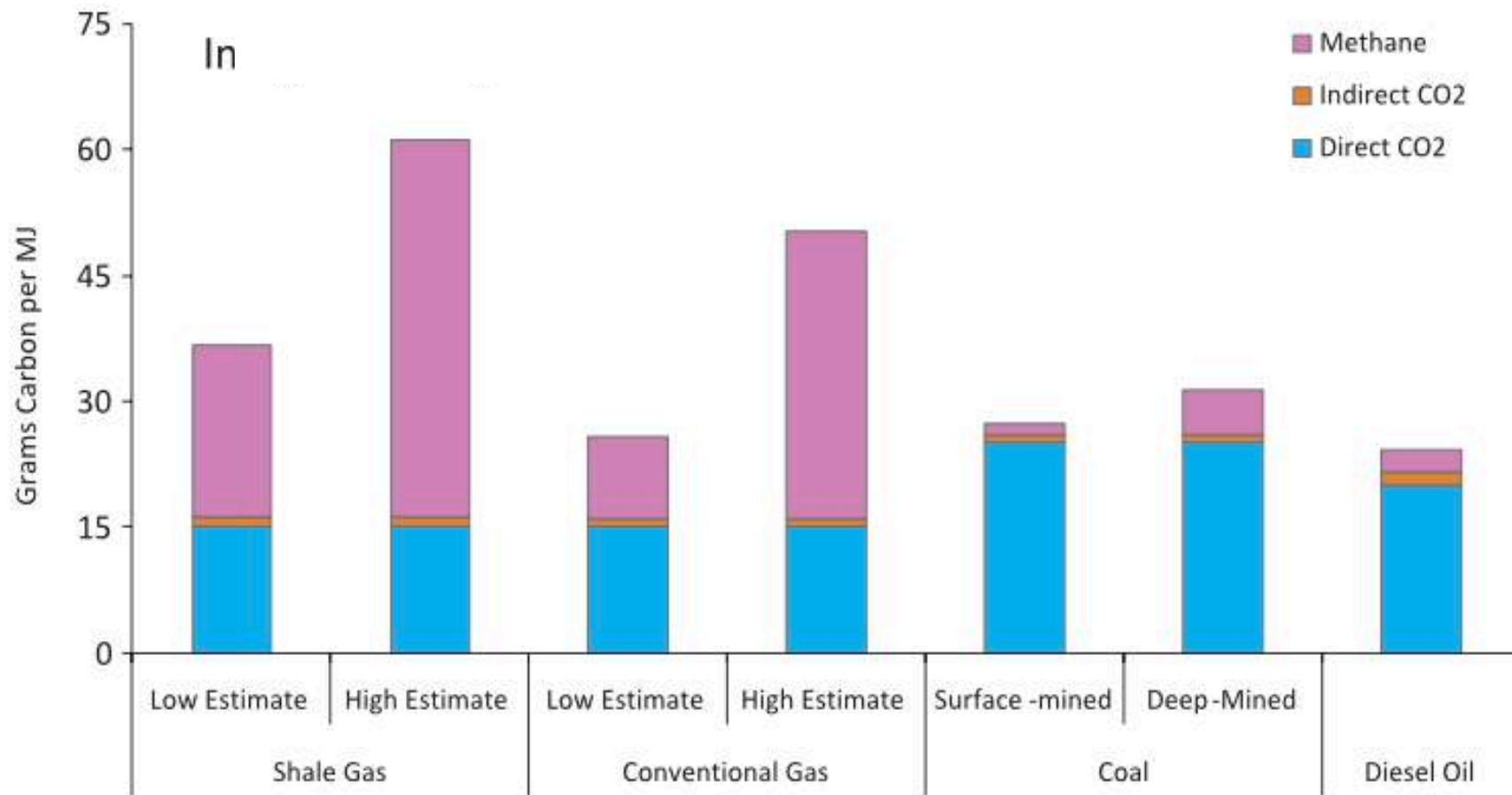
But today's warming of +1,3° C is already unacceptable: aridity and wild fires, floods and storms, sea level rising



The better choice is:
Global Cooling

Natural gas more climate-damaging than coal

Climate impact of different power sources, as in „A Bridge to Nowhere“, Howarth 2014



Source: Howarth, R. W., A bridge to nowhere: methane emissions and the greenhouse gas footprint of natural gas, Cornell University, 2014
 (<http://onlinelibrary.wiley.com/doi/10.1002/ese3.35/epdf>)

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Crises of climate warming and peak oil can only be solved with two parallel strategies:

1. Stop greenhouse gas emissions

(not only a reduction of emissions)

- Switch to 100% renewables
- Completely stop the use of fossil and nuclear energies in energy, chemistry, transport, agriculture

2. Take out carbon from the atmosphere

- Convert plants to humus soil (biocoal)
- Reforest big areas, green the deserts
- Organic agriculture

The target must be 330 ppm CO₂

This leads to global cooling, instead of global warming

Hydrothermal carbonization (HTC)



Input: plants, organic agriculture and municipal waste

Output: biochar

Usage of biocoal

Fuel (e.g. in coal power)

Chemical base (oil substitute)

Fertiliser (carbon binding)



Agroforestry systems in Spain, UK, France and Italy



oak-wheat (E)



poplar-barley (GB)



poplar-wheat (F)



walnut-lucerne (I)

Afforestation at Mount Kundudu, Ethiopia by “Menschen für Menschen” Foundation



2013

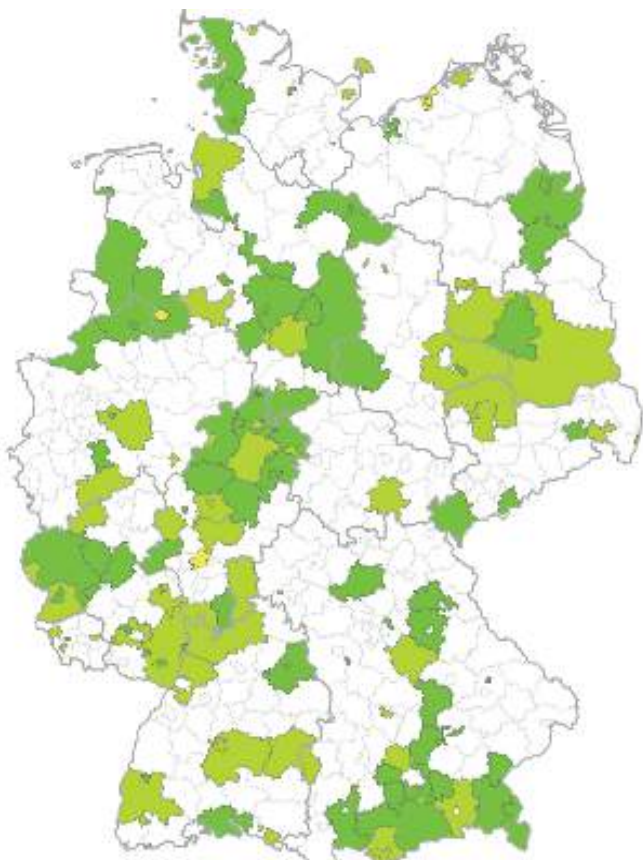


2016

10 million trees create habitat for 55,000
people at Kundudo Plateau, East Ethiopia

Double yield from one field: crops and solar electricity





**Nov 2016, COP22, Marrakesh:
48 countries (Climate Vulnerable Forum)
decided for 100% RE target**

*More Countries e.g.: Denmark; Sweden;
Costa Rica; Iceland; Cape Verde*

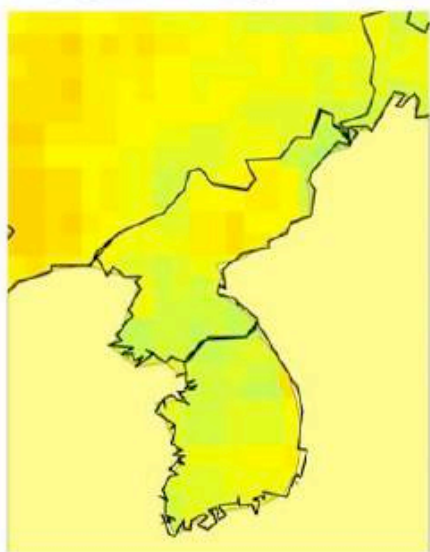
Cities with 100% RE target e.g.:
*Barcelona; Masdar City; Munich; Msheireb;
Downtown Doha; Vancouver; San
Francisco; Copenhagen; Sydney; Lemberg*

Companies with 100% RE target e.g.:
Google, Coca-Cola, Ikea, Walmart

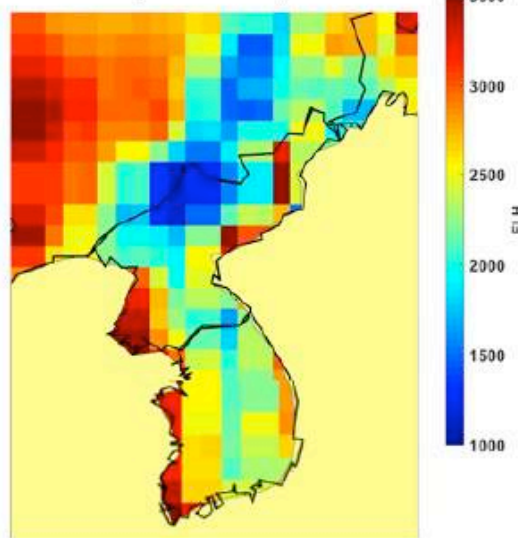
100% Renewable Energy for Korea

Basis for peace, prosperity, green growth

PV (single-axis tracking) full load hours



Wind onshore (E101 at 150m) full load hours

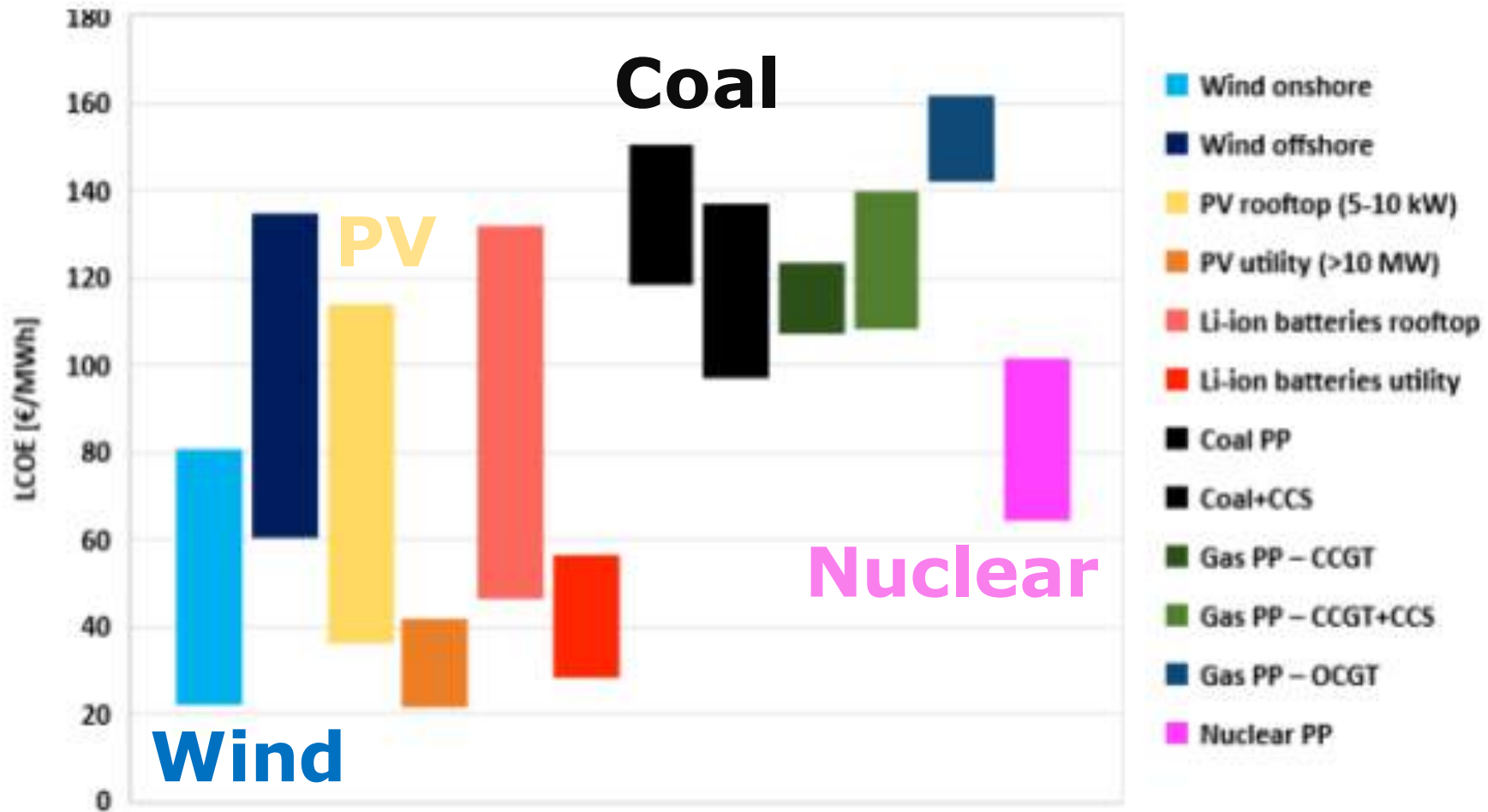


EWG/LUT/GGGI
offer a scientific
simulation for
100% RE in Korea

Sponsors are
welcome!

Renewables are energy for peace!

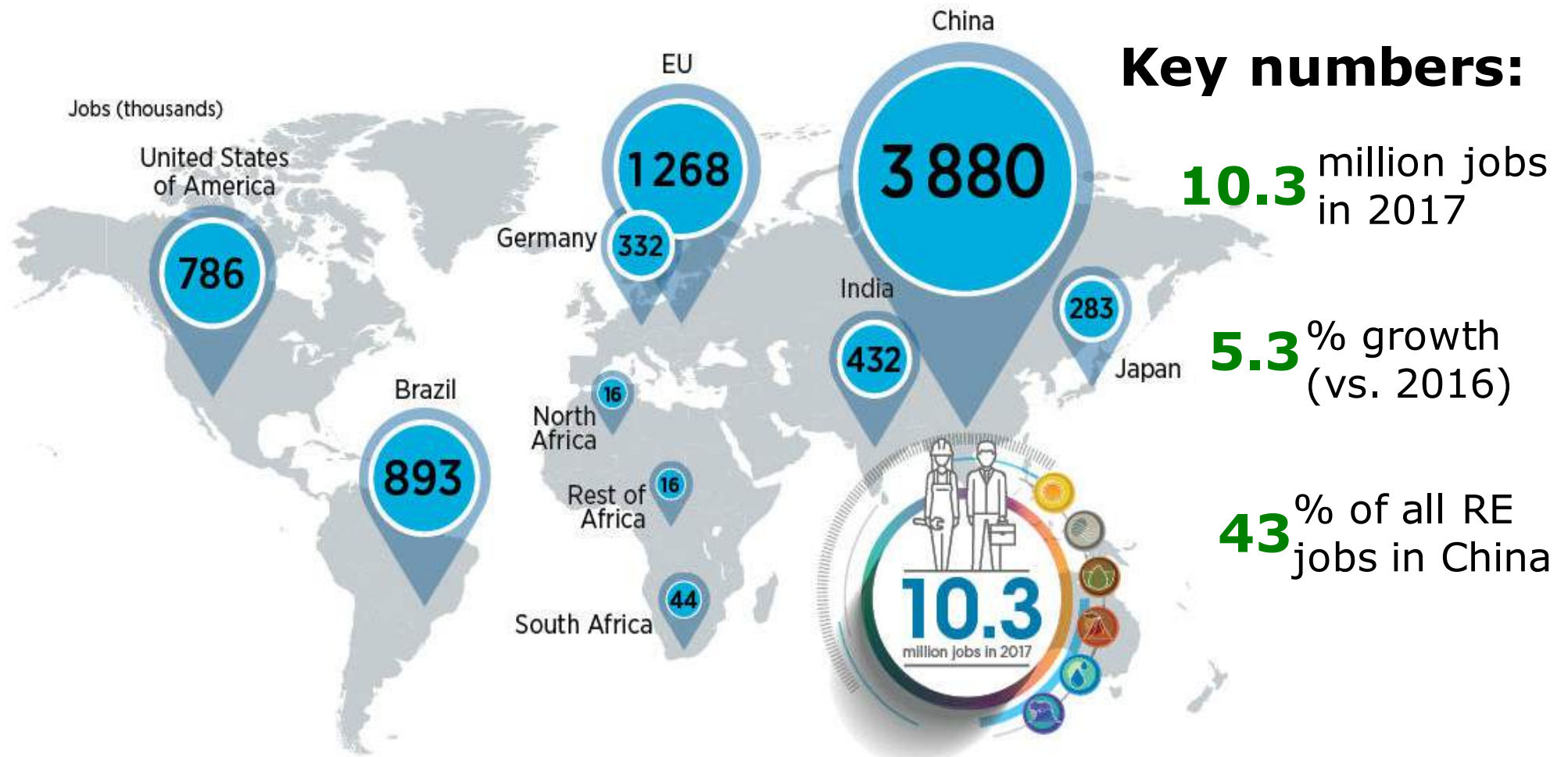
PV and wind power = cheapest energy in G20 States by 2030



Source: PV Magazine, 2017. Available from: <https://www.pv-magazine.com/2017/07/07/wind-solar-to-be-cheapest-power-source-in-g20-by-2030-greenpeace-study-finds/>

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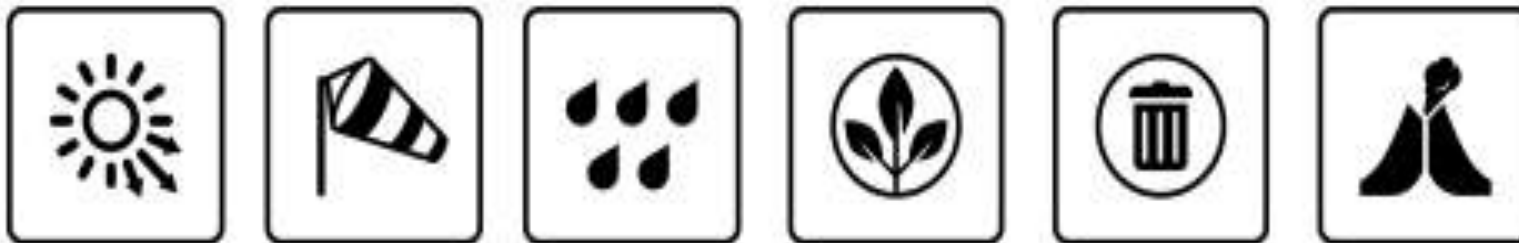
Renewable energy jobs reach 10.3 million worldwide in 2017, with most jobs in Asia



Source: IRENA, Annual Review 2018, Renewable Energy and Jobs. Available from: <http://irena.org/publications/2018/May/Renewable-Energy-and-Jobs-Annual-Review-2018>

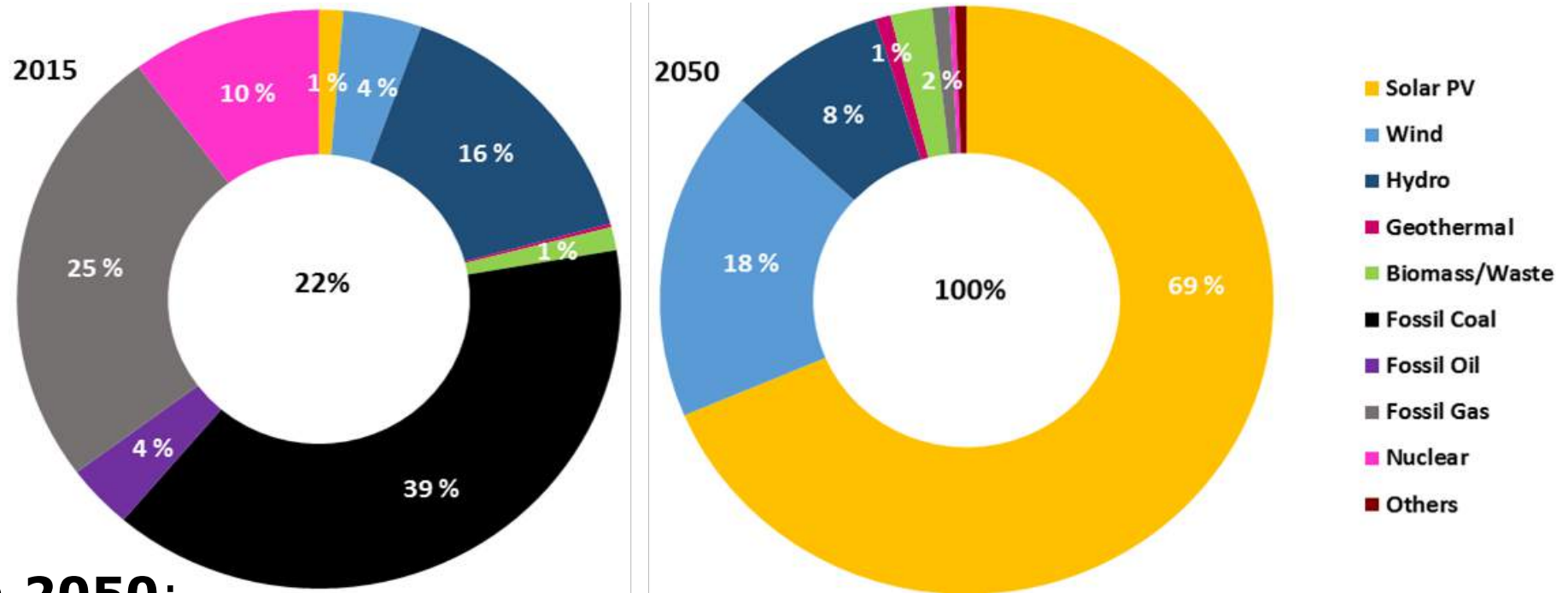
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Global Energy System Based on 100% Renewable Energy - Power Sector



Study funded by the
German Federal Environmental Foundation (DBU) and
Stiftung Mercator GmbH

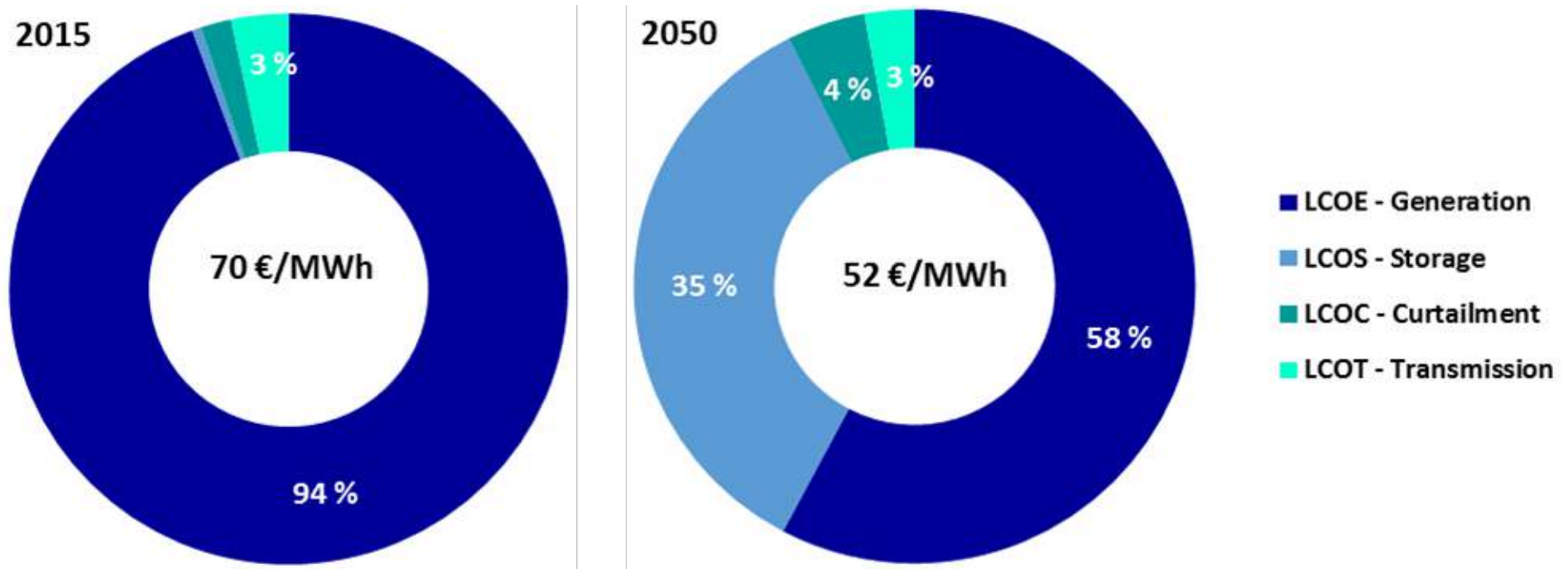
Electricity Generation 2015 and 2050



In **2050**:

- **Solar PV 69%, wind 18%, hydropower 8%, bioenergy 2%** of total electricity mix globally
- Gas generation is only from renewable energy-based gas
- Nuclear power still accounts for negligible 0.3% of the total electricity generation, due to the end of its assumed technical life, but could be phased out earlier

Renewable electricity is cost-efficient



- Total levelized cost of electricity (LCOE) on a global average for 100% renewable electricity is **€52/MWh in 2050** (incl. curtailment, storage and some grid costs), compared to **€70/MWh in 2015**.

100% Renewable Electricity Simulation Northeast Asia by Lappeenranta University, Finland



Global 100% RE System: Northeast Asia

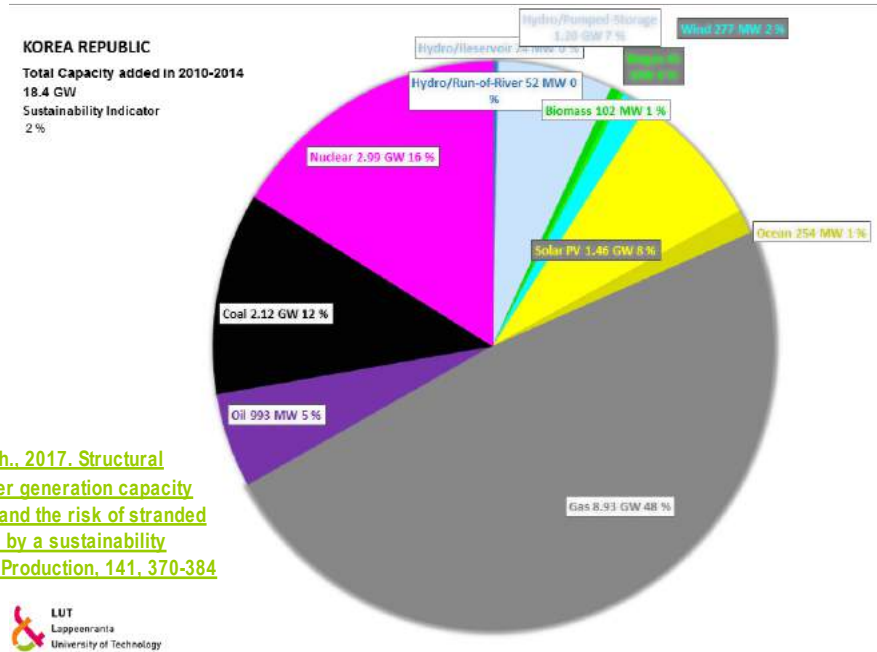
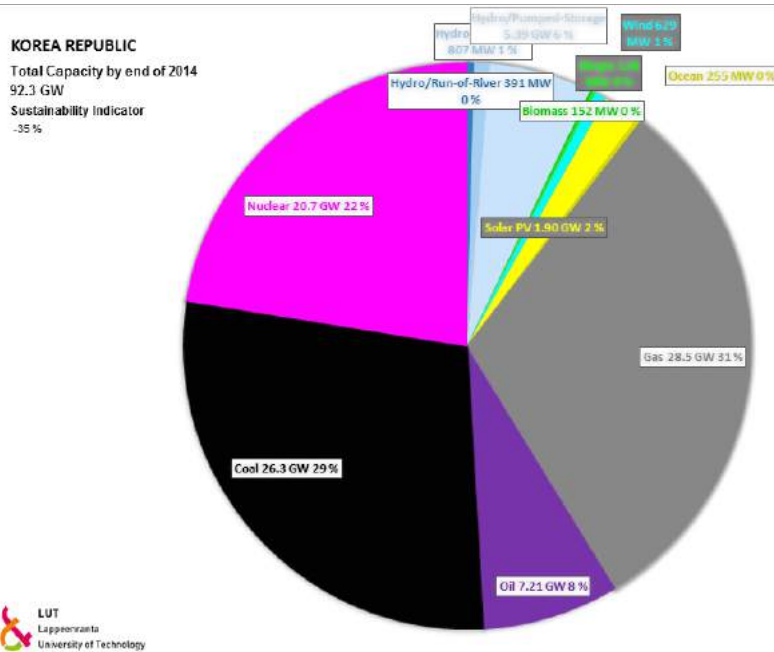
North Korea

https://www.researchgate.net/publication/320755773_Global_100_RE_System_Northeast_Asia_-_Korea_North

South Korea

https://www.researchgate.net/publication/320755587_Global_100_RE_System_Northeast_Asia_-_Korea_South

Republic of Korea - Power Plant Infrastructure



source:
[Farfan J. and Breyer Ch., 2017. Structural changes of global power generation capacity towards sustainability and the risk of stranded investments supported by a sustainability indicator; J of Cleaner Production, 141, 370-384](#)

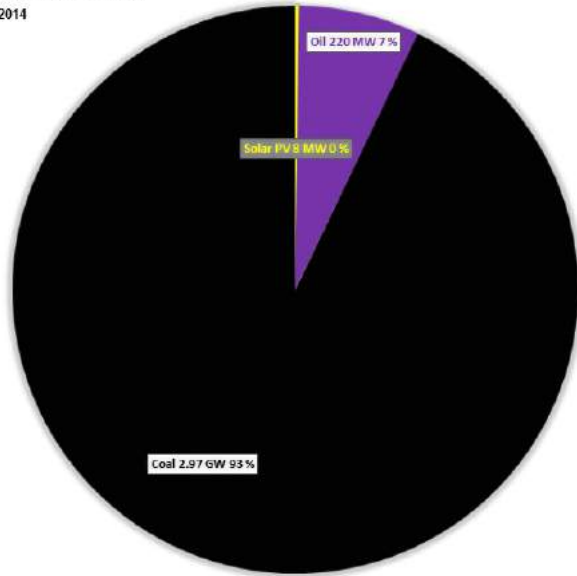
Key insights:

- Historically, a significant share of fossil power plants in the generation mix is observed
- Recent growth in RE installed capacity is observed
- However, fossil power plants capacity increased more than RE capacity from 2010 to 2014

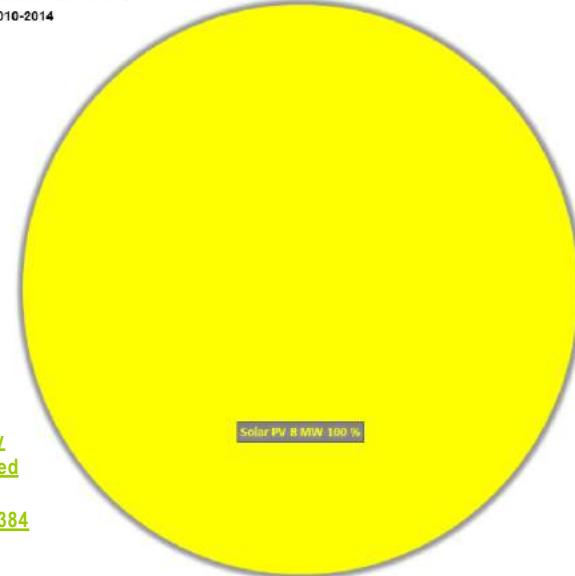


DPR of Korea - Power Plant Infrastructure

KOREA DEMOCRATIC PEOPLE'S REPUBLIC
Total Capacity by end of 2014
3.20 GW
Sustainability Indicator
-94 %



KOREA DEMOCRATIC PEOPLE'S REPUBLIC
Total Capacity added in 2010-2014
8 MW
Sustainability Indicator
100 %



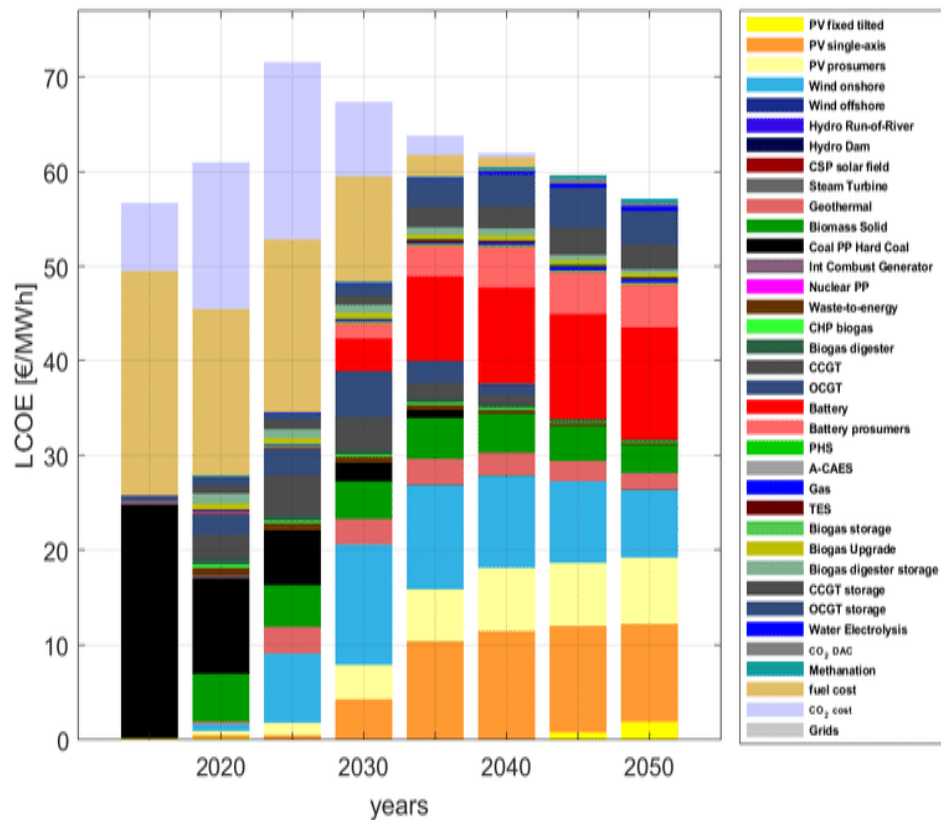
source:

[Farfan J. and Breyer Ch., 2017. Structural changes of global power generation capacity towards sustainability and the risk of stranded investments supported by a sustainability indicator: J of Cleaner Production, 141, 370-384](#)

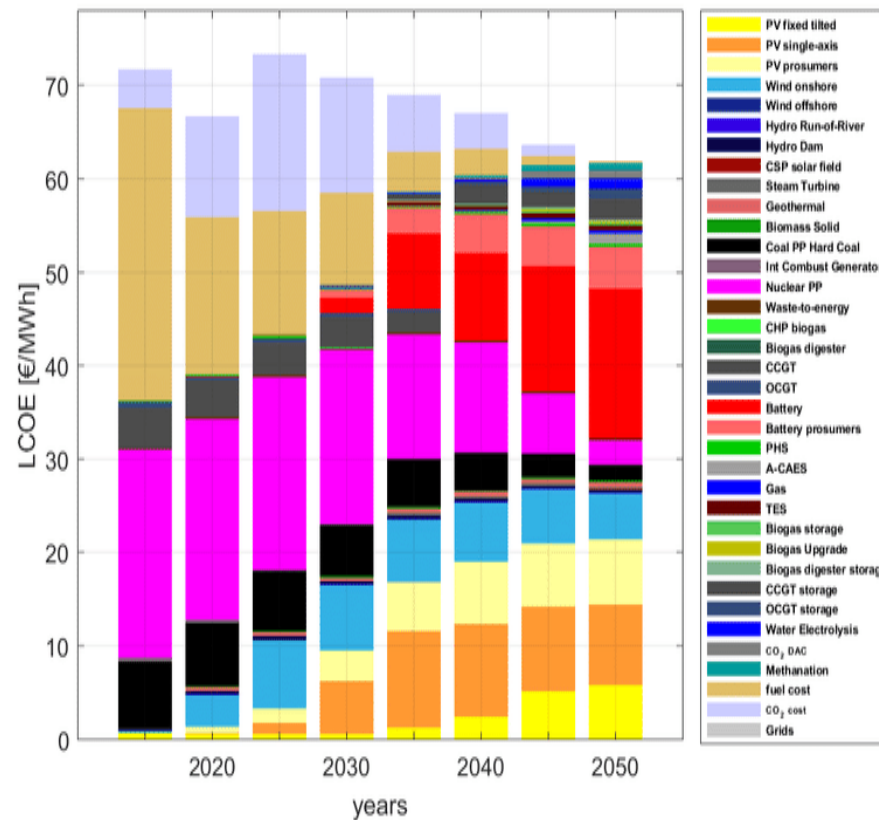
Key insights:

Historically, a significant share of coal power plants in the generation mix is observed
Solar PV is growing, but slowly

LCOE for electricity with 100% Renewables in South and North Korea

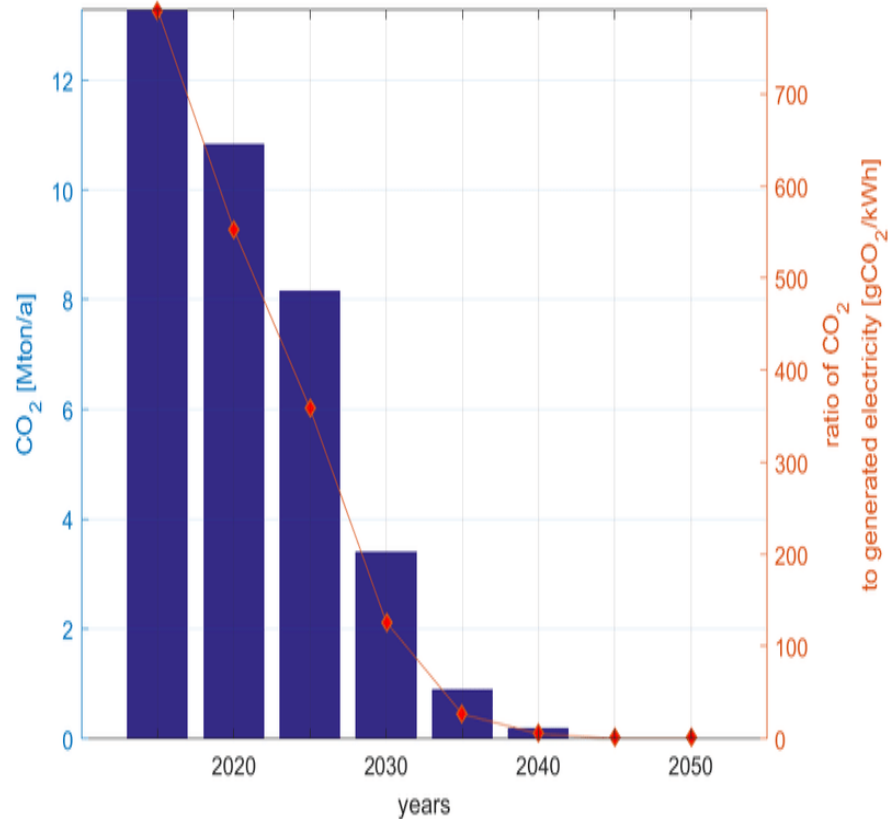


North Korea

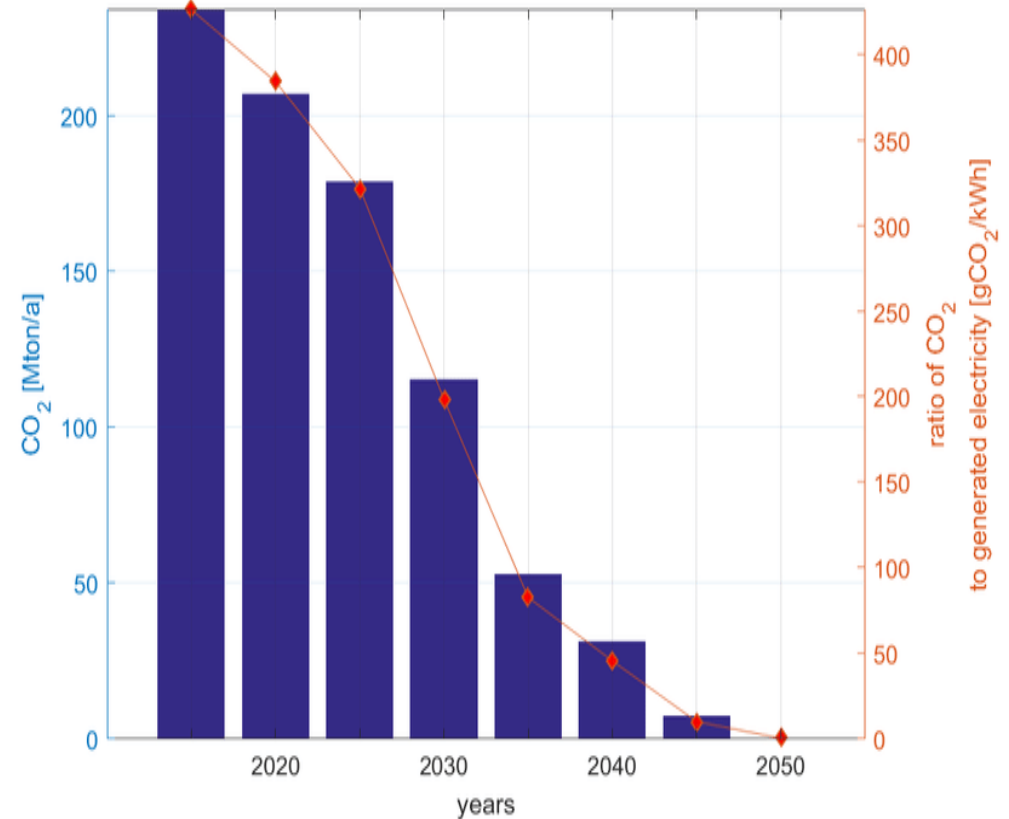


South Korea

CO2 emissions in the power sector will decrease to zero by 2050



North Korea

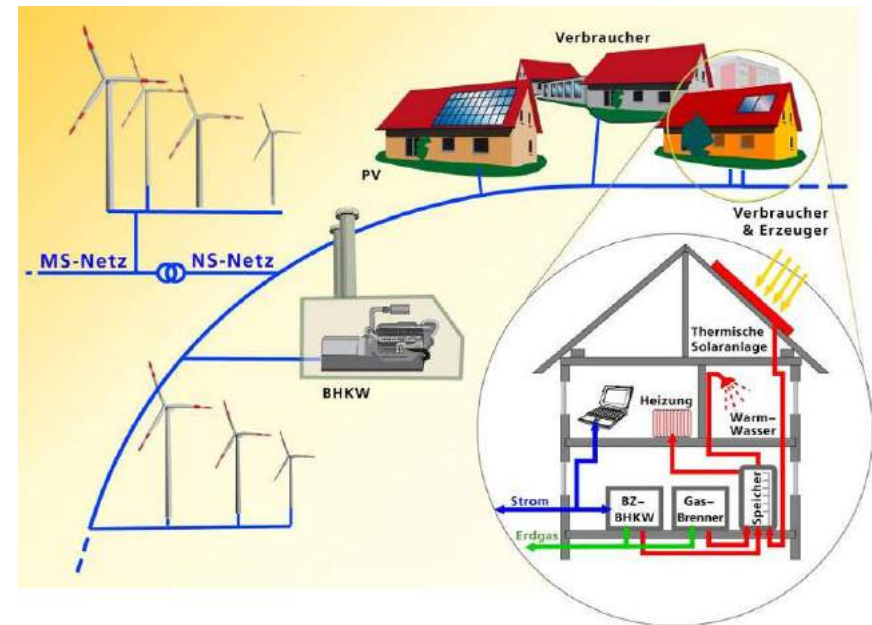


South Korea

Overall concepts for 100% renewables

- Renewable energy (wind, solar, hydro, waves, bioenergy, geothermal power) for: heating, cooling, mobility, electricity, industry
- Storage: hydro pump; batteries; power to gas; ice (heat) storage
- Big data; smart homes; smart cities

Hybrid/
electric
vehicles



Policy recommendations

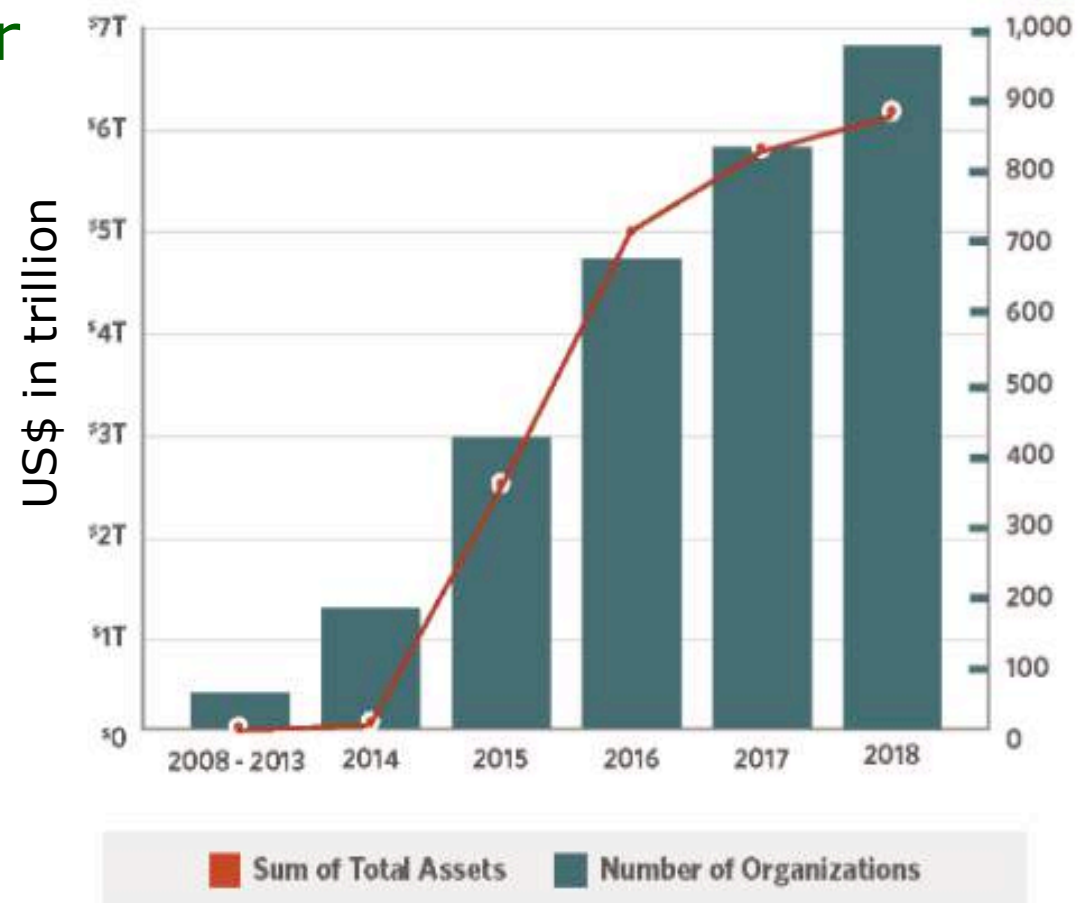
- Instruments, enabling direct private investments in renewable energy and other zero-emission technologies.
 - The German Renewable Energy Sources Act (EEG) with a fixed feed-in-tariff
 - Hybrid renewable power plant remuneration
 - Tenders only for capacities above 40MW
- Phasing-out all state subsidies to fossil fuel and nuclear energy generation
- Tax exemptions for investments in renewable energy
- Replacement of emission trading system with carbon & radioactivity taxes
- Research and education

Global fossil fuel divestment movement

As of September 2018,
\$6.24 trillion fossil fuel assets flagged for divestment

- 985 institutions
- >5,800 individuals
- Major actors: religious organizations, municipalities, universities, large pension funds & insurance companies

Growth in Divestment Commitments



Leonardo di Caprio 17.4.2017 in Shanghai at presentation of new BYD e-cars: Global Cooling by 1° C



International campaign for 100% renewables

PEOPLE'S CLIMATE MOBILISATION

Climate change, loss of biodiversity, resource scarcity and poverty urge us to take action TODAY!

Join the global 100% RE movement and show that another world is POSSIBLE!

Hans-Josef Fell, Ambassador Global 100% RE

More prominent figures and celebrities are invited to join our international campaign for 100% renewables!



@Global100RE



/Global100RE



Promotion of benevolence, harmony and peace, transcending all boundaries of nations – as advocated by Dr. Lui Che Woo – “energizing the people”

Ruslana

- Winner of Eurovision Song Contest 2004 for Ukraine
- Lady Maidan 2013, Kyiv
- Former Member of Ukrainian Parliament



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***Thank you very
much for your
attention!***

www.hans-josef-fell.de

www.energywatchgroup.org