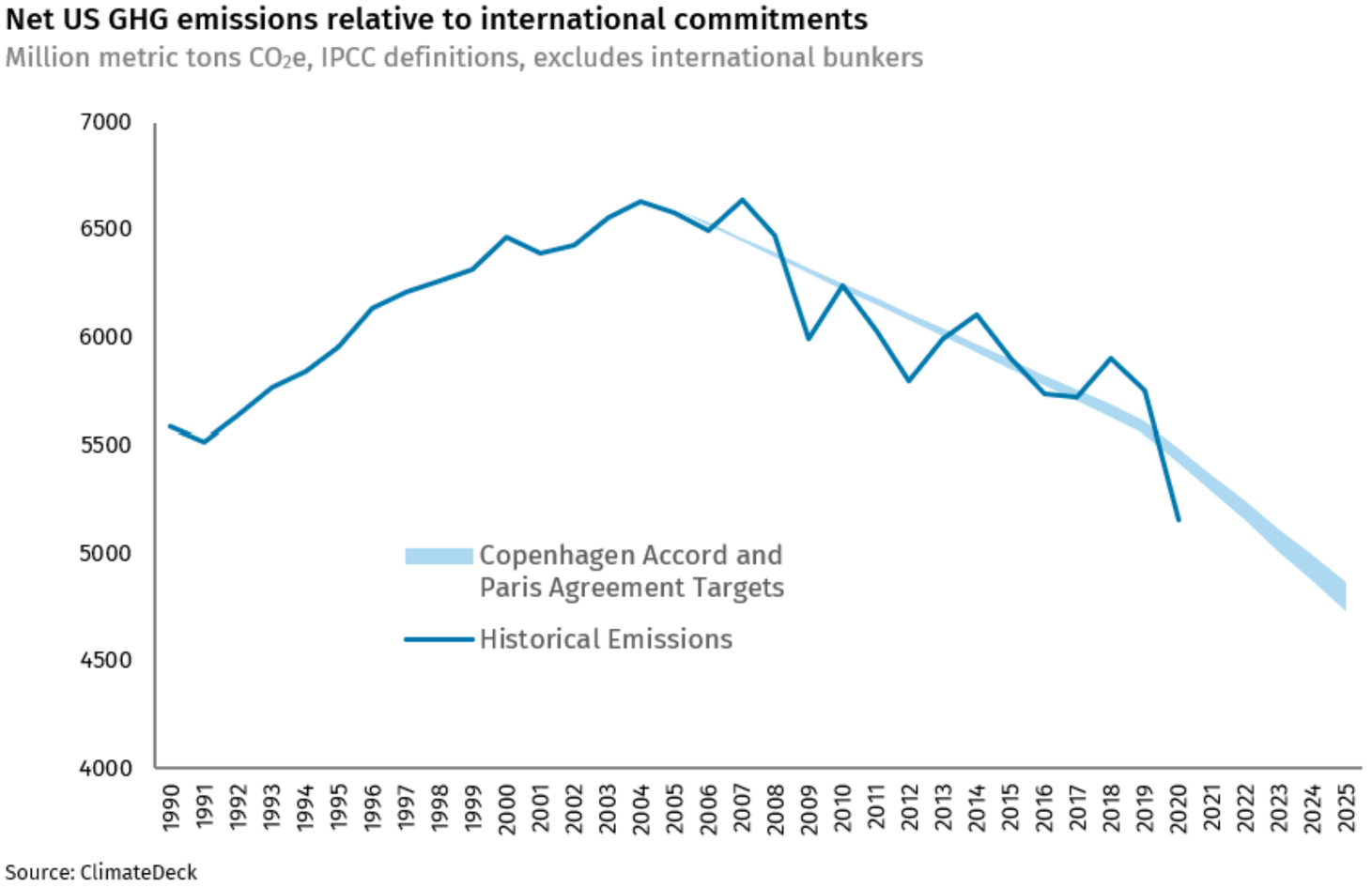
U.S. Is World Climate Leader

"The U.S. saw the largest decline in energy-related CO_2 emissions in 2019 on a country basis… US emissions are now down almost 1 Gt from their peak in the year 2000, the largest absolute decline by any country over that period." – International Energy Agency, 2020



ENVIRONMENTAL PROGRESS

Source: Rhodium Group, Jan 12, 2021

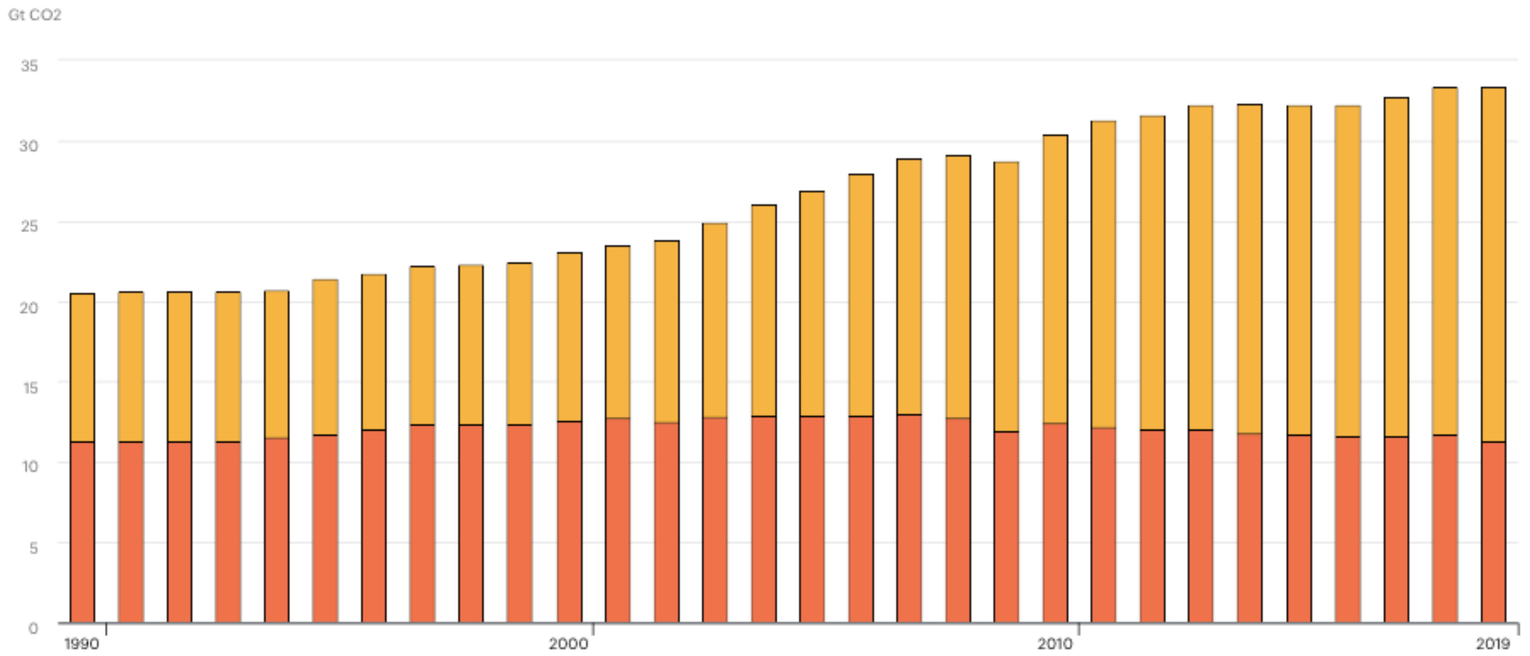
World at or near peak emissions

Energy related CO2 emissions, 1990-2019

Last updated 11 Feb 2020

Download chart ↓

International Energy Agency



Advanced economies Rest of the World

ENVIRONMENTAL PROGRESS

RESOURCE LIBRARY I ARTICLE

A Whopping 91 Percent of Plastic Isn't Recycled

Billions of tons of plastic have been made of the past decades, and much of it is becoming trash and litter, finds the first analysist of the issue.

GRADES

5 - 12+

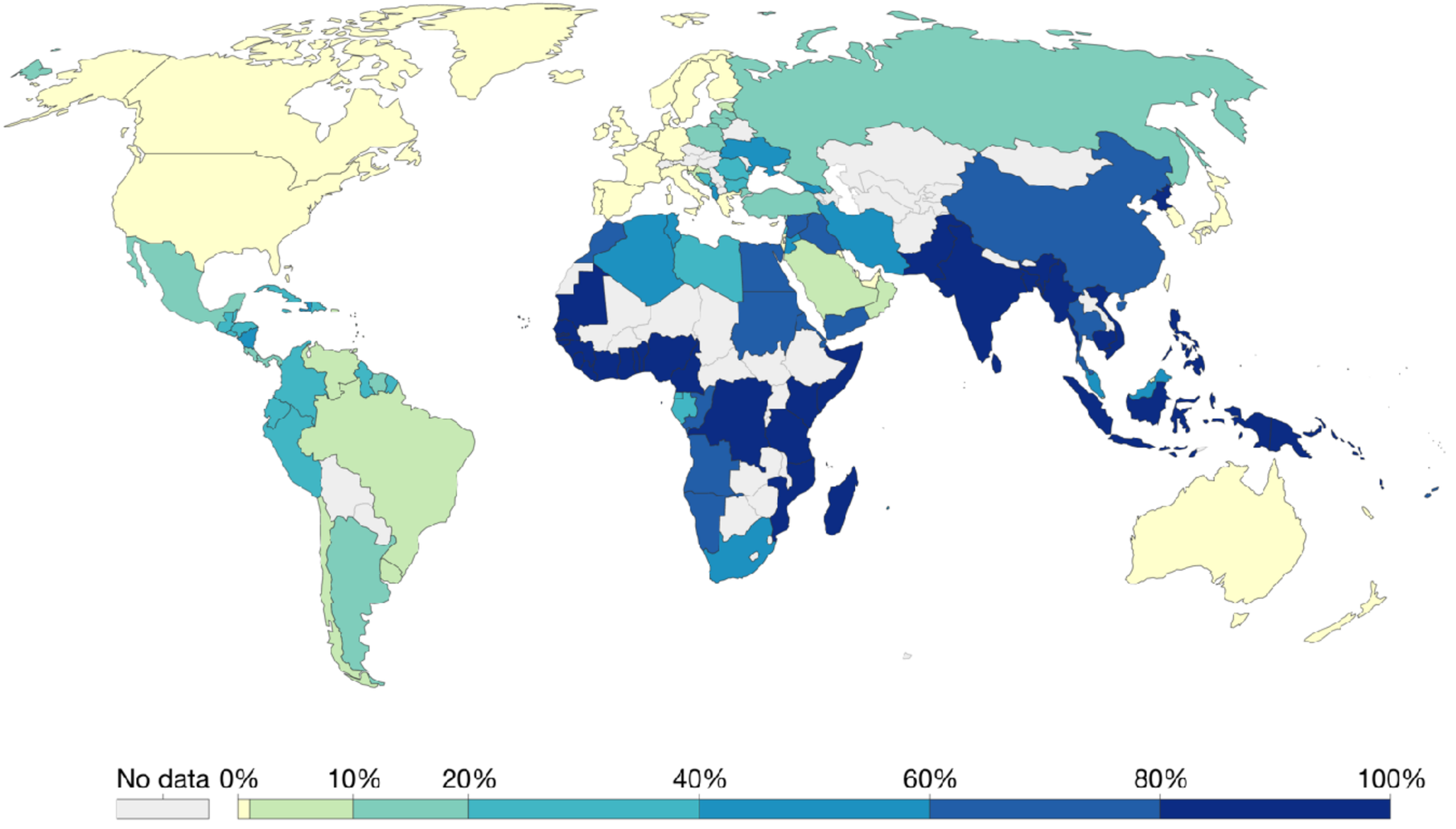
SUBJECTS

Biology, Chemistry, Conservation, Earth Science, Oceanography

Share of plastic waste that is inadequately managed, 2010

Share of total plastic waste that is inadequately managed. Inadequately disposed waste is not formally managed and includes disposal in dumps or open, uncontrolled landfills, where it is not fully contained. Inadequately managed waste has high risk of polluting rivers and oceans. This does not include 'littered' plastic waste, which is approximately 2% of total waste (including high-income countries).

Our World in Data



ENVIRONMENTAL PROGRESS

Source: OurWorldinData.org; based on Jambeck et al. (2015)

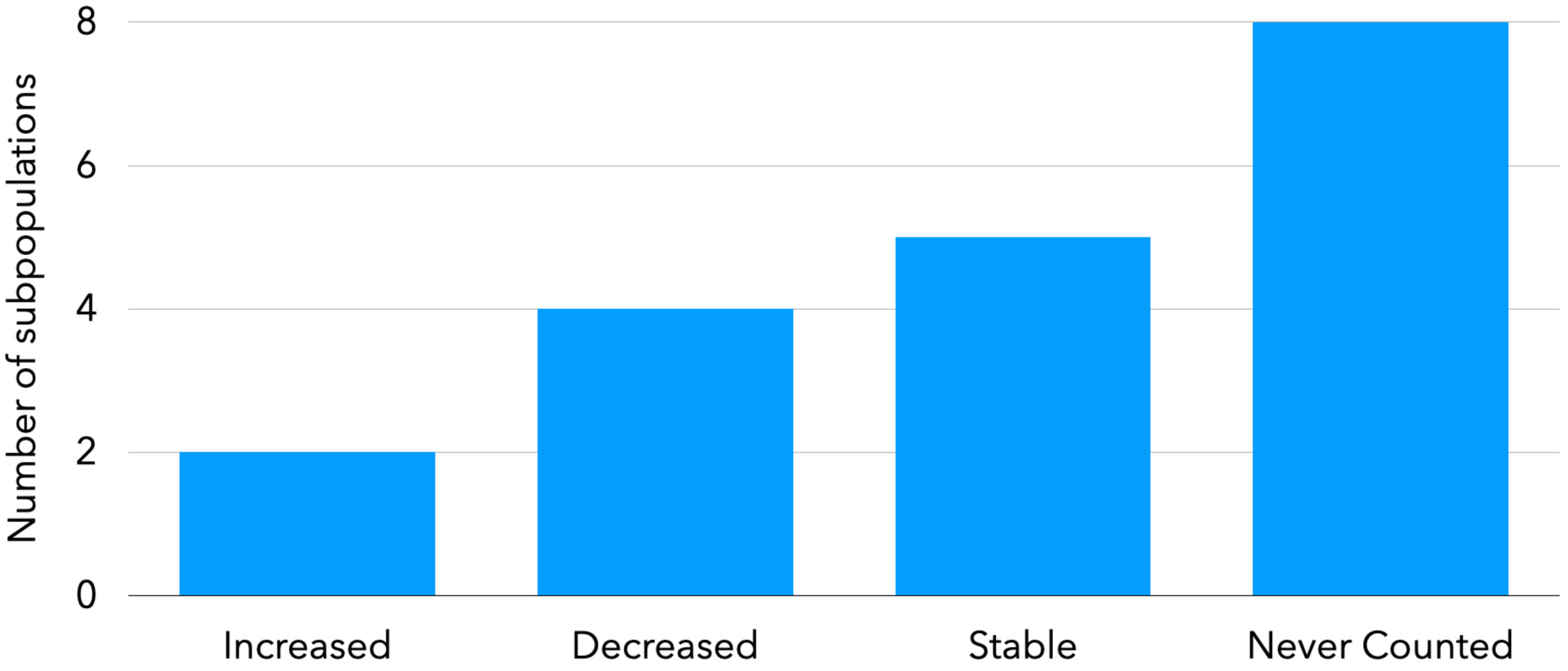
Plastics helped save the Hawksbill turtles..

Nearly nine million hawksbills were hunted for their shells during the 148-year period from 1844 to1992.

ENVIRONMENTAL PROGRESS

Source: Tina Deines, "Endangered hawksbill turtle shell trade is much bigger than scientists ever suspected" *National Geographic,* March 27, 2019

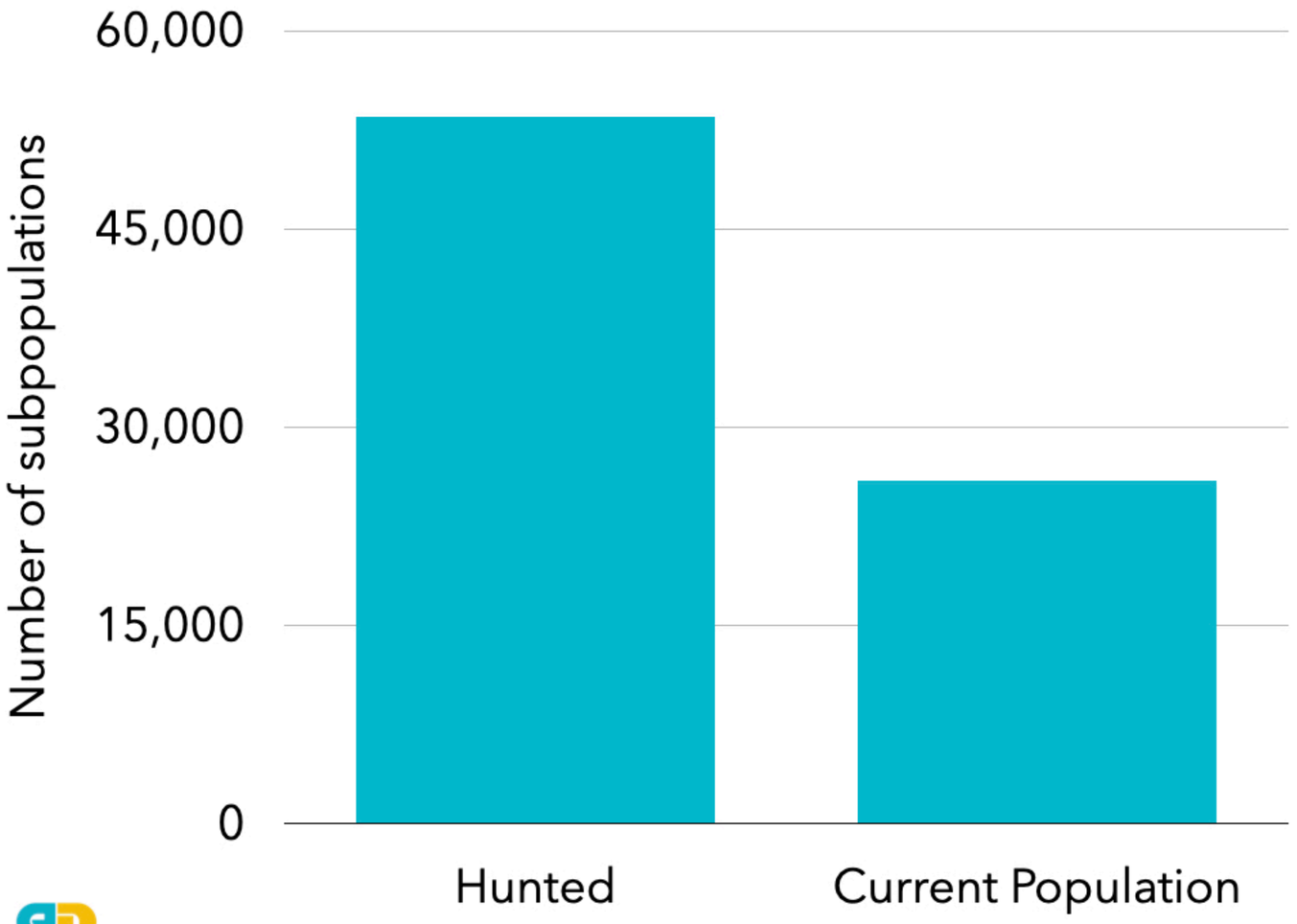
There is no discernible overall trend to suggest polar bear famine



ENVIRONMENTAL PROGRESS

Source: Polar Bear Study Group, "Summary of Polar Bear Population Status per 2019," 2019

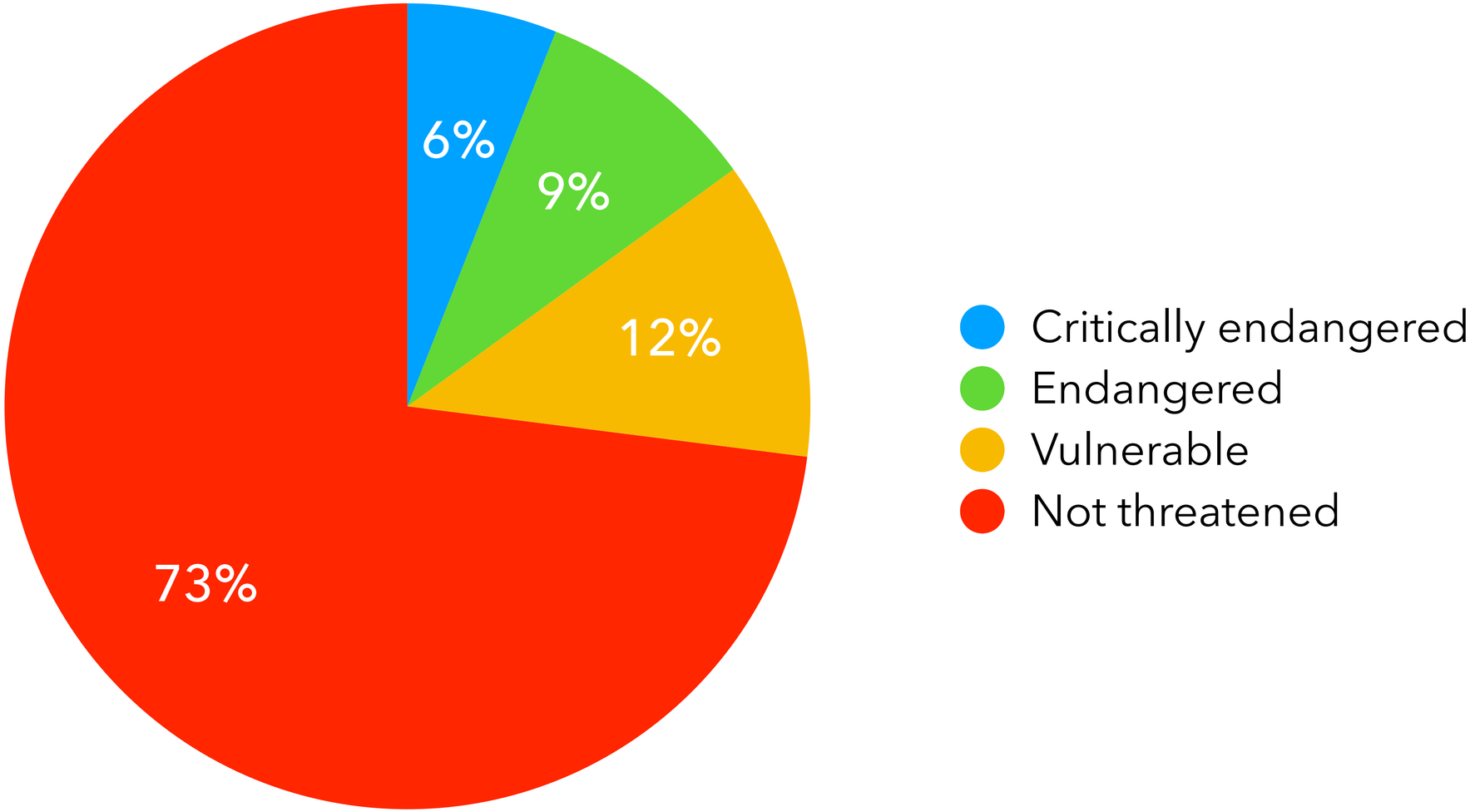
Between 1963 and 2016, twice as many polar bears were killed by hunters as exist in the wild today



ENVIRONMENTAL PROGRESS

Source: Rachel Fobar, "Should Polar Bear Hunting Be Legal? It's Complicated," *National Geographic*, May 28, 2019

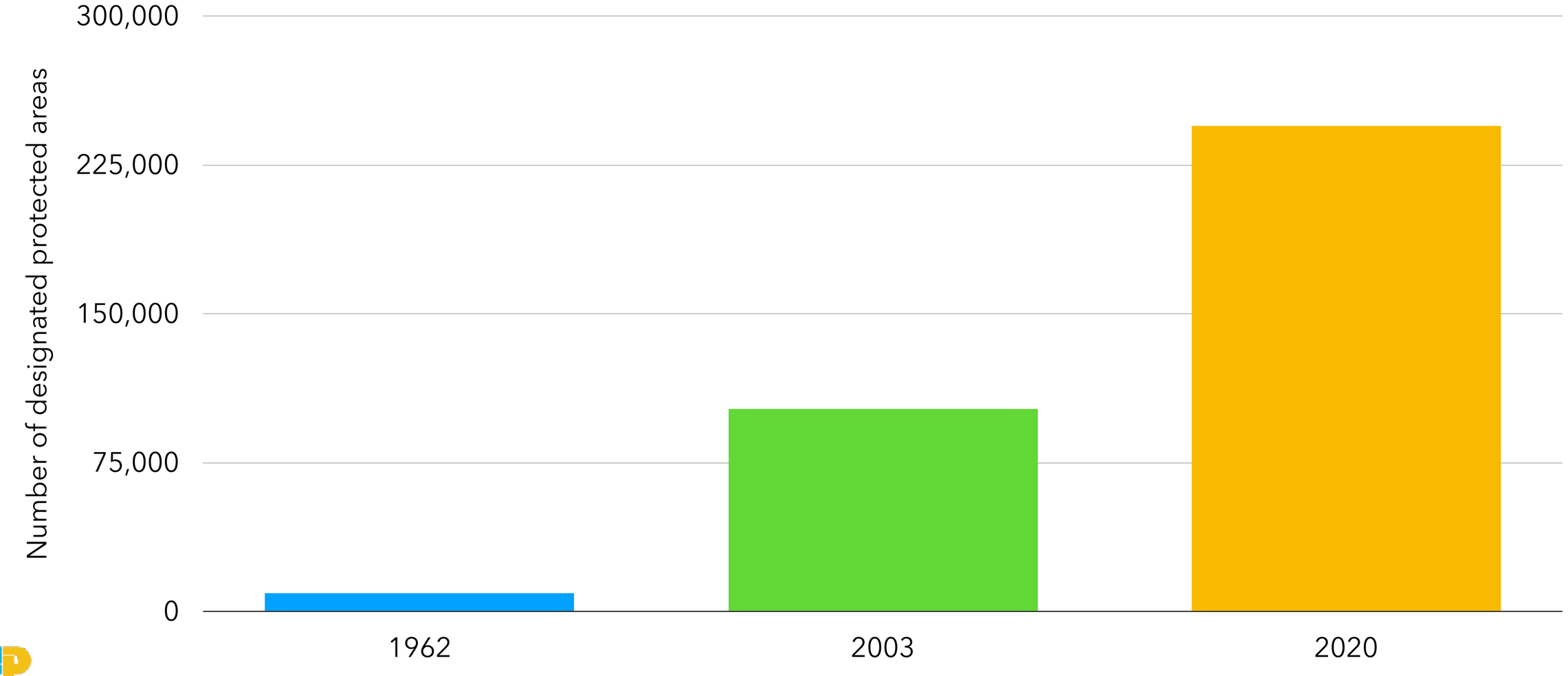
The International Union for the Conservation of Nature (IUCN) estimates that nearly **three-fourths** of all species are not threatened



ENVIRONMENTAL PROGRESS

Source: IUCN Red List of Endangered Species, https://www.iucnredlist.org

There are more than **25x** the number of designated protected areas in the world today than in 1962



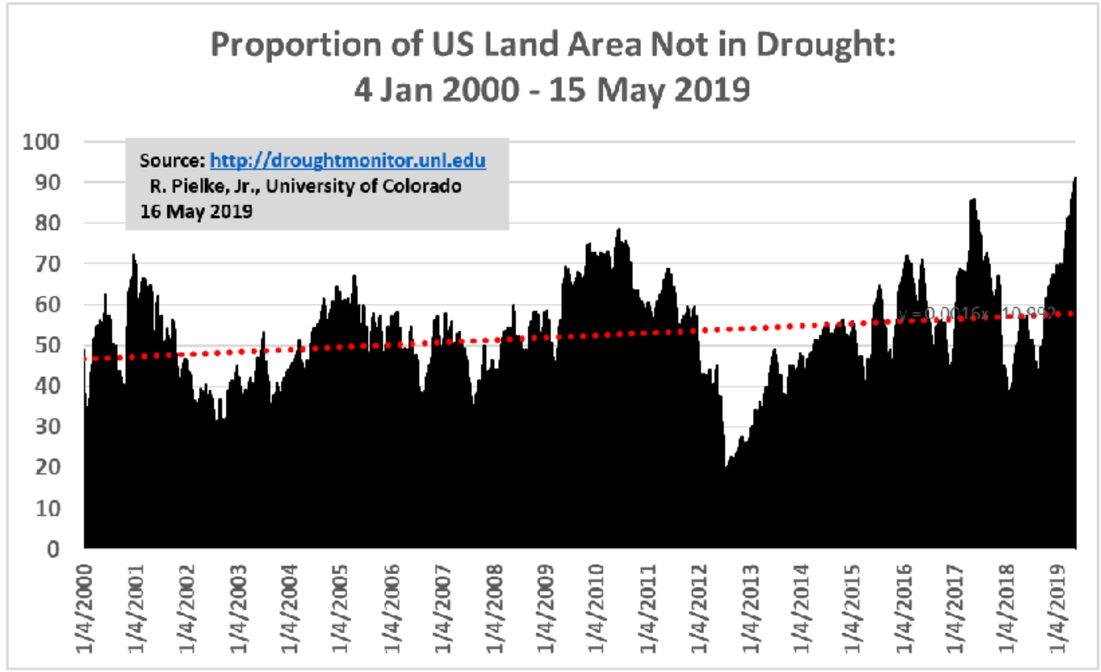
Source: Marine Deguignet, Diego Juffe-Bignoli, Jerry Harrison et al., *2014 United Nations List of Protected Areas*, United Nations Environment Programme, 2014, www.unep-wcmc.org.

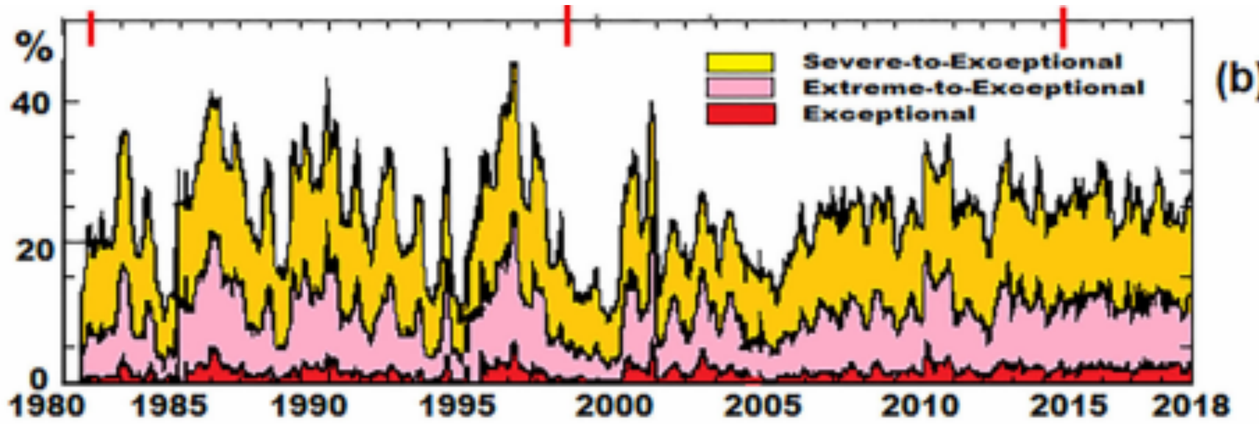
ENVIRONMENTAL PROGRESS

Droughts Not Increasing

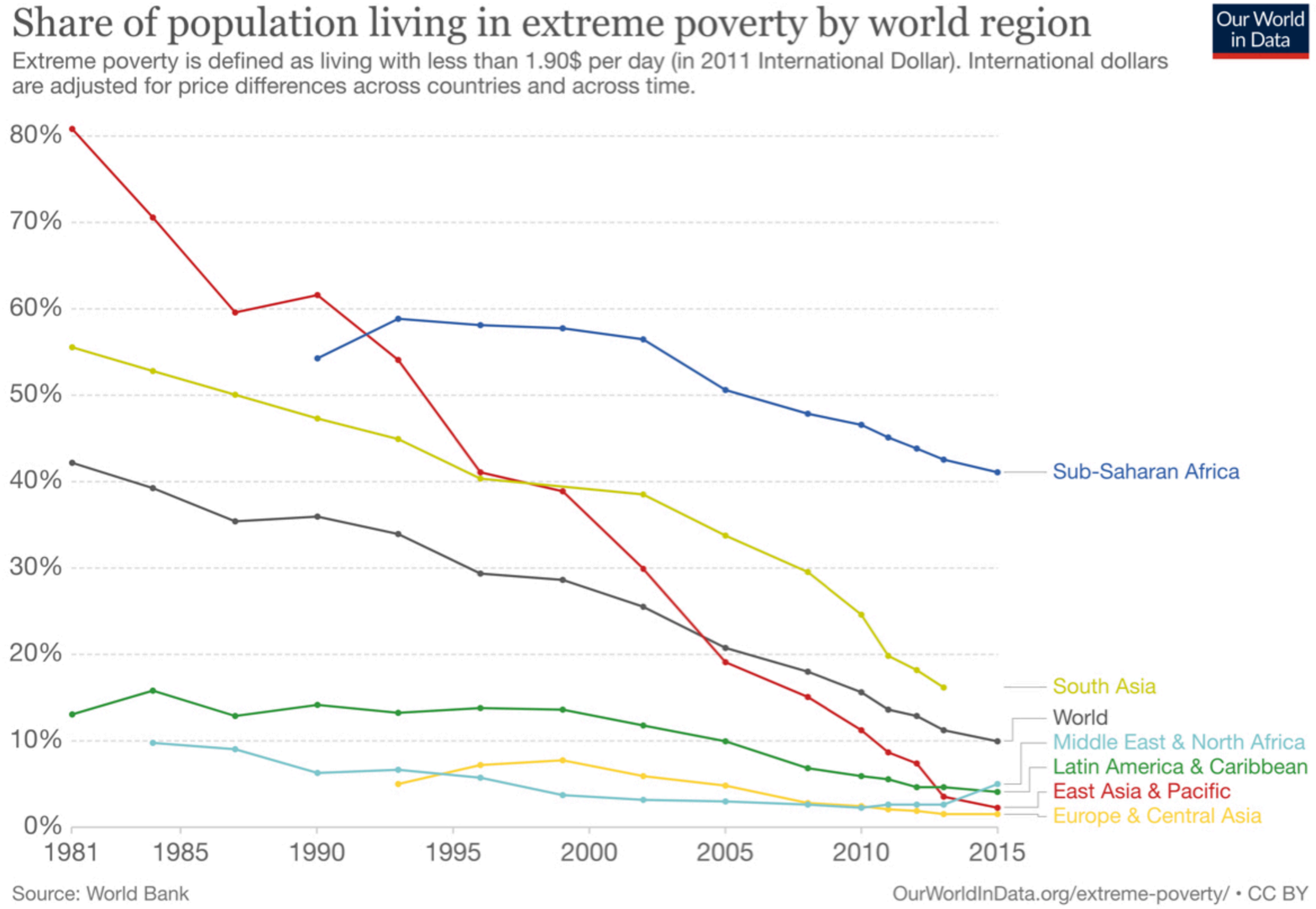
"Global and main grain countries' drought area and intensity trends have not been following global climate warming since 1980's"

Felix Kogan , Wei Guo & Wenze Yang (2020) Near 40-year drought trend during 1981-2019 earth warming and food security, Geomatics, Natural Hazards and Risk, 11:1, 469-490, DOI: 10.1080/19475705.2020.1730452





ENVIRONMENTAL PROGRESS



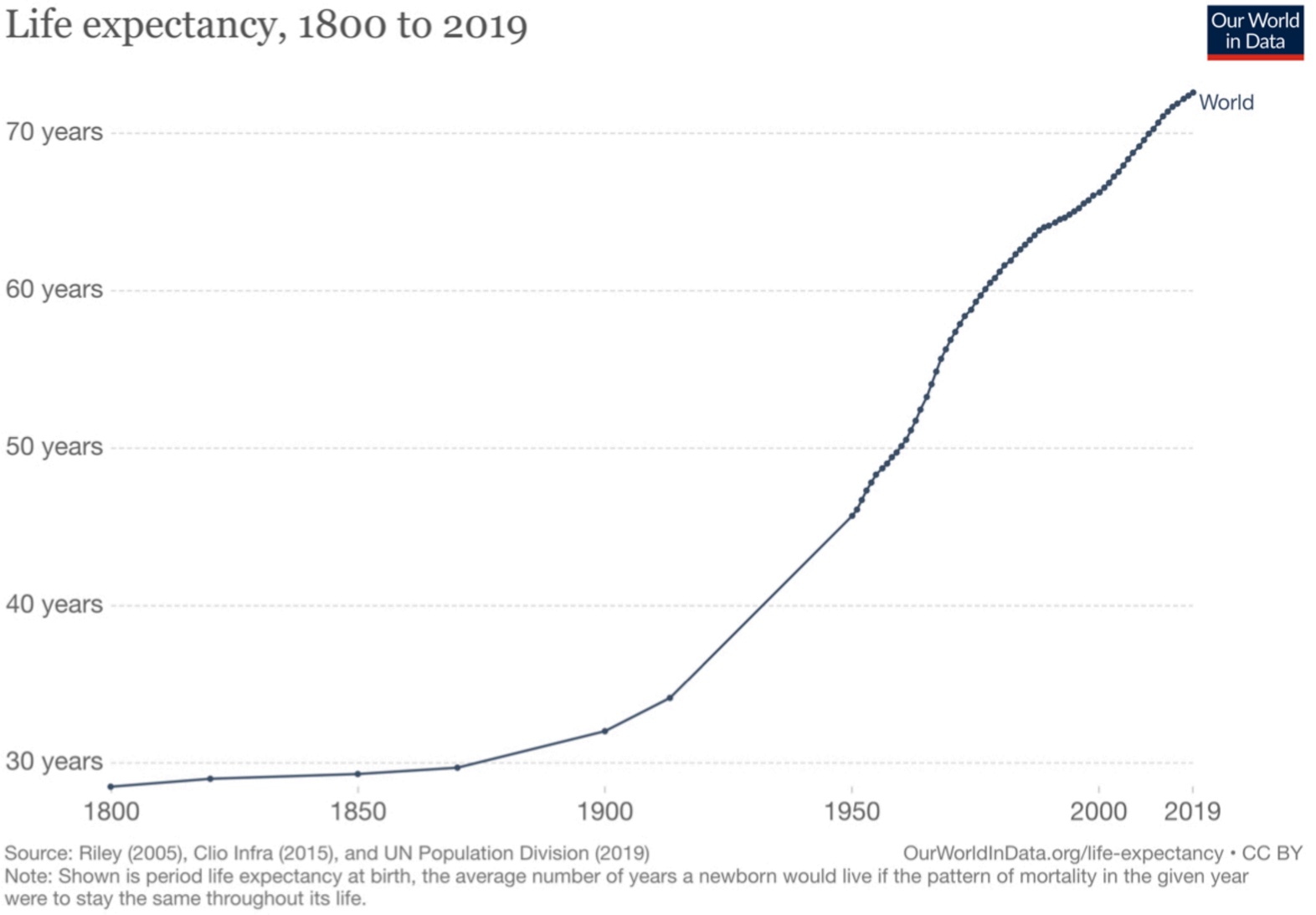
From 1981 to 2015, the global population living in extreme poverty fell from

44% to 10%

ENVIRONMENTAL PROGRESS

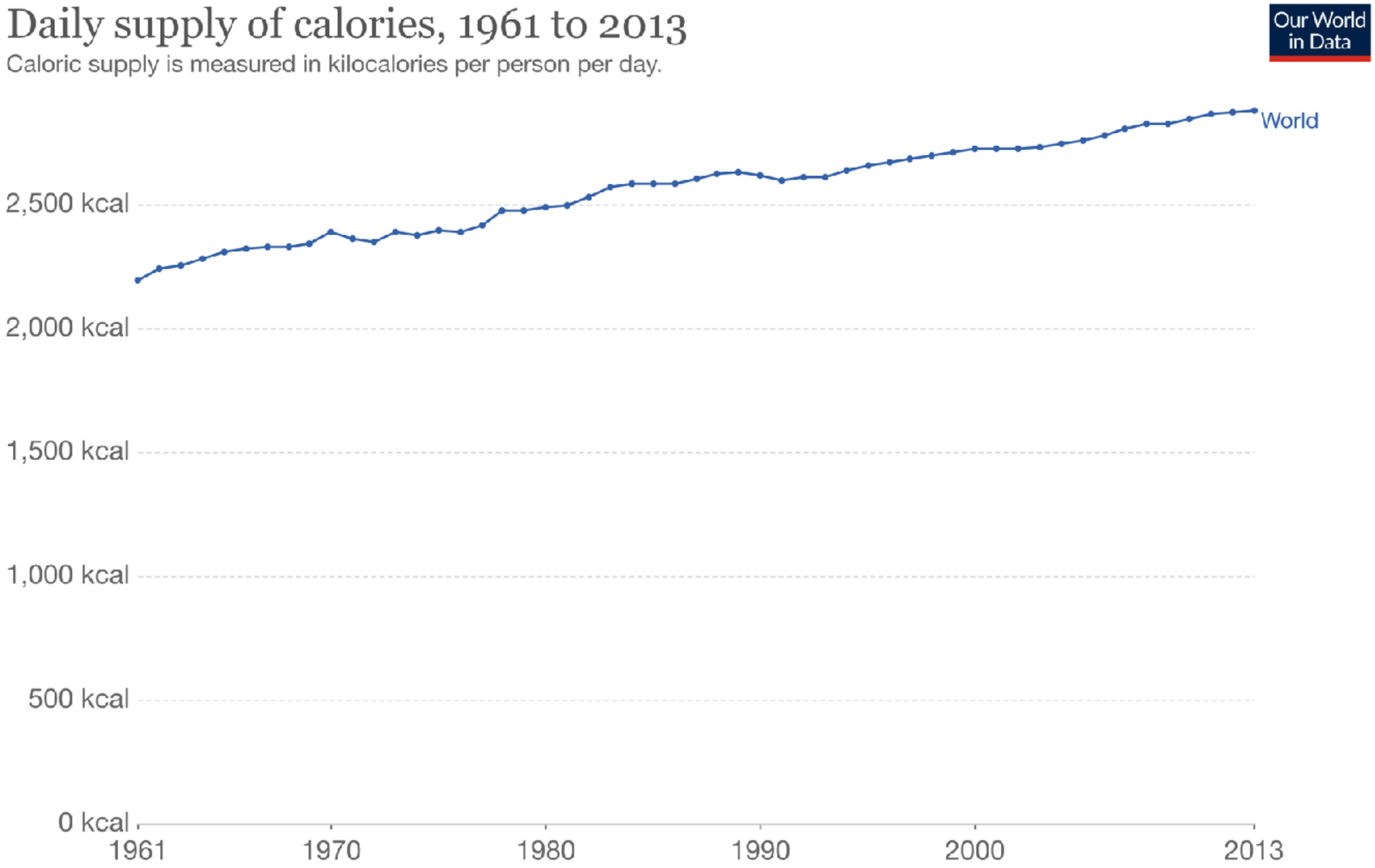
Source: Oxford University's Our World in Data

Urbanization, industrialization, and energy consumption have contributed to an extension of life expectancy of **over 40 years…**



ENVIRONMENTAL PROGRESS

Source: Nikos Alexandratos and Jelle Bruinsma, "World Agriculture Towards 2030/2050: The 2012 Revision," ESA Working Paper no. 12-03, Agricultural Develop- ment Economics Division, Food and Agriculture Organization of the United Nations, June 2012, http://www.fao.org/3/a-ap106e.pdf.

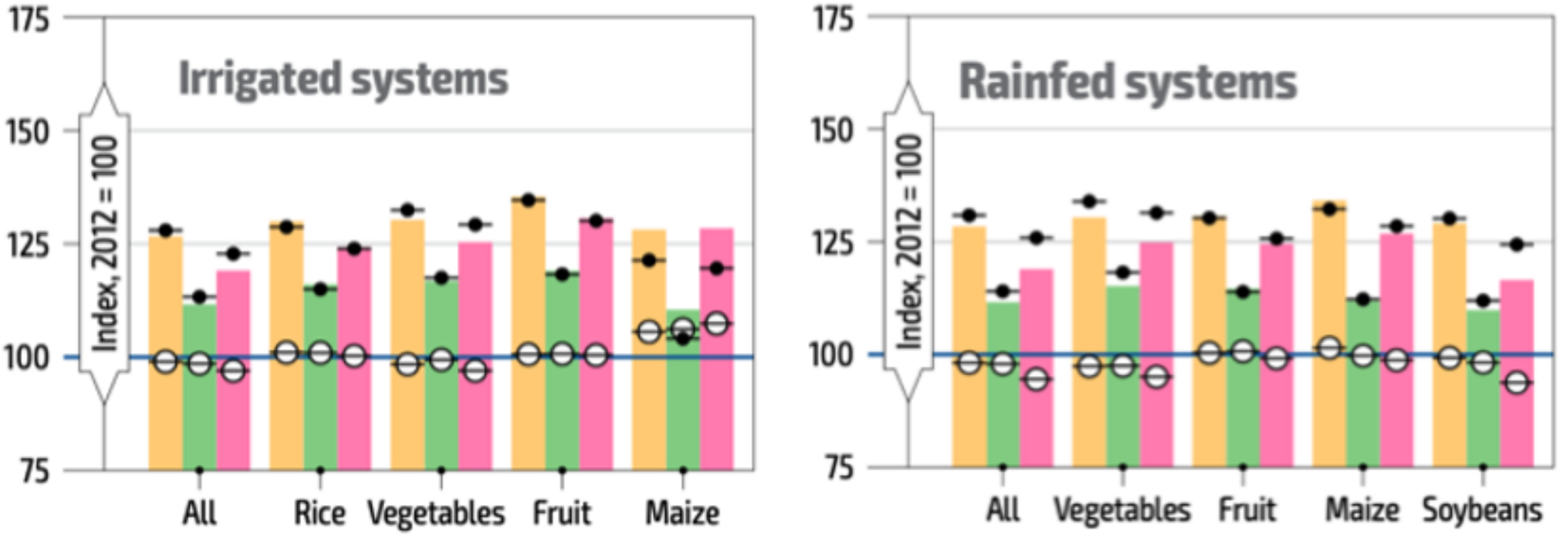


We already produce enough food for **10 billion** people, a **25% surplus**

ENVIRONMENTAL PROGRESS

Source: OurWorldInData.org/food-supply; UN Food and Agriculture Organization (FAO)

Tech Change Outweighs Climate Change in Food Production



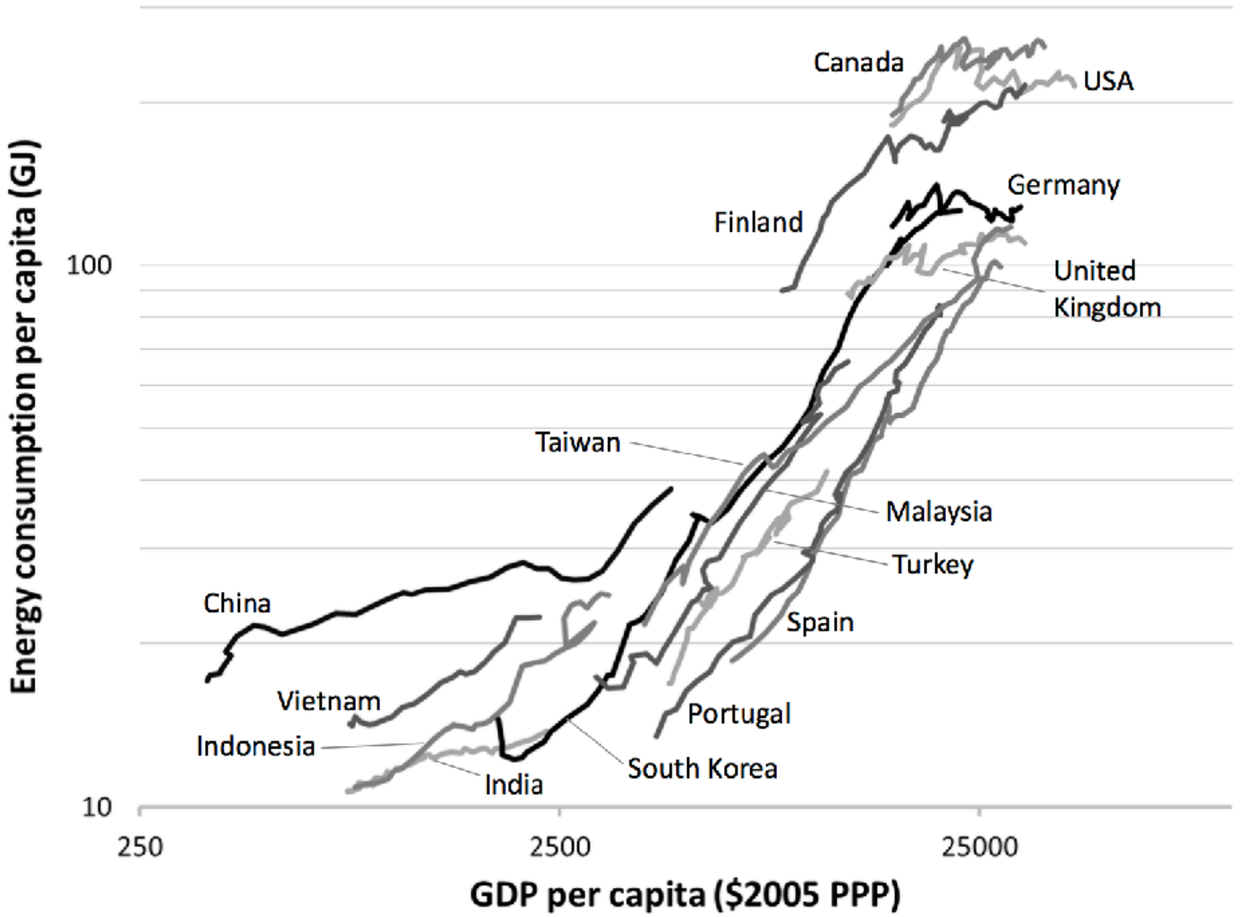
Note: Coloured bars indicate price-independent changes in yields attributed to both technical progress and climate change. The white circles indicate changes in yields arising from climate change, while the black barred dots indicate changes arising from technical progress. Climate change impacts are computed based on FAO-IIASA GAEZ v4 (scenario without CO2 fertilization, median value for five climate models). Changes in yields are shown for the four top commodities, as classified in the FAO GAPS model, in each region, and production system, ranked by value of production in 2012. In this figure, "Citrus" and "Other fruit" are aggregated into "Fruit". "All" refers to the aggregated change in production over the total harvested areas for all crops. Note that the results of research into the impacts of climate change on fruit trees are not conclusive (Ramírez and Kallarackal, 2015).

Sources: FAO Global Perspectives Studies, based on FAOSTAT (various years) for historical crop yields and value of production; FAO-IIASA GAEZ v4 for climate change shifters; and FAO expert judgement for technical shifters.

FAO. 2018. ***The future of food and agriculture - Alternative pathways to 2050***

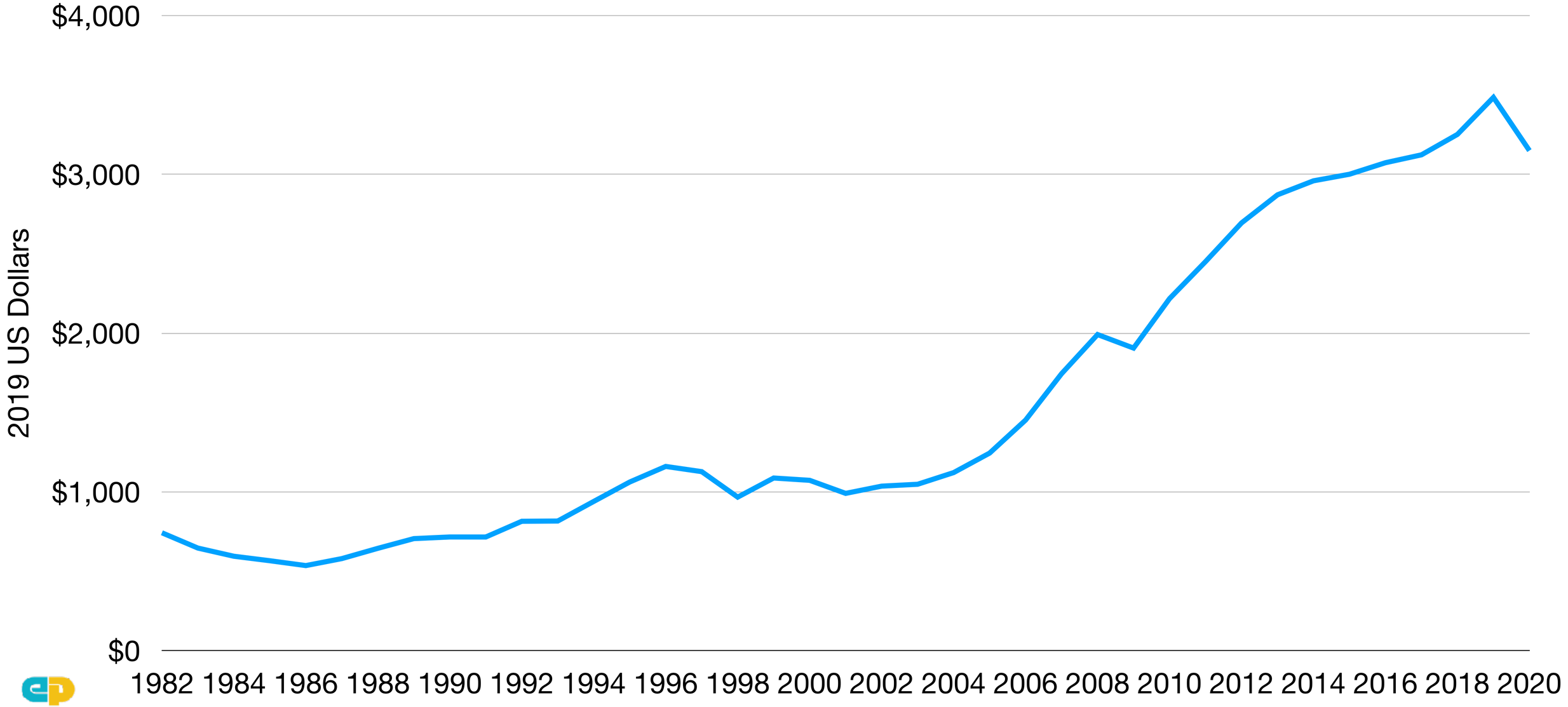
Energy consumption tightly tied to GDP

Figure 1: The *Energy Ladder*: Per Capita Final Energy Consumption and GDP at PPP, 1960 – 2006



Notes: Both axes have a logarithmic scale. Energy consumption data are obtained from the International Energy Agency's Extended Energy Balances, GDP per capita from the World Bank's World Development Indicators.

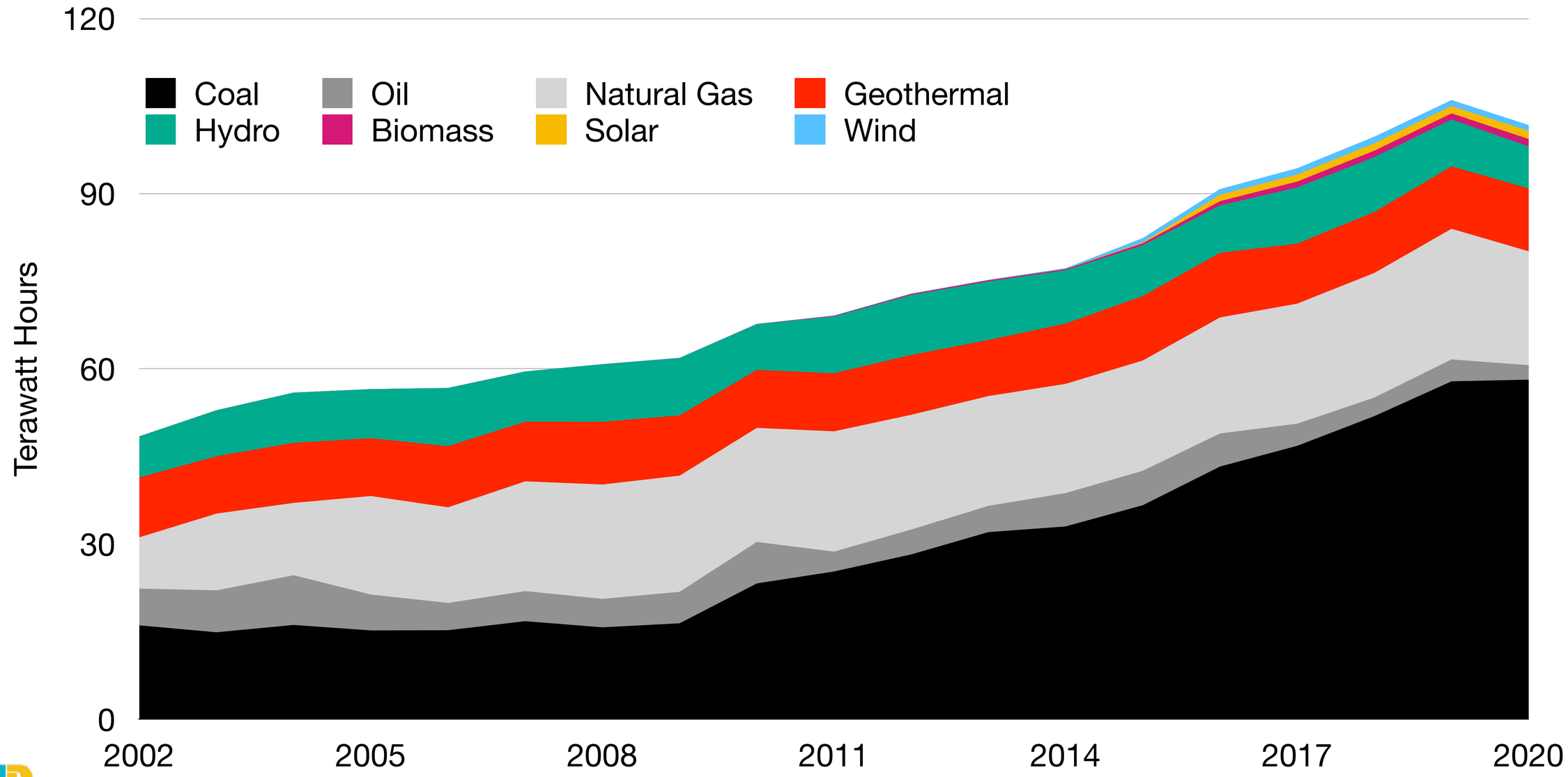
Phillipines GDP Per Capita



ENVIRONMENTAL PROGRESS

Source: World Bank

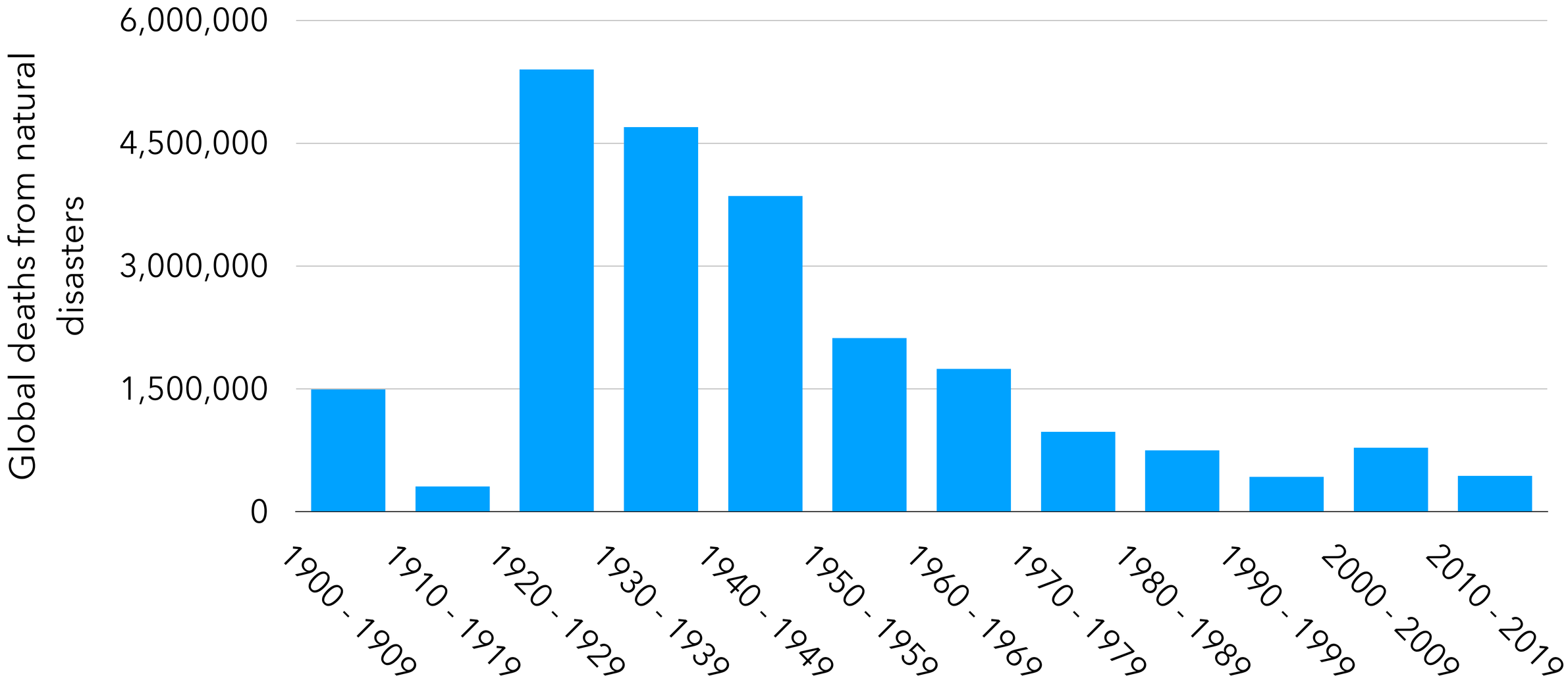
Philippines Electricity Generation by Fuel



ENVIRONMENTAL PROGRESS

Source: Philippines Department of Energy

Decadal Deaths from Natural Disasters

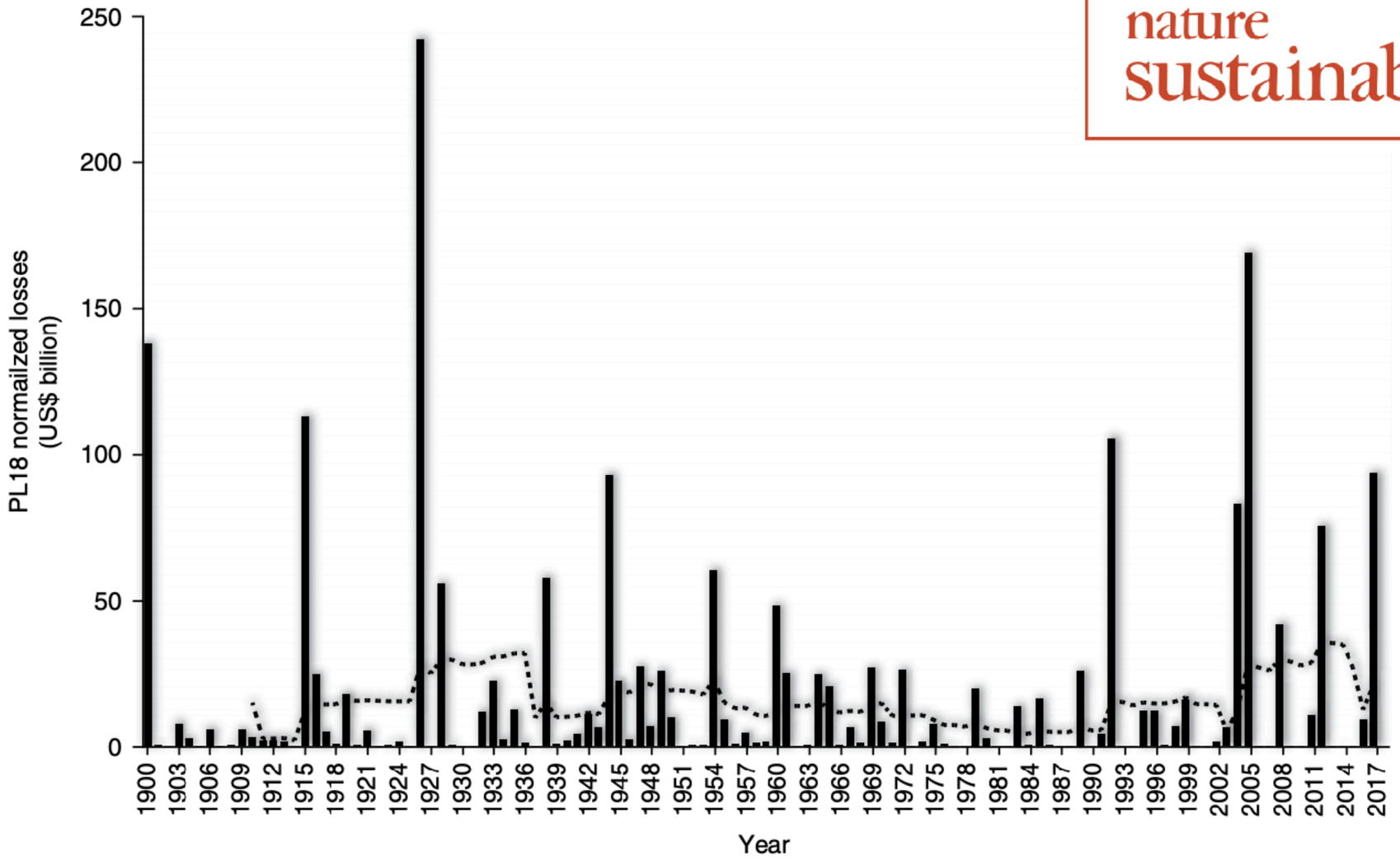


ENVIRONMENTAL PROGRESS

Source: Hannah Ritchie and Max Roser, "Global Deaths from Natural Disasters," Our World in Data, accessed October 25, 2019, https://ourworldindata.org /natural-disasters. Data published by EMDAT (2019): OFDA/CRED In- ternational Disaster Database, Université Catholique de Louvain–Brussels– Belgium. Data for individual years are summed over ten-year intervals from first to last year of each calendar decade.

Normalized hurricane damage in the continental United States, 1900–2017

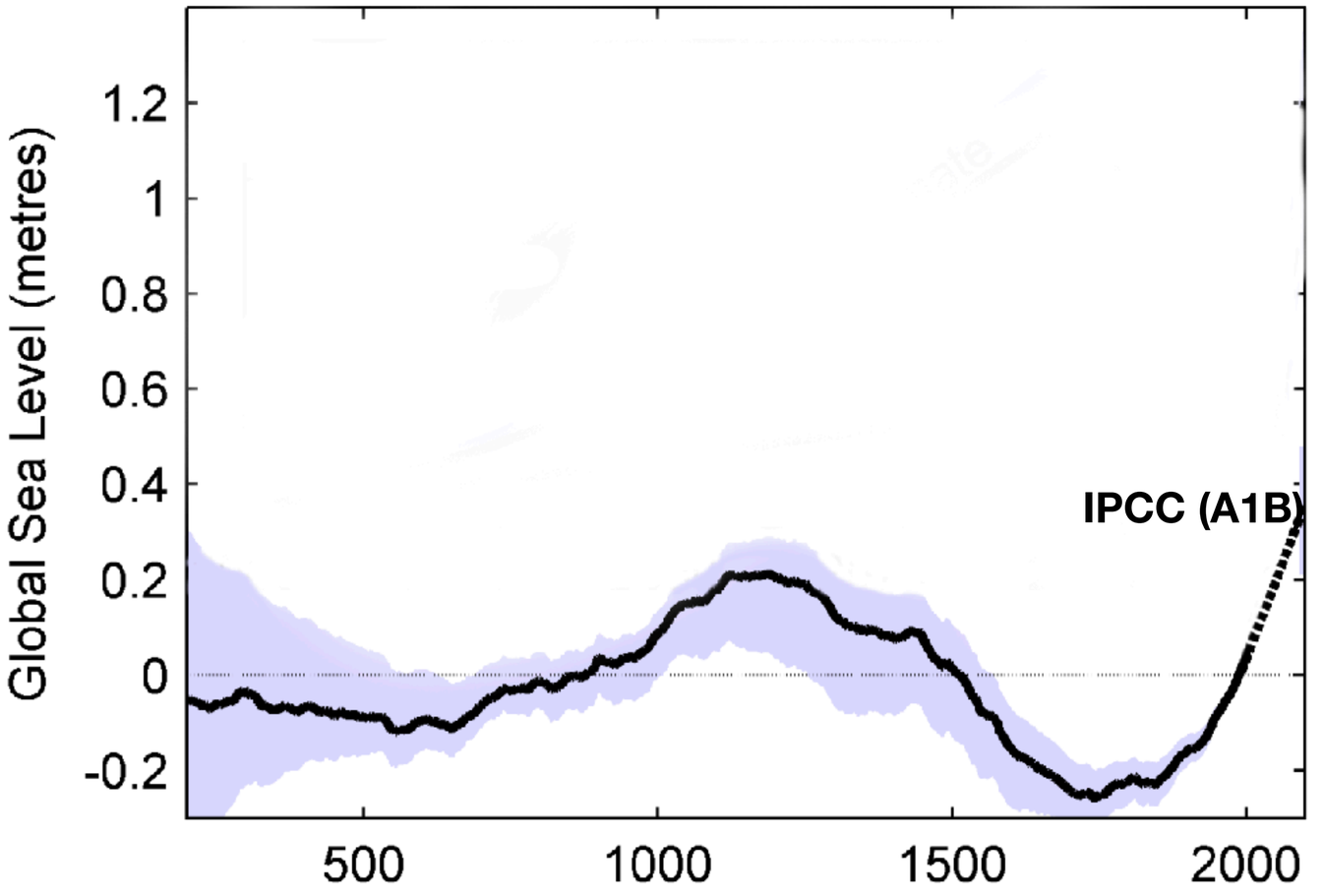
nature sustainability



ENVIRONMENTAL PROGRESS

Source: Jessica Weinkle, Chris Landsea, Douglas Collins, et al., "Normalized Hurricane Damage in the Continental United States 1900–2017," Nature Sustainability 1 (2018): 808–813, https://doi.org/10.1038/s41893-018-0165-2

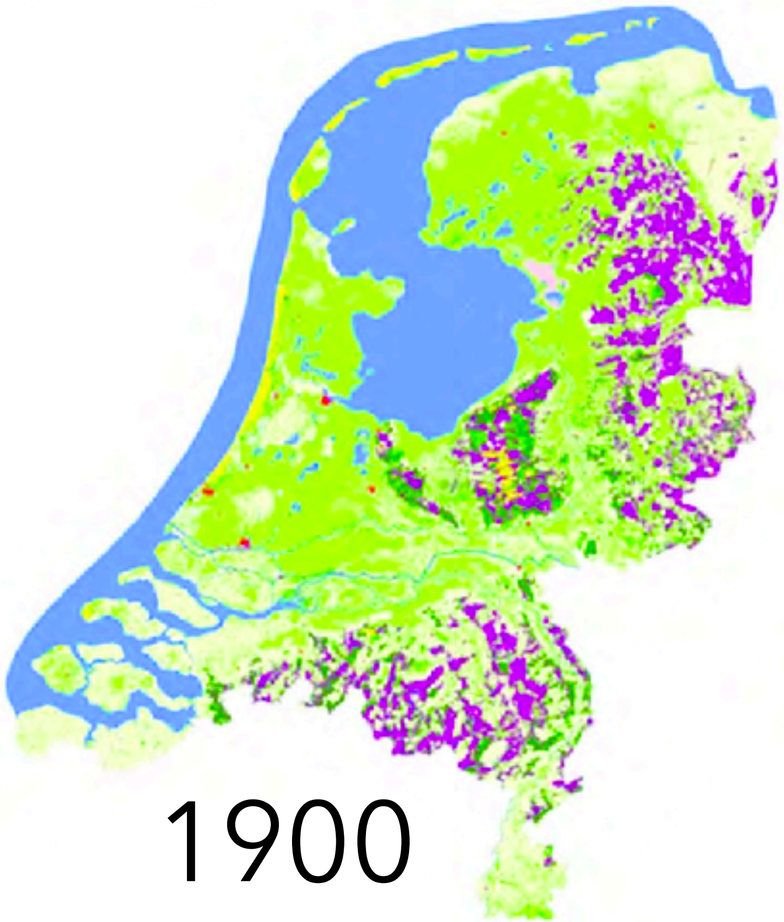
Even if IPCC's predictions prove to be significant under-estimates, the pace of sea level rise will allow time for adaptation



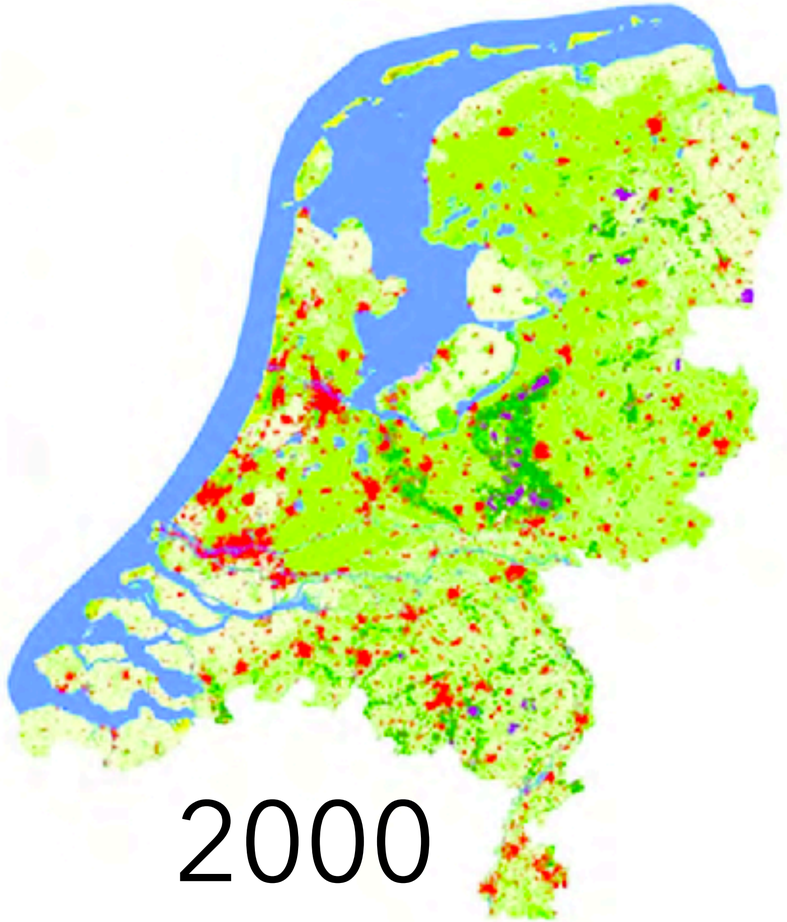
ENVIRONMENTAL PROGRESS

Source: Grinsted, A., J. C. Moore, and S. Jevrejeva (2009), Reconstructing sea level from paleo and projected temperatures 200 to 2100AD, Clim. Dyn., doi:10.1007/s00382-008-0507-2.

1/3 of the Netherlands lies below sea level, some areas as low as 7 meters



1900



2000

ENVIRONMENTAL PROGRESS

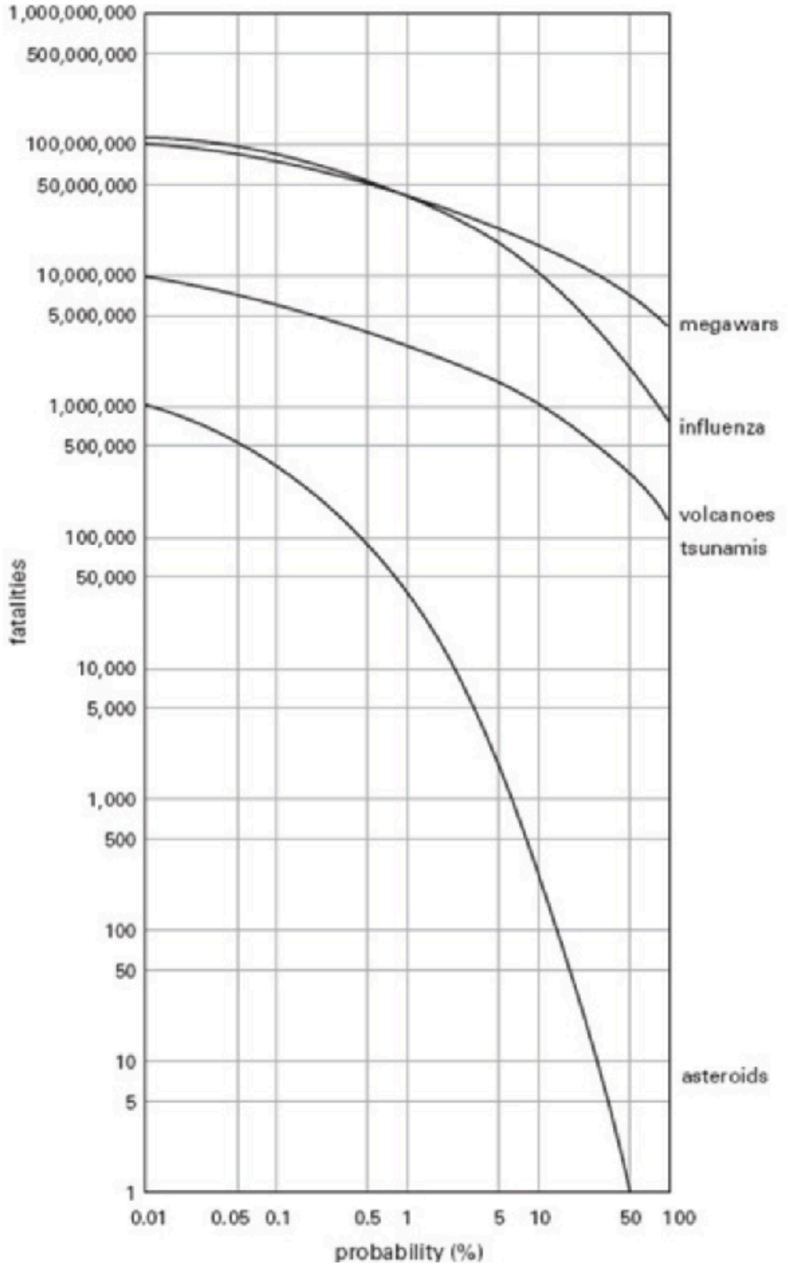
Source: "First National Report on Forest Genetic Resources for Food and Agriculture, Ministry of Economic Affairs, November 2012

"Climate dries the [wood] fuels out and extends the fire season from 4-6 months to nearly year-round but it's not the cause of the intensity of the fires. The cause of that is fire suppression and the existing debt of wood fuel."

– US Forest Service scientist Malcolm North, Forbes*, September 13, 2020*

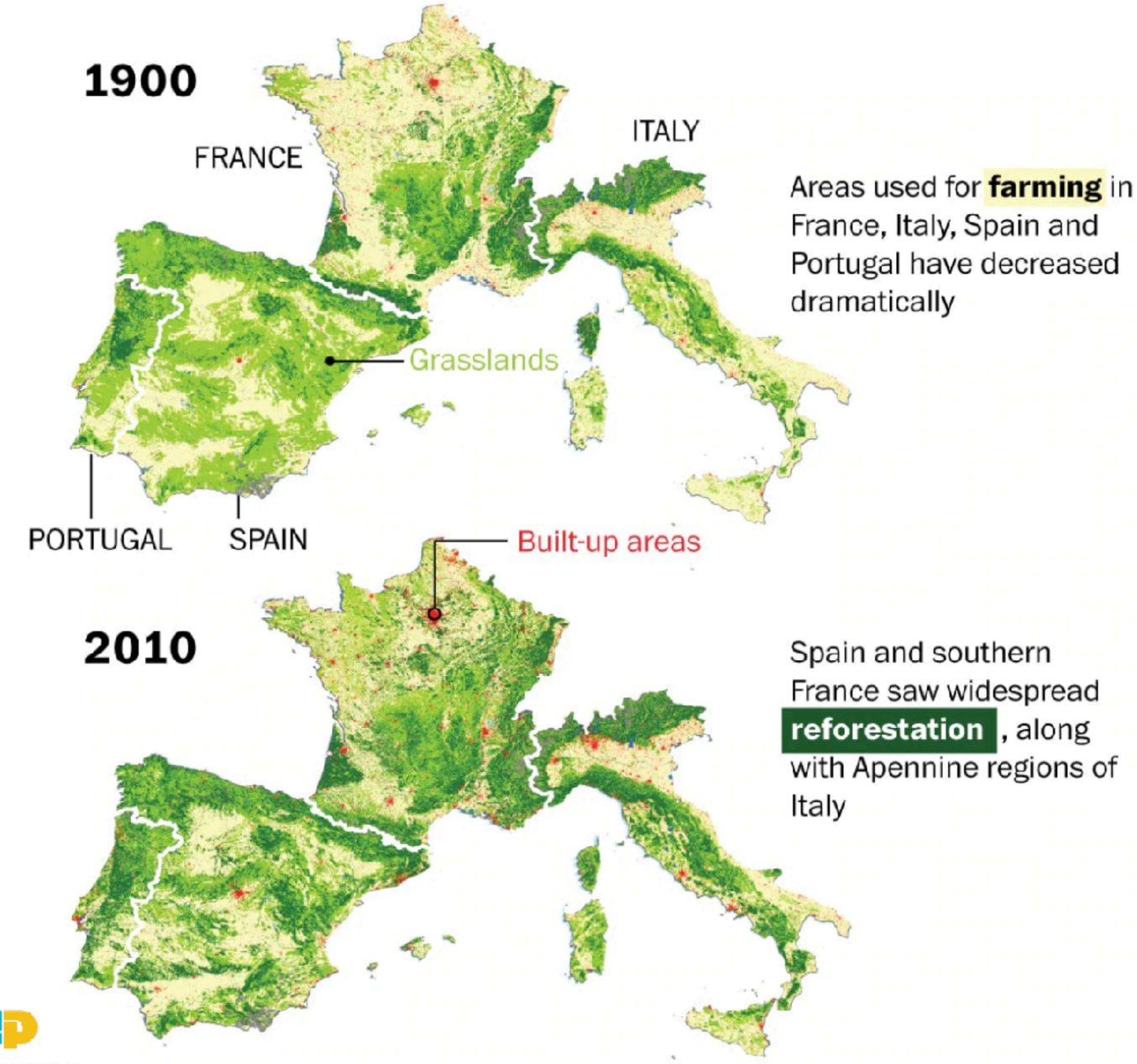
ENVIRONMENTAL PROGRESS

Wars, disease, volcanoes, tsunamis and asteroids, not climate change, pose the highest risk of catastrophe



Source: Vaclav Smil, "Global Catastrophes and Trends: The Next 50 Years," MIT Press (2008).

ENVIRONMENTAL PROGRESS

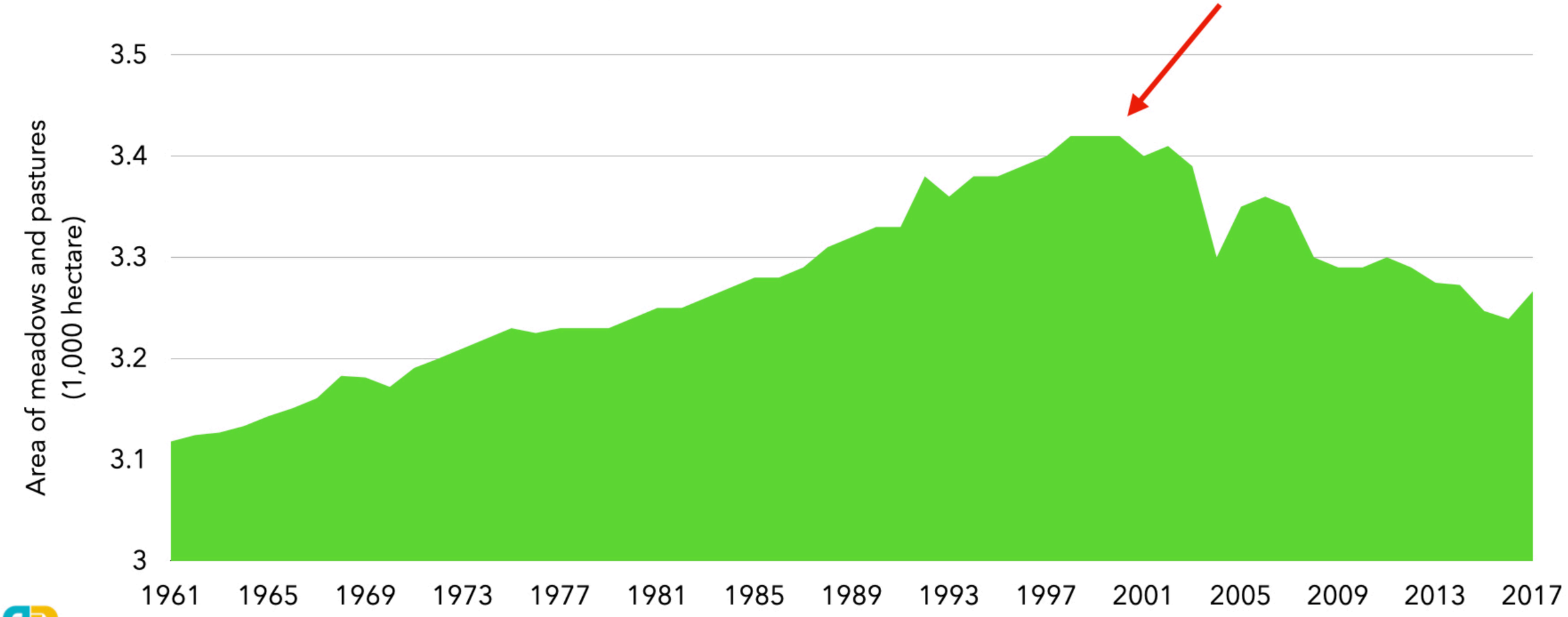


Between 1900 and 2010, the intensification of agriculture allowed Spain and France to reforest

ENVIRONMENTAL PROGRESS

Source: Rick Noack, "Watch: How Europe is greener now than 100 years ago," Washington Post, December 4, 2014.

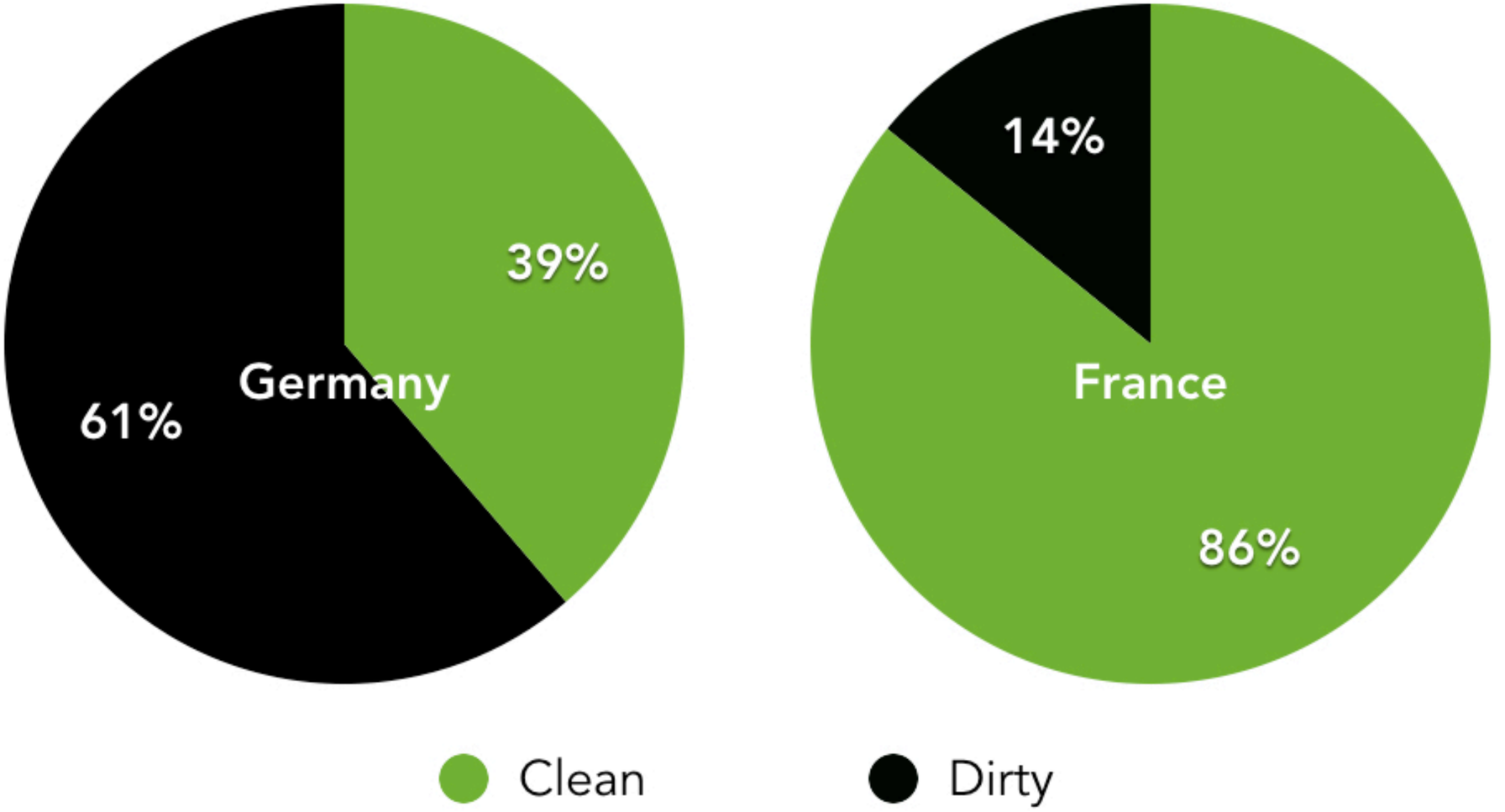
The total amount of land humankind uses to produce meat peaked in the year 2000. Since then, land used for livestock and pasture has decreased by an area **80% the size of Alaska**



ENVIRONMENTAL PROGRESS

Source: FAO, World Livestock: Transforming the livestock sector through the Sustainable Development Goals (Rome: FAO, 2018)

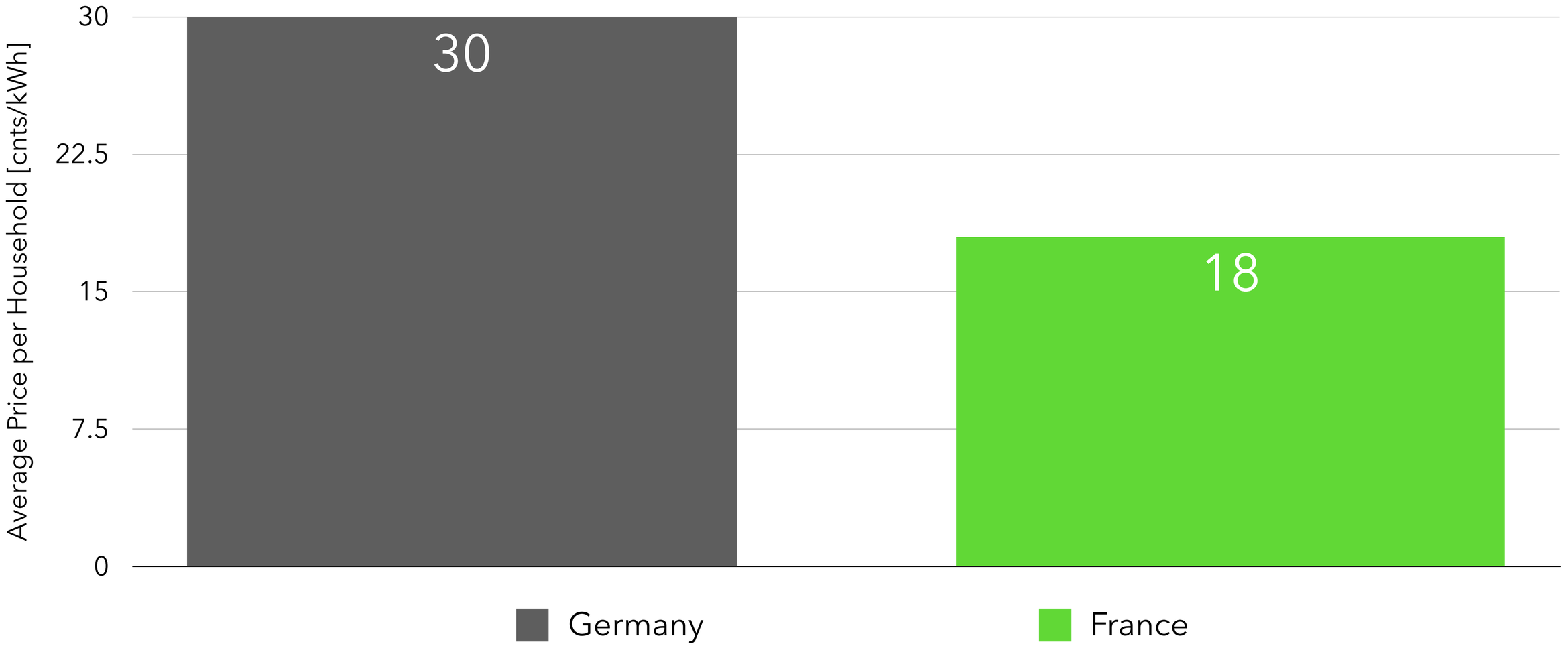
Carbon-Dependence of Electricity Supply



ENVIRONMENTAL PROGRESS

Source: Data for countries from BP Global Outlook 2019, referring to 2018 electricity generation. Data for U.S. states from U.S. Energy Information Agency, and also refers to 2018 electricity generation. Biomass combustion is classified as carbon-based fuel.

German electricity is nearly twice as expensive as French electricity



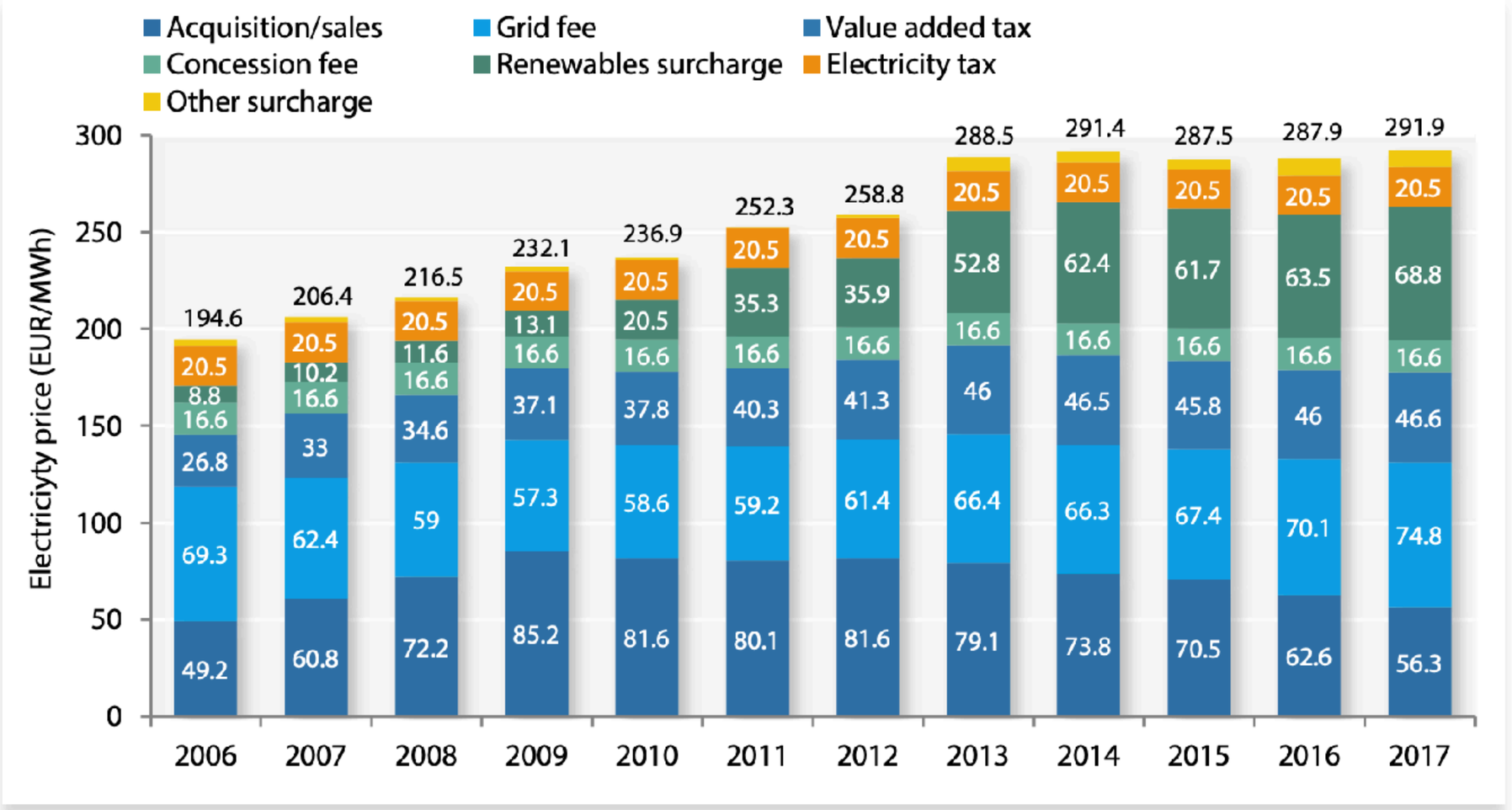
ENVIRONMENTAL PROGRESS

Source: Eurostat, 2018

German Power Prices Rose 50% – And Are Still Rising

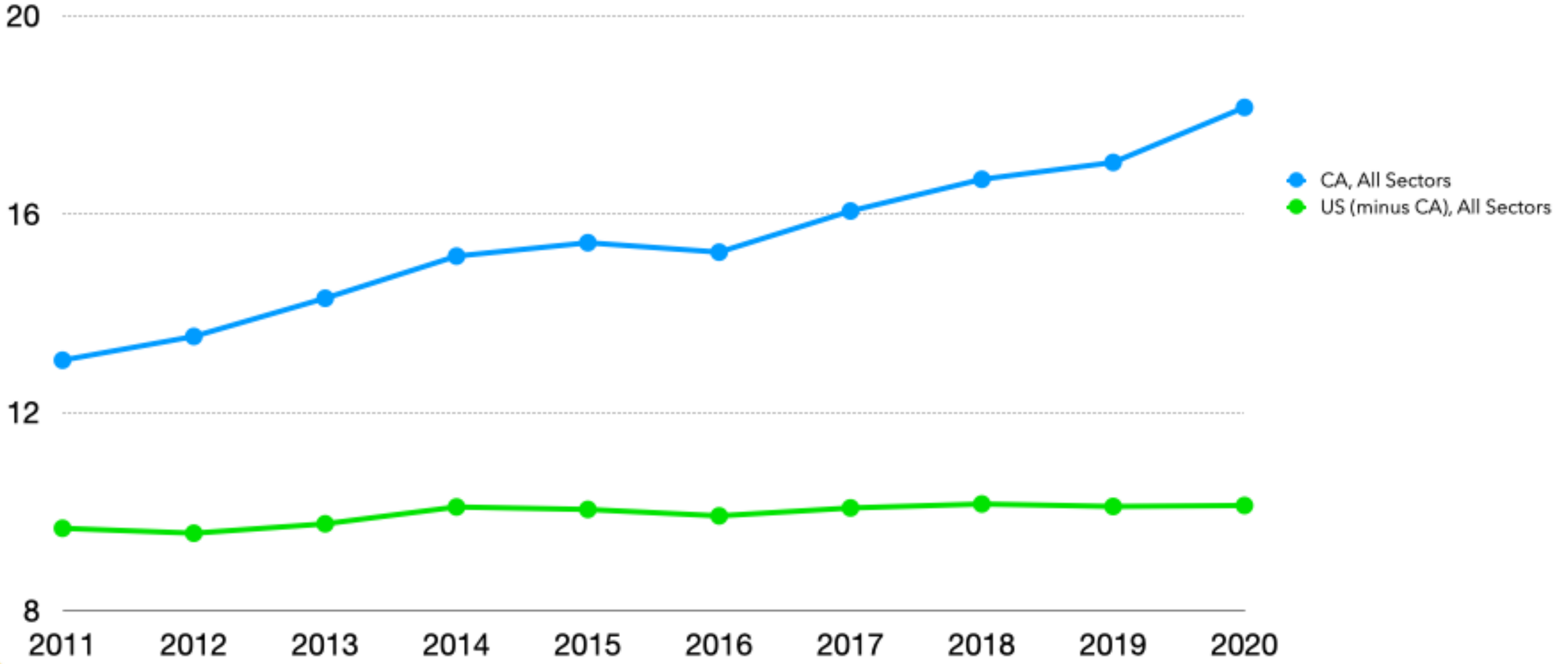
Figure 6. **Household electricity prices (<3 500 kWh per year) in Germany**

(Households with consumption of less than 3 500 kWh per year, EUR per MWh)



Source: Adapted from BDEW, 2017.

Electricity Prices in California rose 7x more than in rest of the U.S.



ENVIRONMENTAL PROGRESS

Source: U.S. Energy Information Administration, 2011-2020

It would require **15,280** storage centers the size of Escondido, the largest in California, to provide just **4 hours** of backup power for the U.S. grid — at an estimated cost of **$764 billion**

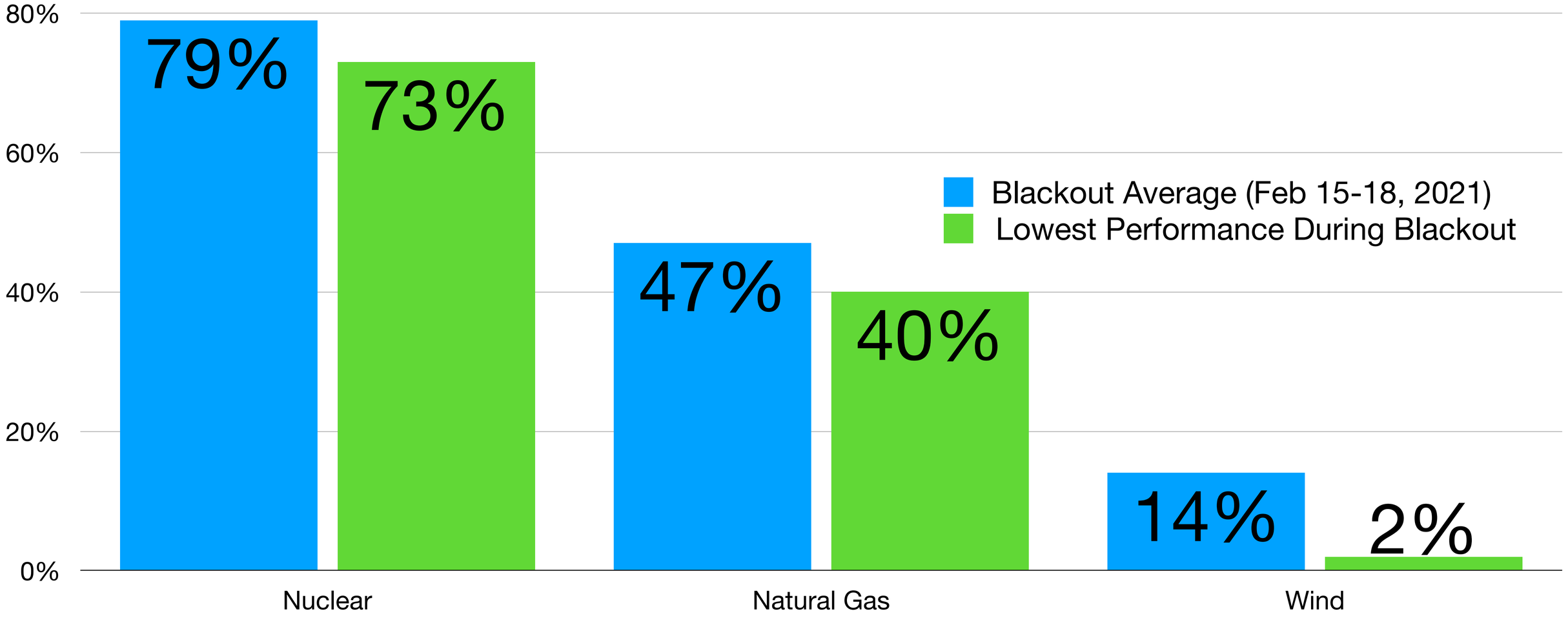
California Blackouts 2020

- Higher temps led to greater demand for air conditioning plus California had less electricity, including from wind energy, available.

- While California is hot, weather conditions were well within the normal range for the state’s summer weather.

- The underlying reason blackouts occurred is because California had closed both natural gas and nuclear power plants, according to grid operator.

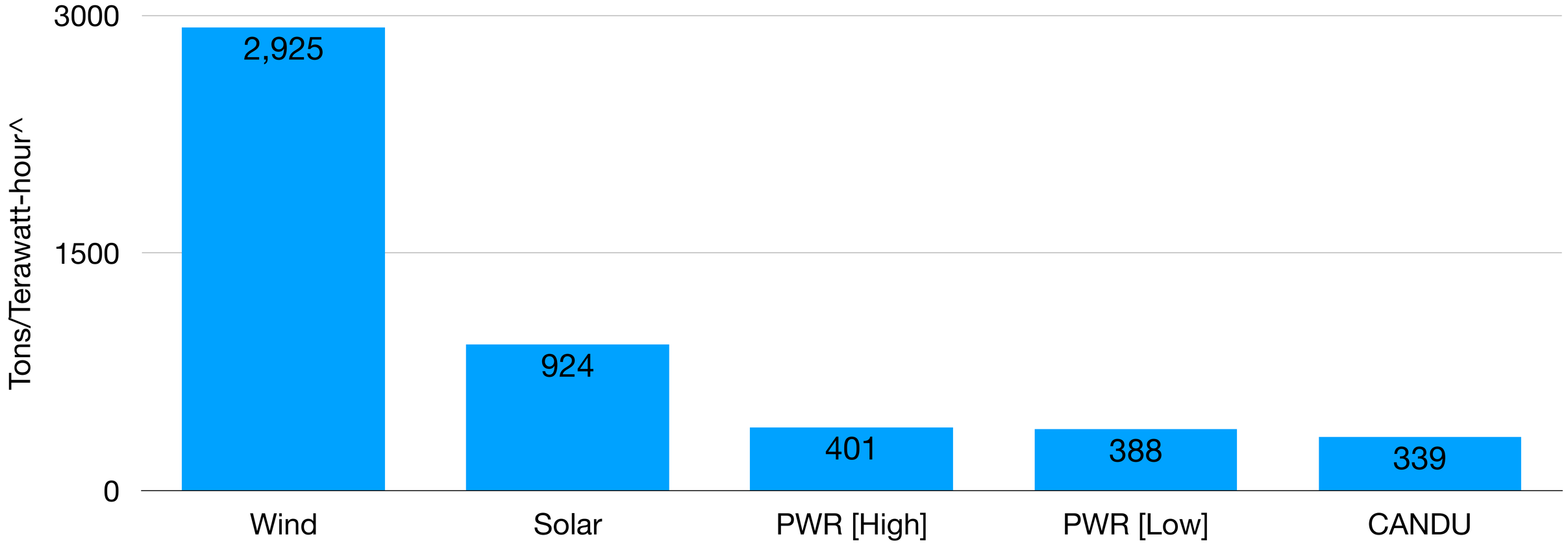
Performance of Different Energy Sources in Texas Electricity Grid During February 2021 Blackouts



ENVIRONMENTAL PROGRESS

Source: U.S. Energy Information Administration, "EIA-930", EIA.gov, accessed March 22, 2021, https://www.eia.gov/beta/electricity/gridmonitor/dashboard/electric_overview/US48/US48. Installed capacity from: EIA, "EIA-860M", EIA.gov, accessed March 22, 2021, https://www.eia.gov/electricity/data/eia860M

Lifecycle* Concrete Use by Energy Source



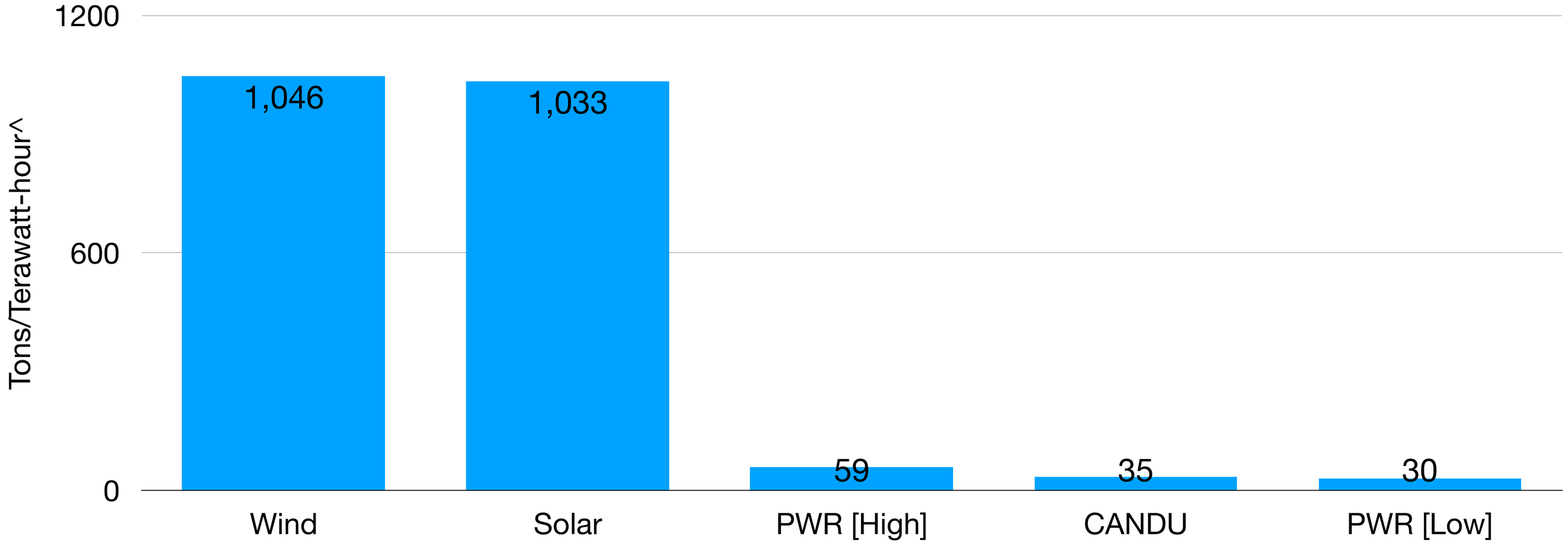
*Includes construction, operation, and decommissioning

^One terawatt-hour of electricity powers approximately 90,000 American households every year

Calculated using data from Alves, Dias, *Raw Materials Demand for Wind and Solar PV technologies in the Transition towards a Decarbonised Energy System,* JRC, European Commission, April 2020; and JRC, *Technical Assessment of Nuclear Energy*, European Commission, February 2021

ENVIRONMENTAL PROGRESS

Lifecycle* Steel Use by Energy Source



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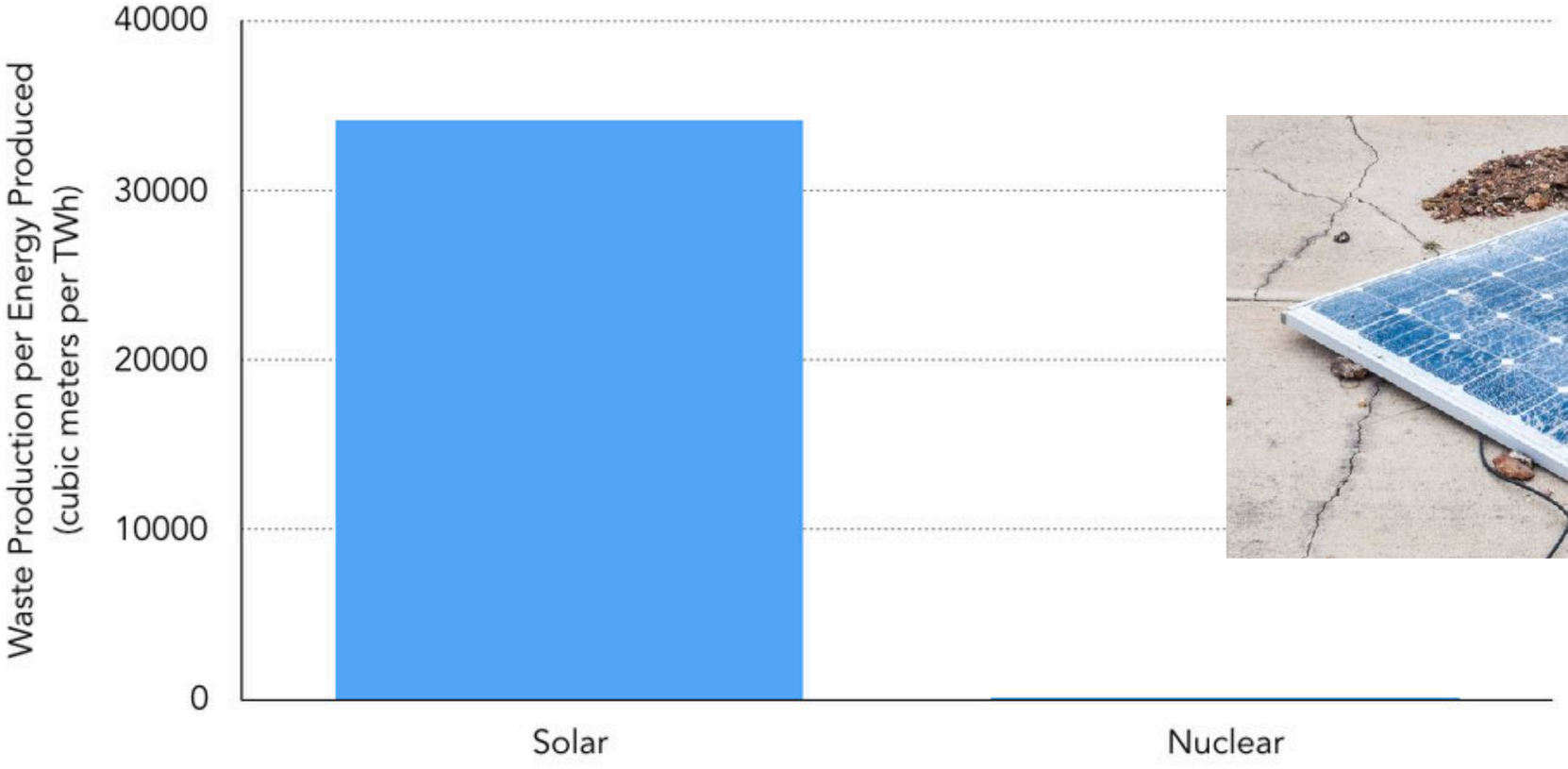
ENVIRONMENTAL PROGRESS

Solar panels produce ~300x more waste than nuclear reactors when providing the same amount of energy.



Sources and Notes:

US GAO, http://www.gao.gov/key_issues/disposal_of_highlevel_nuclear_waste/issue_summary

World Nuclear Association, http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/nuclear-wastes/radioactive-waste-management.aspx

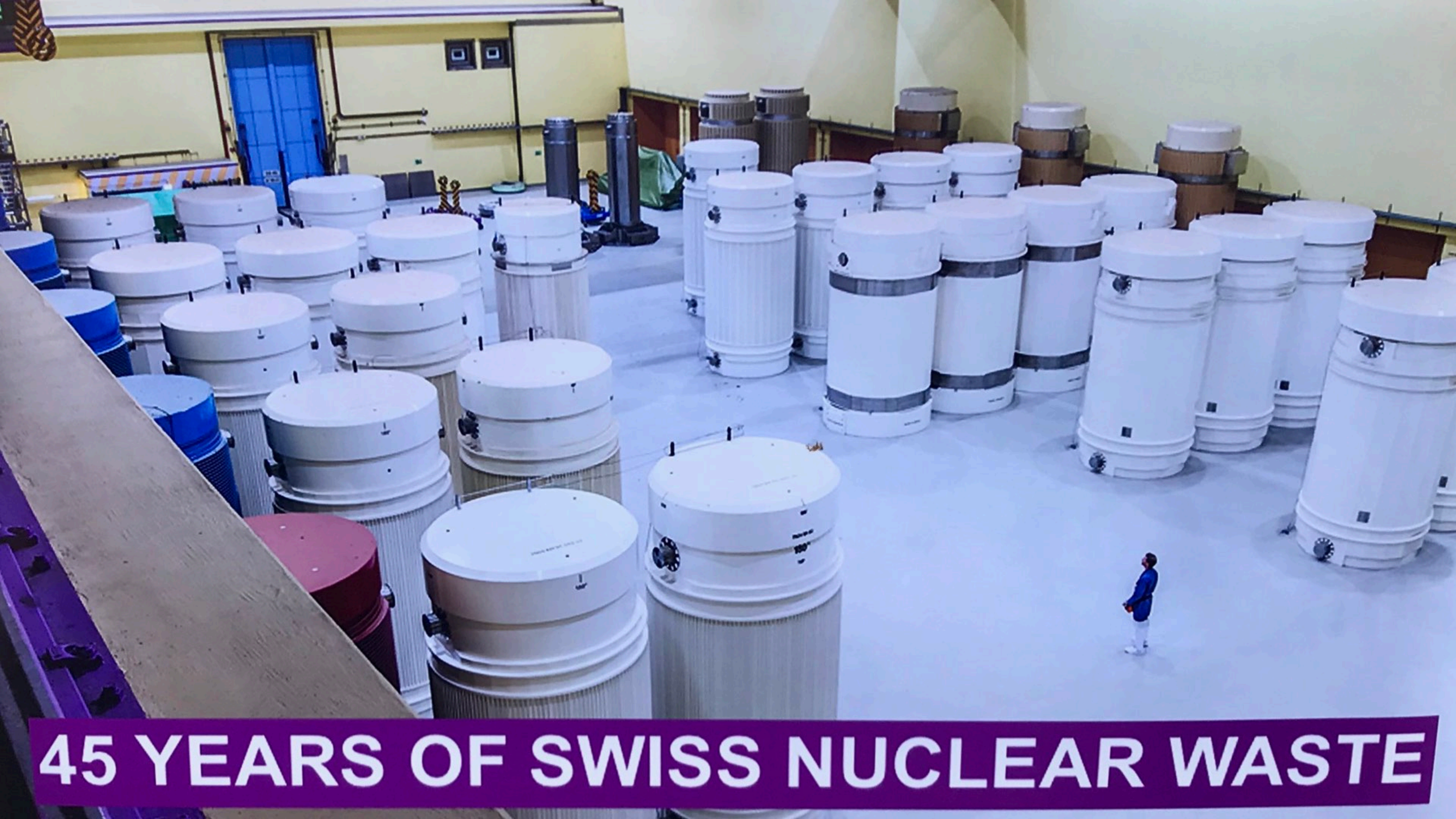
http://www.world-nuclear.org/information-library/facts-and-figures/world-nuclear-power-reactors-archive/reactor-archive-december-2015.aspx

IAEA, https://www.iaea.org/PRIS/home.aspx

BP, http://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html

Solar panels specifications vary. Panel specifications were standardized according to TrinaSolar's Duomax Dual Glass 60-Cell Module:
http://static.trinasolar.com/sites/default/files/PS-M-0474%20A%20Datasheet_Duomax_PEG5.XX_US_Feb_2017_A.pdf

ENVIRONMENTAL PROGRESS


45 YEARS OF SWISS NUCLEAR WASTE

Coastal nuclear plants in the Philippines would require 180 times less land than solar...

ENVIRONMENTAL PROGRESS

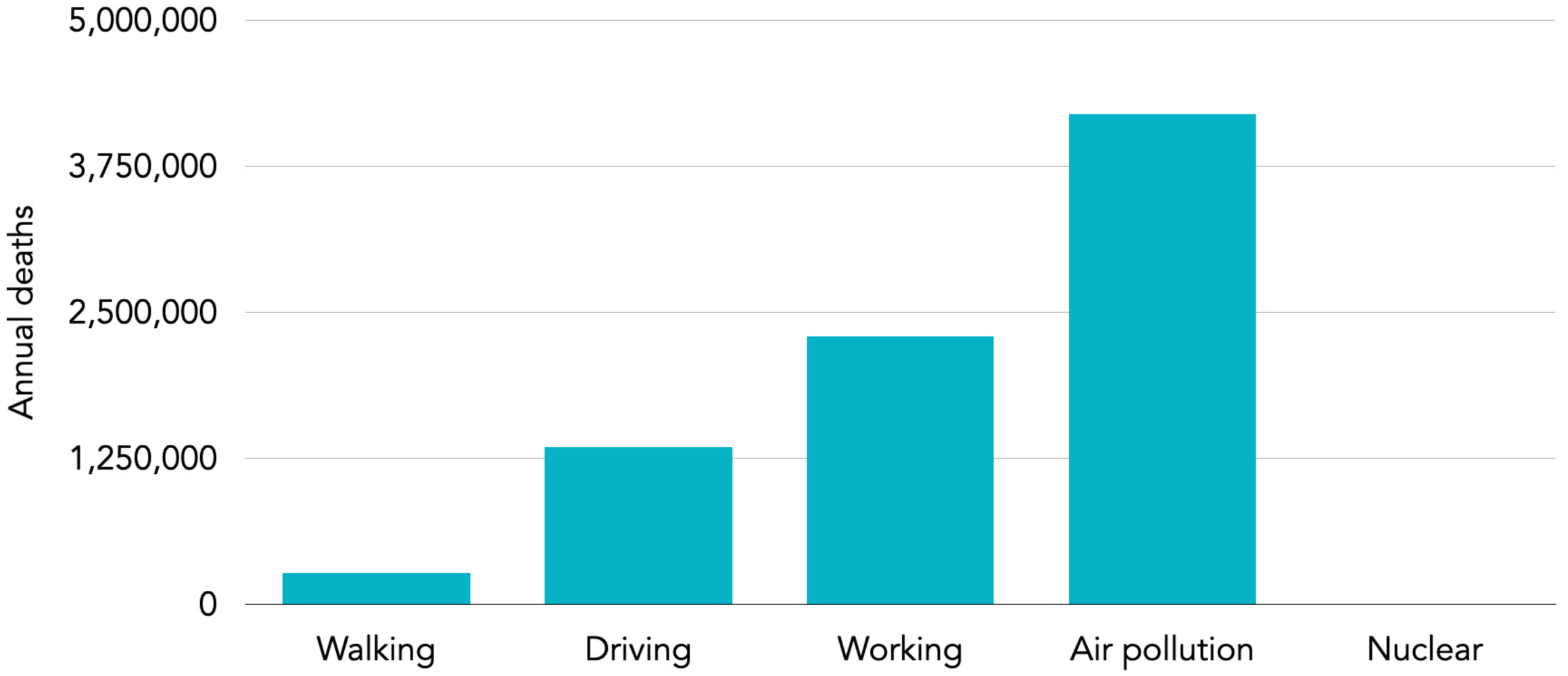
Source: Comparison between a facility like Bataan Nuclear Plant if operated, and assumed production from Cadiz City solar farm. If operated at 85% capacity factor, Bataan's 570 megawatt (net) capacity would produce 4.3 terawatt-hours per year on an approximate land area of 0.2 square kilometers, for a density of 21.6 terawatt-hours per square kilometer. Cadiz City as detailed in (8) has a power density of 0.12 terawatt-hours per square kilometer.

...and 400 times less area than wind.

Source: Comparison between a facility like Bataan Nuclear Plant if operated, and assumed production from Burgos wind farm. If operated at 85% capacity factor, Bataan's 570 megawatt (net) capacity would produce 4.3 terawatt-hours per year on an approximate land area of 0.2 square kilometers, for a density of 21.6 terawatt-hours per square kilometer. Cadiz City as detailed in (12) has a power density of 0.05 terawatt-hours per square kilometer.

ENVIRONMENTAL PROGRESS

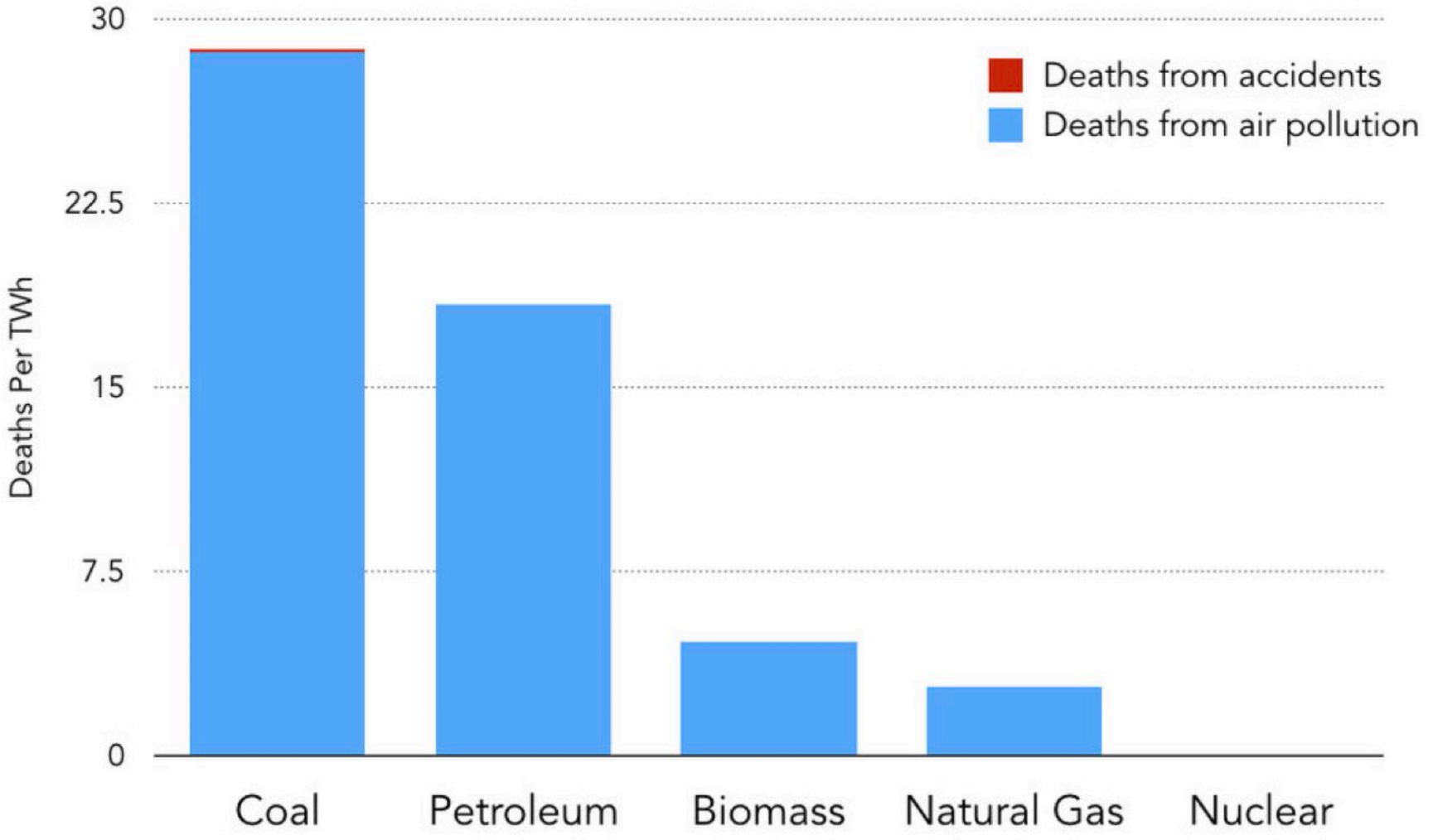
Comparative Risk



ENVIRONMENTAL PROGRESS

Source: "Pedestrian Safety: A Road Safety Manual for Decision-Makers and Practitioners," United Nations Road Safety Collaboration; "World Statistic," International Labour Organization; "Ambient Air Pollution: Health Impacts," World Health Organization; "Global Status Report on Road Safety 2018," World Health Organization; Jemin Desai et al., "Nuclear Deaths," Environmental Progress

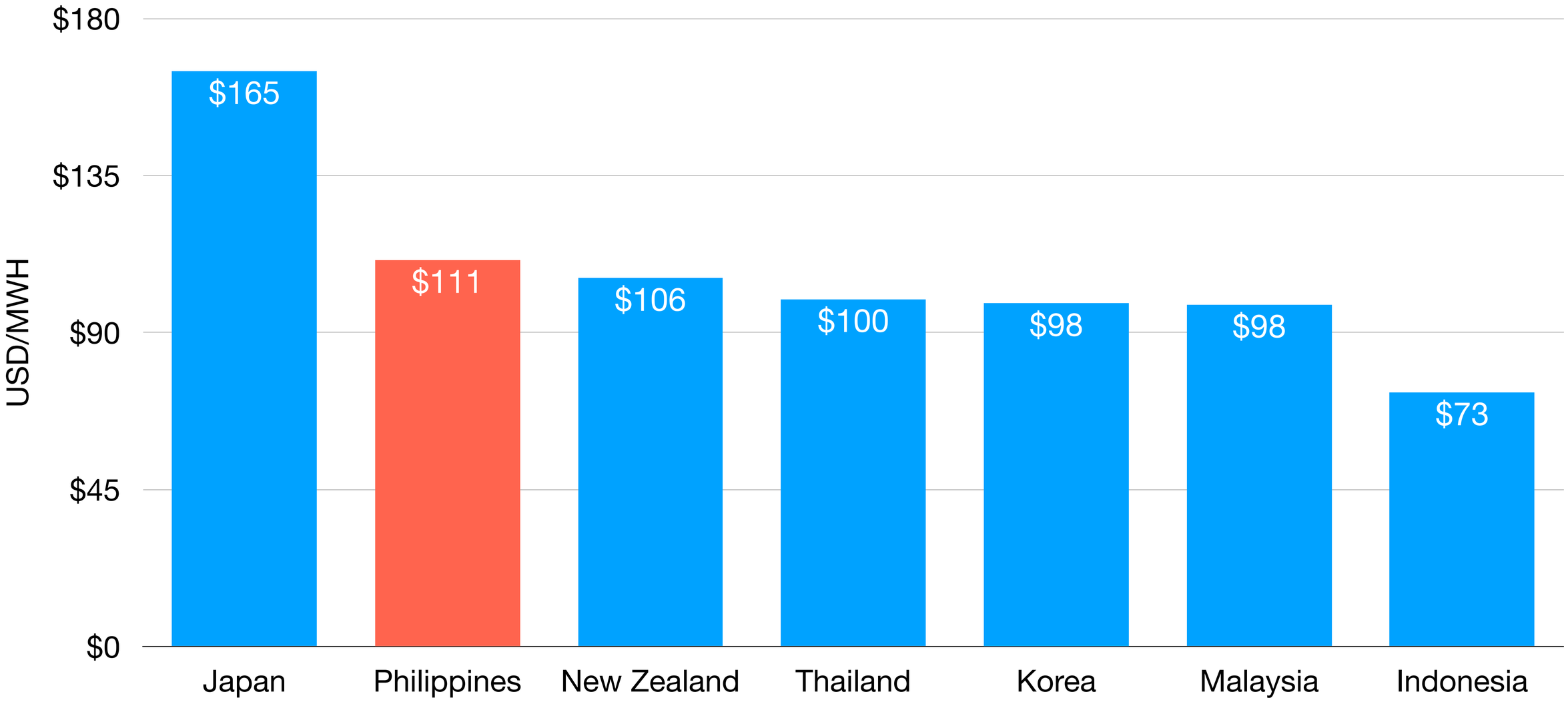
Nuclear is already the safest way to make reliable electricity.



ENVIRONMENTAL PROGRESS

Source: Markandya, A., & Wilkinson, P. 2007. Electricity generation and health. *The Lancet*, *370*(9591), 979-990.

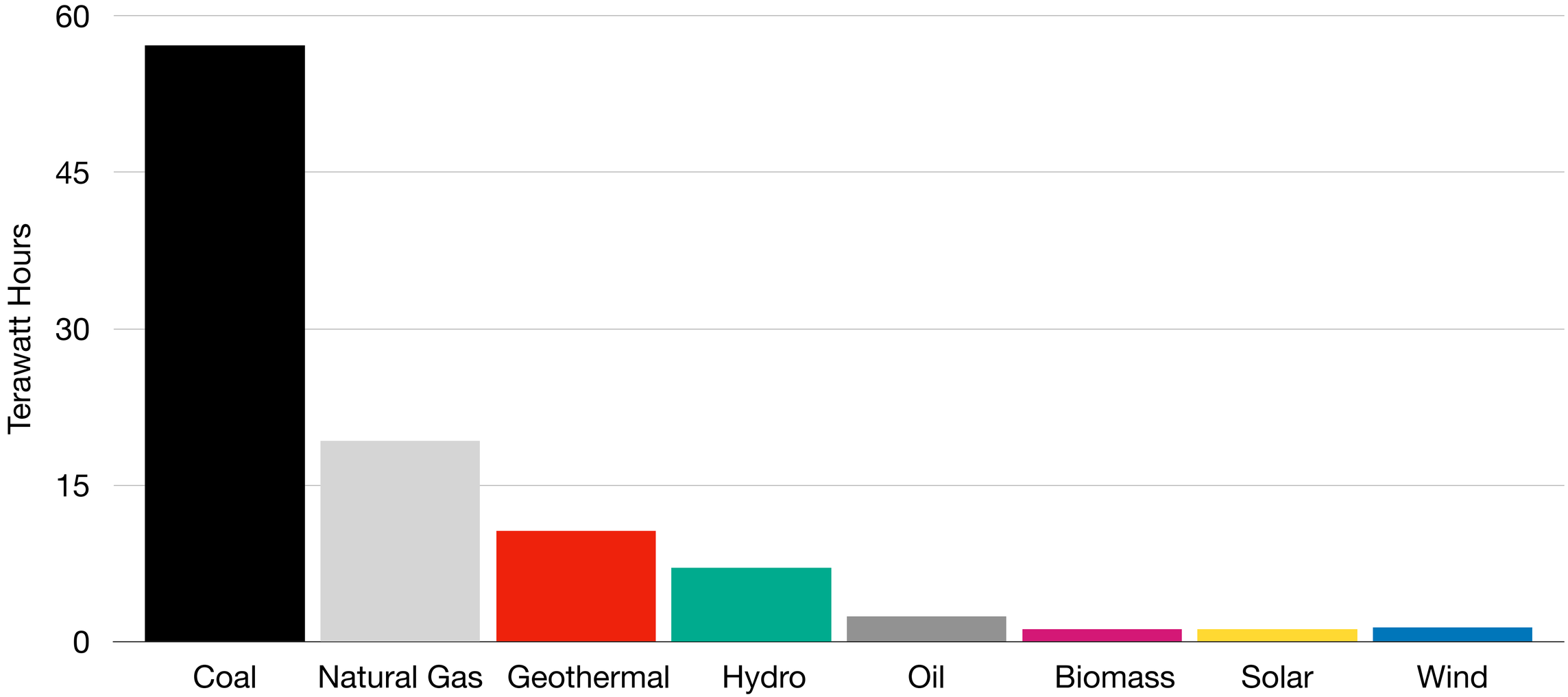
Industrial Electricity Prices



ENVIRONMENTAL PROGRESS

Electricity Tariffs as of Sources: Philippines DOE; Thailand BOI; New Zealand Ministry of Business; Malaysia TNB; Indonesia Ministry of Energy and Mineral Resources; OECD Energy Prices and Taxes for OECD Countries

Philippines 2020 Electricity Fuel Mix



ENVIRONMENTAL PROGRESS

Source: Philippines Department of Energy