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FROM CRISIS TO GROWTH: SECURITY CHALLENGES TO AFFORDABLE AND RELIABLE ENERGY

(Understanding the Trump Administration's Energy Initiatives)

Presentation

The Canon Institute for Global Studies
Tokyo

February 28, 2025 (virtual)

Major Energy Initiatives of the Trump Administration

1. Advance Energy Addition, Not Subtraction
2. Unleash American Energy Innovation
3. Return to Regular Order on LNG Exports
4. Promote Affordability and Consumer Choice in Home Appliances
5. Refill the Strategic Petroleum Reserve (SPR)
6. Modernize America's nuclear stockpile
7. Unleash Commercial Nuclear Power in the United States
8. Strengthen Grid Reliability and Security
9. Streamline Permitting on American Energy

Annual CO_2 Emissions by Region (1900-2023)

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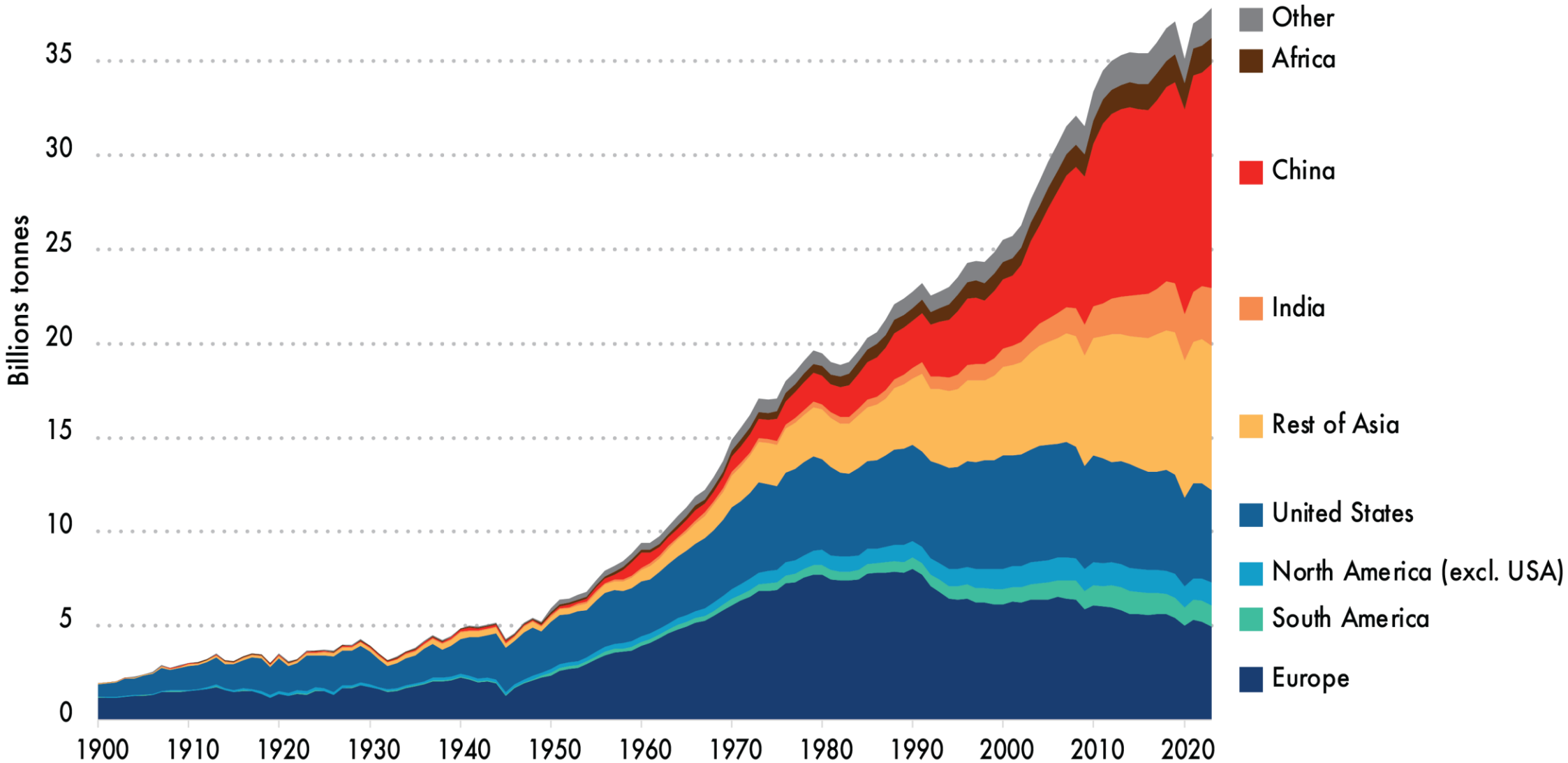
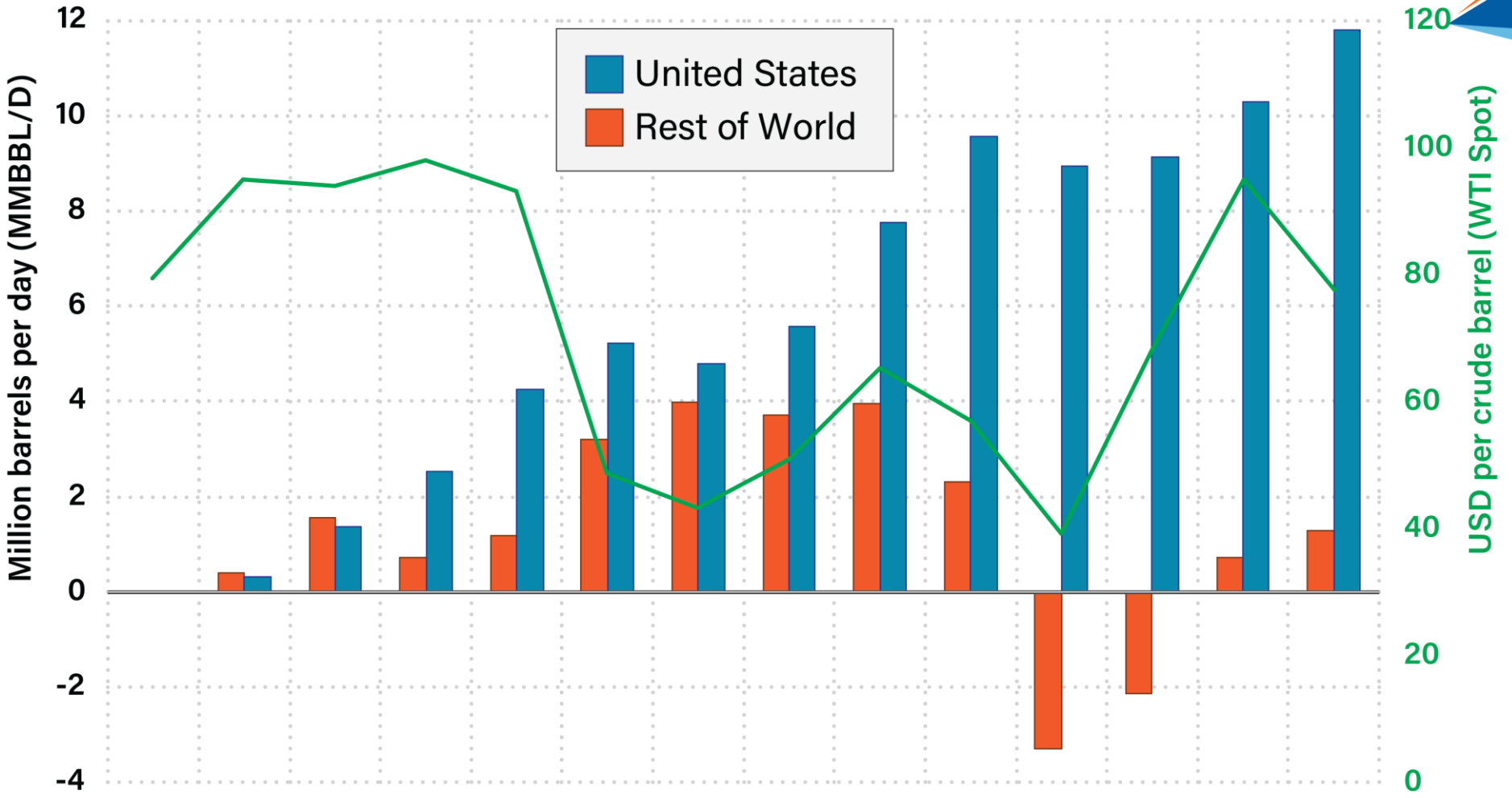


Source: Global Carbon Budget

Change in Global Oil* Production Compared to 2010



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
US	0	0.3	1.4	2.5	4.2	5.2	4.8	5.6	7.8	9.6	8.9	9.1	10.3	11.8
RoW	0	0.4	1.6	0.7	1.2	3.2	4.0	3.7	3.9	2.3	**-3.3**	**-2.1**	0.7	1.3

*Oil includes crude oil, shale oil, oil sands, condensates and NGLs.
Source: Energy Policy Research, data from Energy Institute (UK)

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From 2010-2023 the US incremental oil production supplied 82% of the growth in world oil demand during the 13 year period.

Production Growth Affords US a Strategic Advantage

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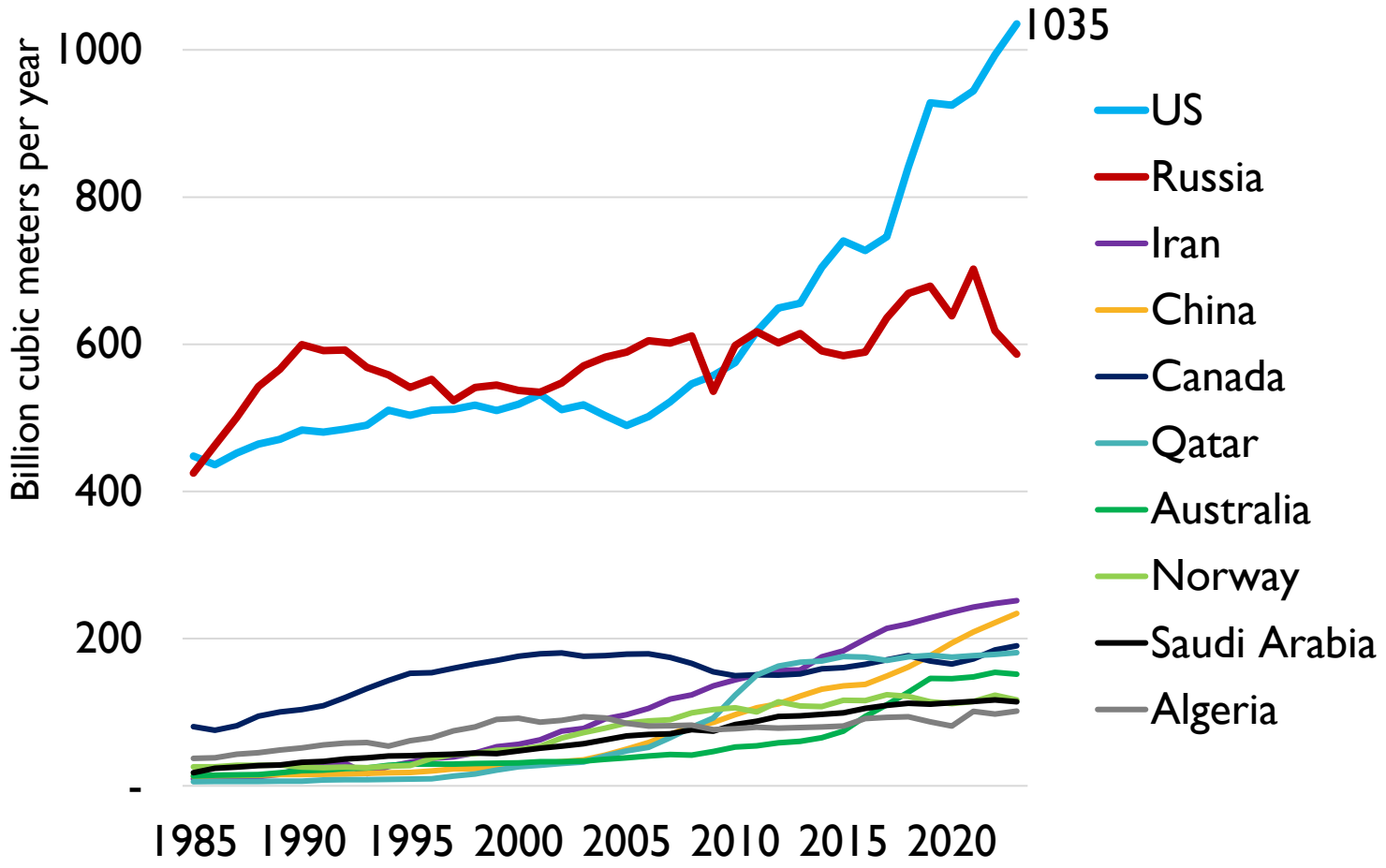
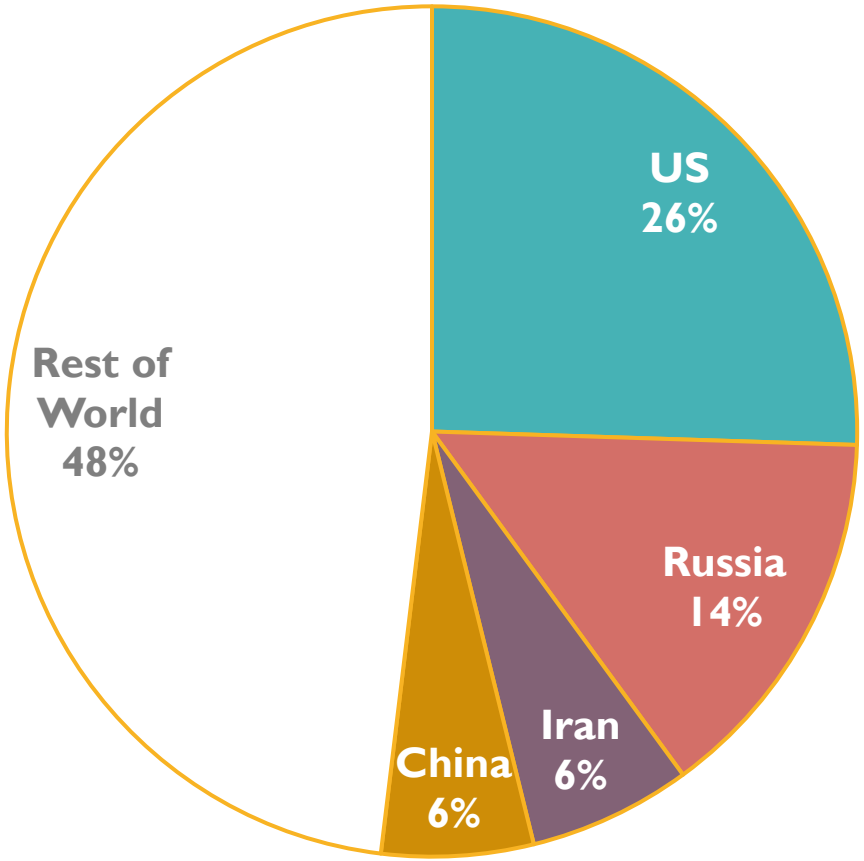
Current Top 10 Natural Gas Producers (1985-2023)



'Big 4' >50% of Supply (2023)



Source: EPRINC, data from Energy Institute

FOSSIL FUELS ARE DIFFCULT TO REPLACE

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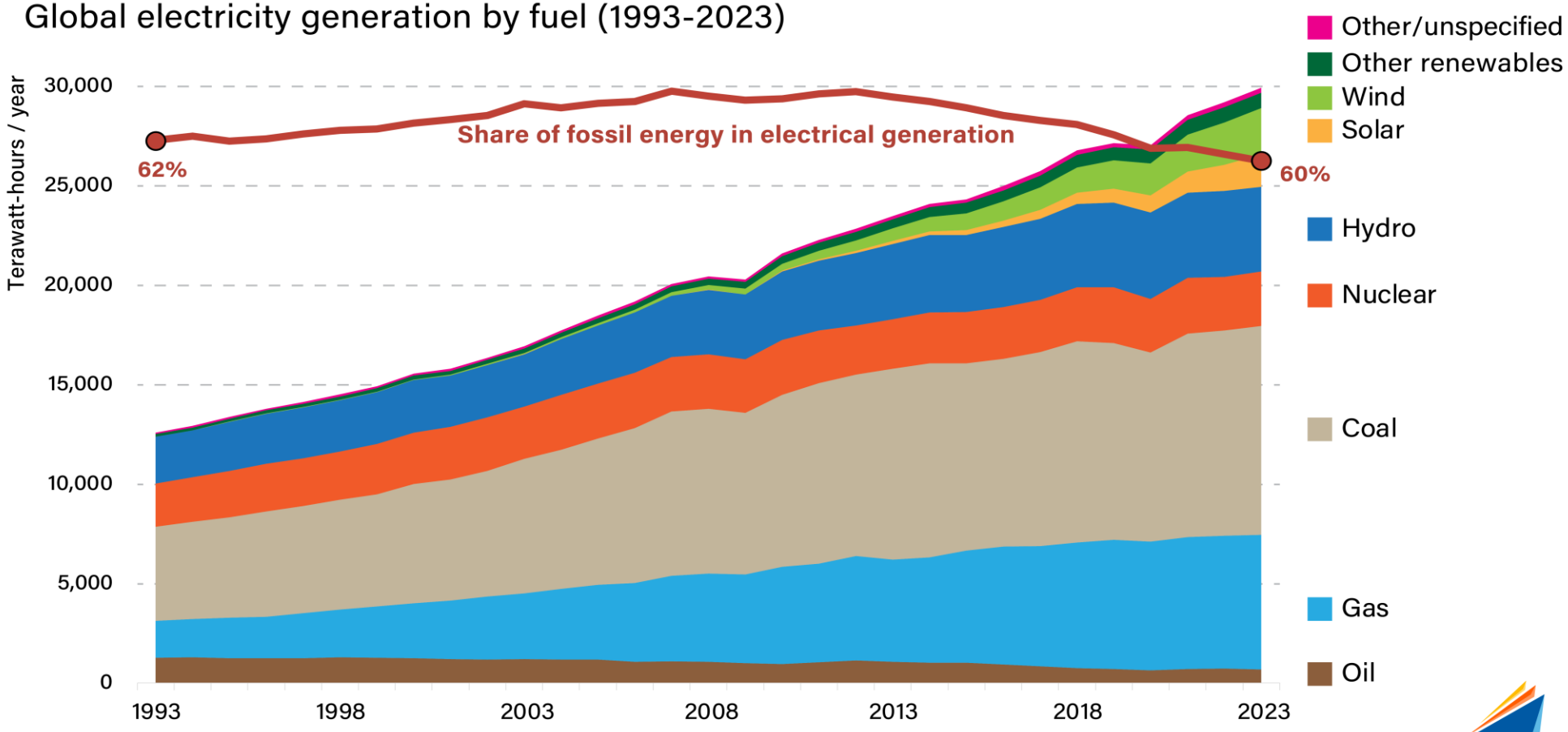
Fossil share still at 60% of power generation after 30 years

Global electricity generation by fuel (1993-2023)



Source: Energy Policy Research; data from Energy Institute

AFRICA NEEDS DENSE POWER TO IMPROVE THE HUMAN CONDITION

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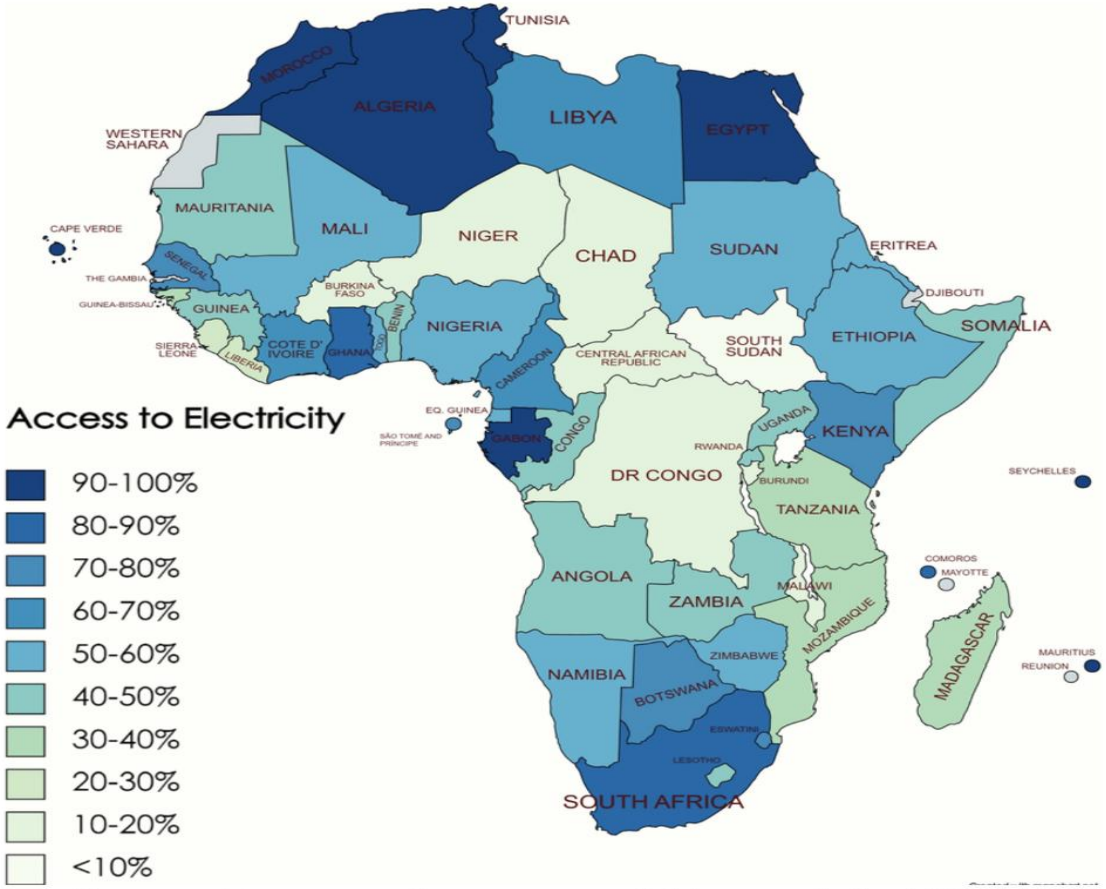
Energy Poverty in Africa is Reinforcing High Mortality and Disease



Source: Freeman, Lawrence, ***Africa and the World.***
https://lawrencefreemanafricaandtheworld.com/2024/04/27/energy-poverty-is-killing-africans-renewables-are-insufficient/

Net Zero: "All countries co-operate towards achieving net zero emissions worldwide."

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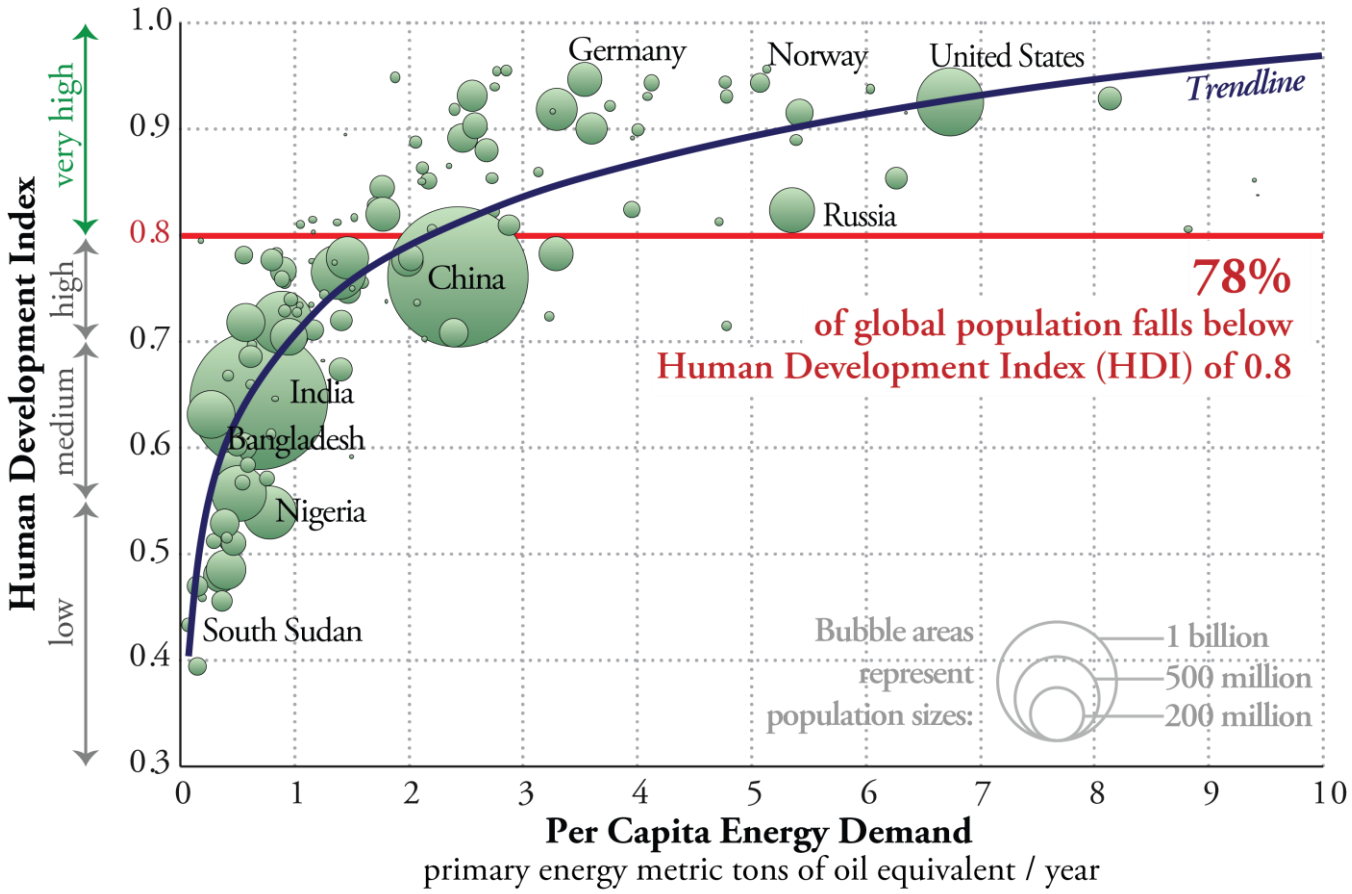
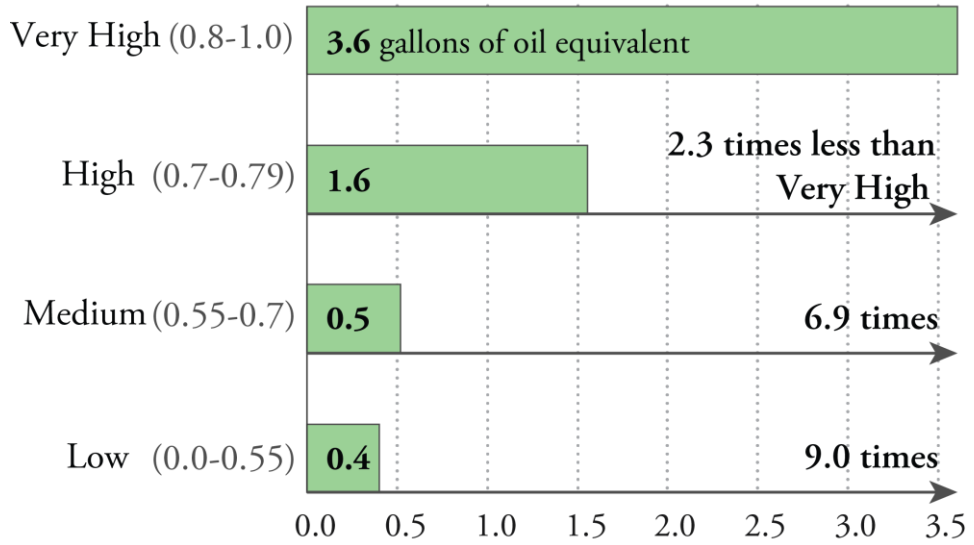
Per Capita Energy Demand and Human Development Index (2019)

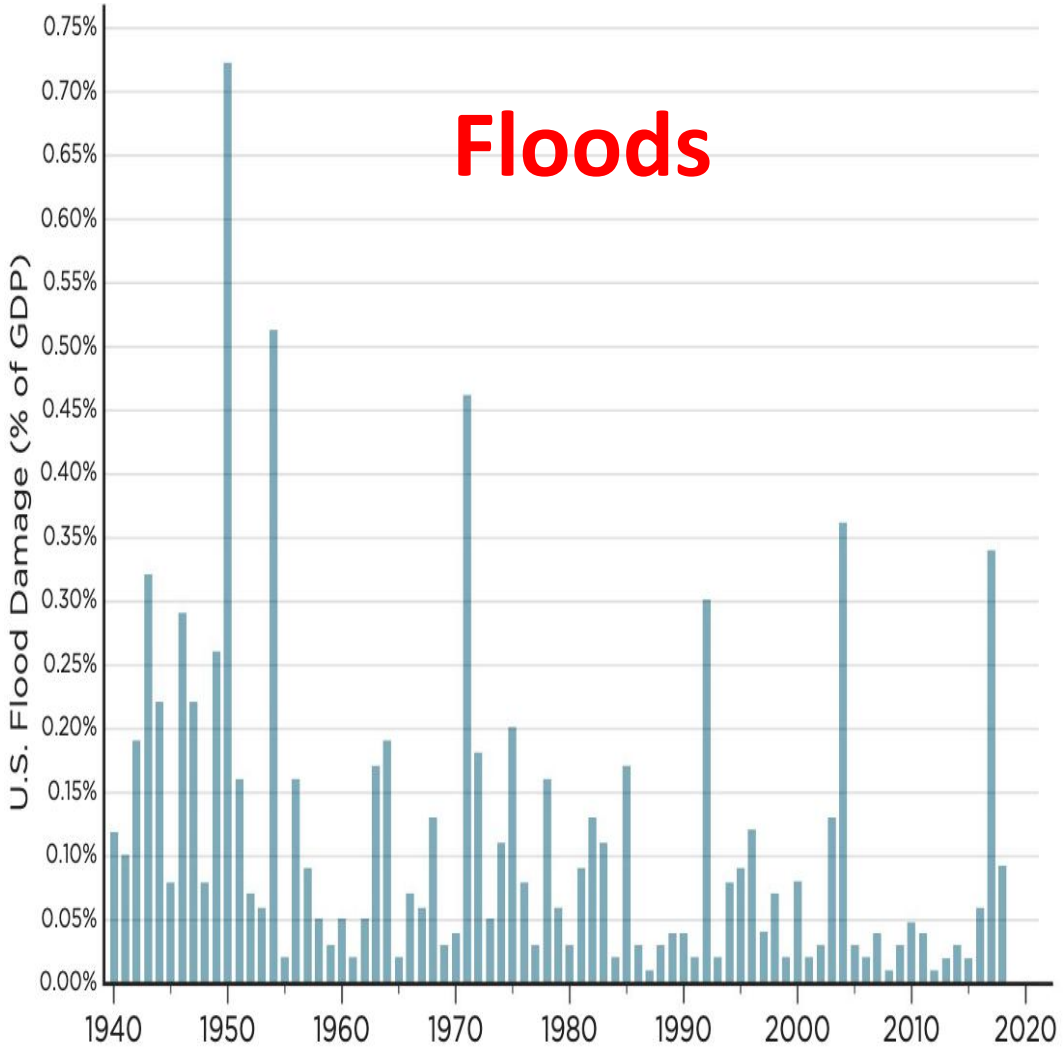


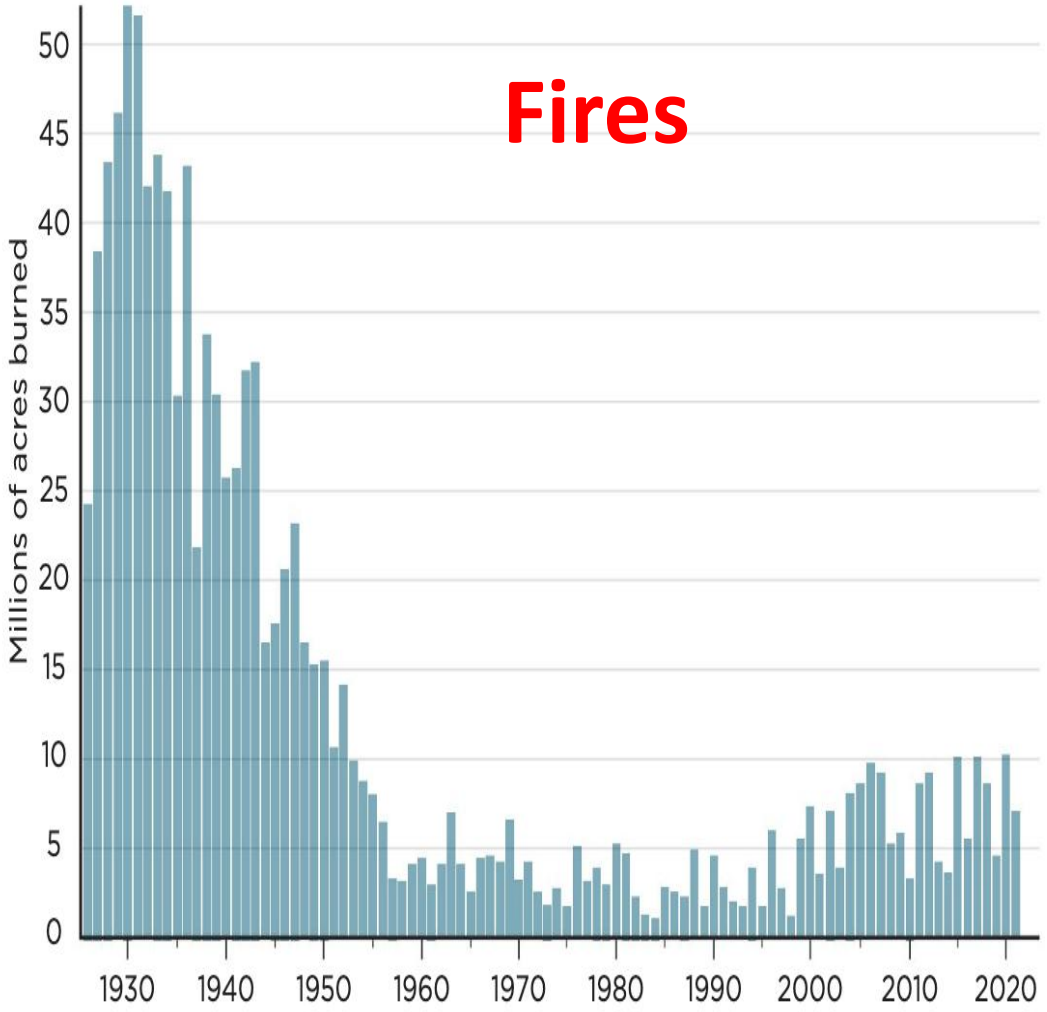
Source: Energy Policy Research, IEA, UN

Daily per Capita Energy Demand by HDI (2019)



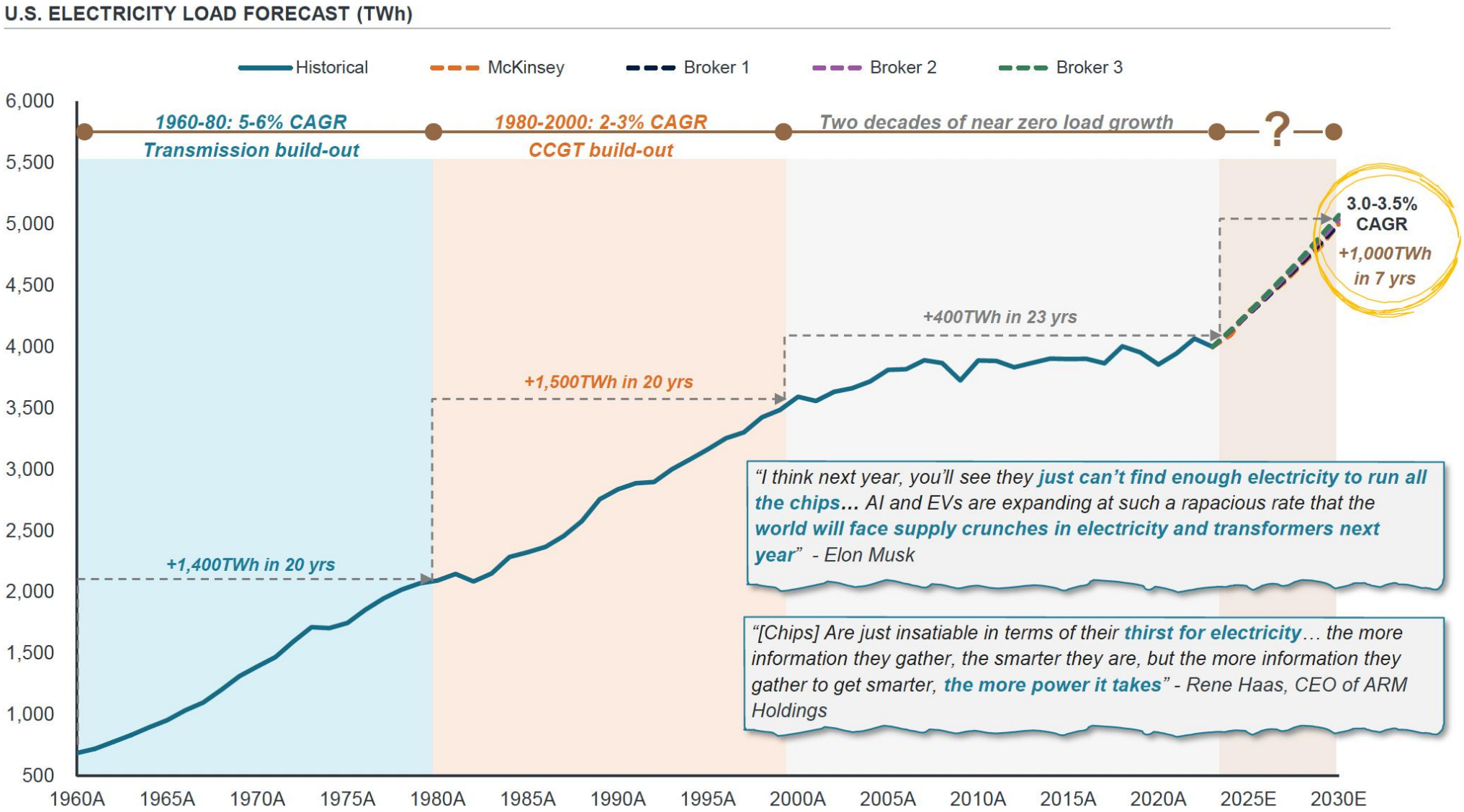
United States: Flood and Fire Damage





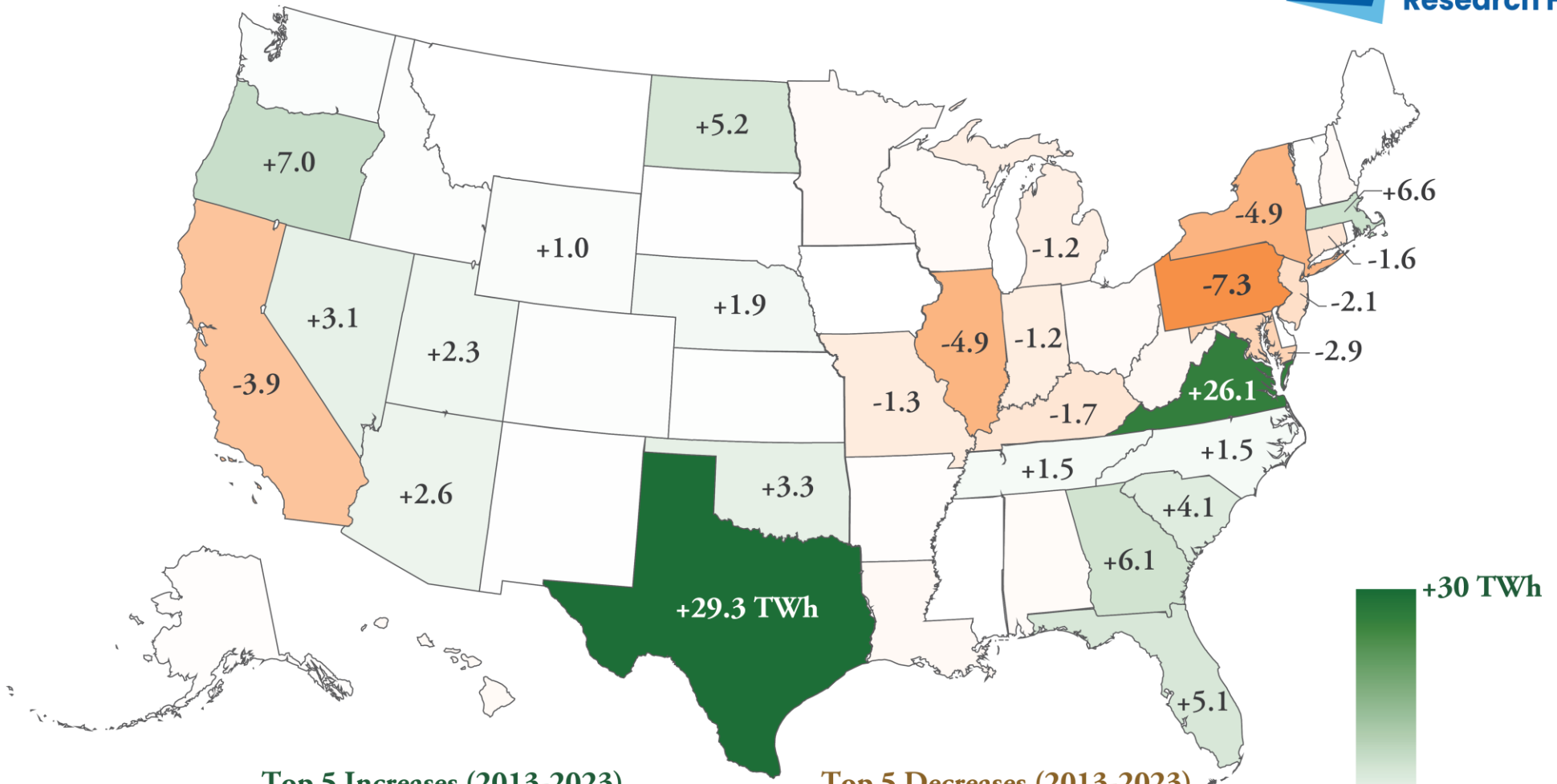
Source: US Forest Service, USG publications

US Electricity Load Growth Forecast: JPMorgan



Source: JPMorgan

Change in Commercial Sector Electricity Sale (2013-2023)



Top 5 Increases (2013-2023)

1.	Texas	+29.3 TWh
2.	Virginia	+26.1 TWh
3.	Oregon	+7.0 TWh
4.	Massachusetts	+6.6 TWh
5.	Georgia	+6.1 TWh

Top 5 Decreases (2013-2023)

1.	Pennsylvania	-7.3 TWh
2.	New York	-4.9 TWh
3.	Illinois	-4.9 TWh
4.	California	-3.9 TWh
5.	Maryland	-2.9 TWh

Data: US EIA

Data Centers, Internet, Crypto…

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Top 10 electrcity consumers in 2022 (TWh)	
1. China	8,849
2. US	4,548
3. India	1,858
4. Russia	1,167
5. Japan	1,034
6. Brazil	677
7. Canada	660
8. S. Korea	620
9. Germany	577
10. France	468

Energy consumption in 2022 (TWh): IEA estimate	
Data centers	240-340
Data transmis-sion networks	260-360
Crypto mining	100-150
Total	**600-850**

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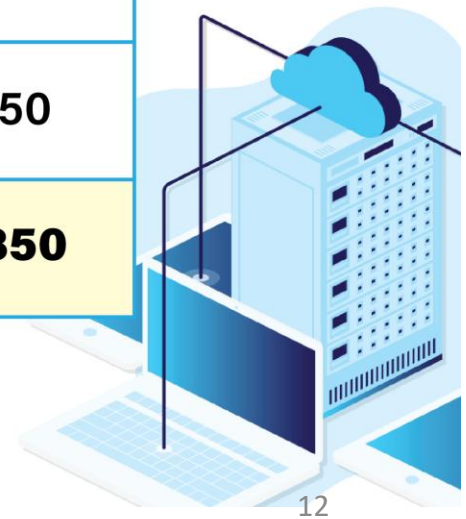
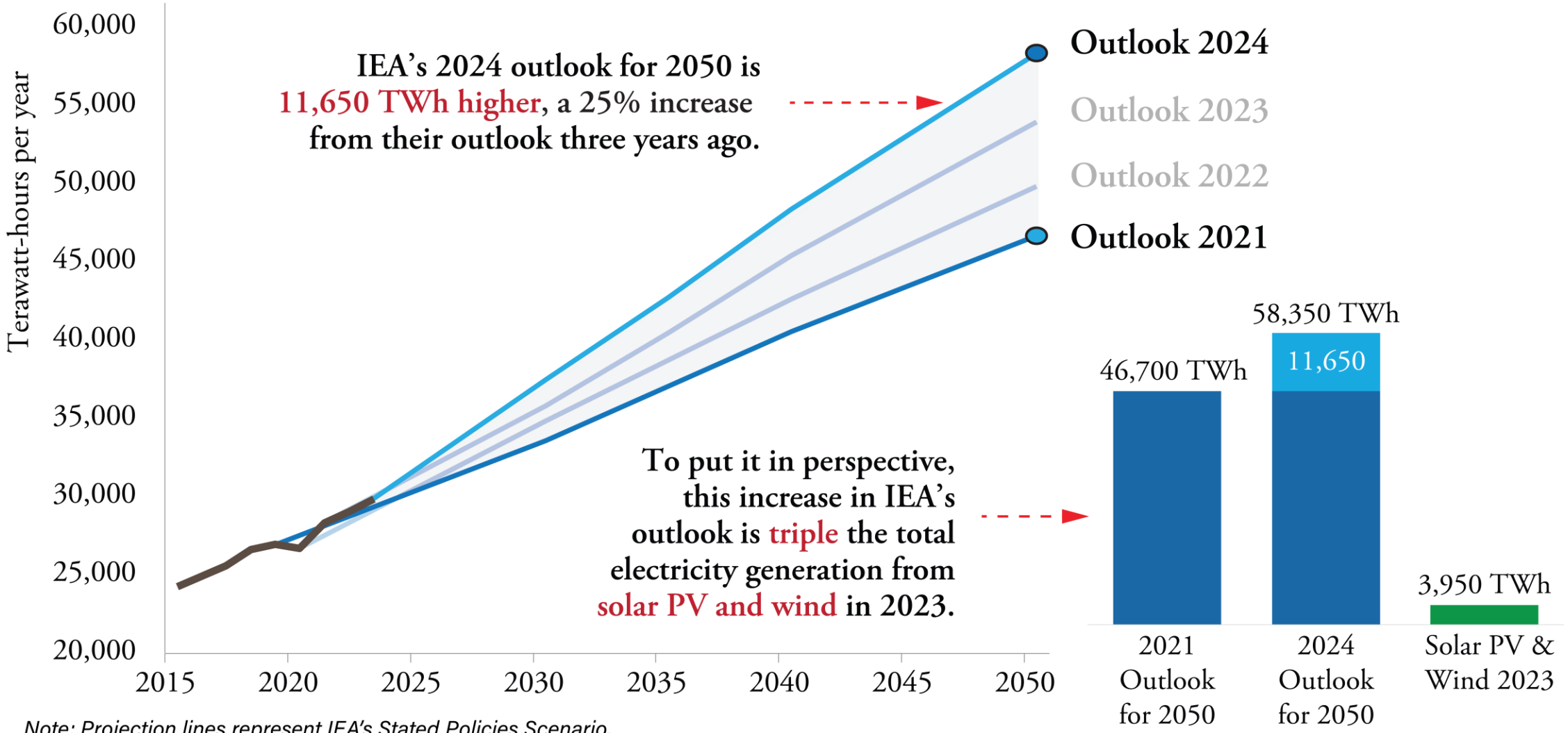
The combined electricty demand of data centers, data transmission networks, and crypto mining, when compared with countries.

Data: IEA, BP



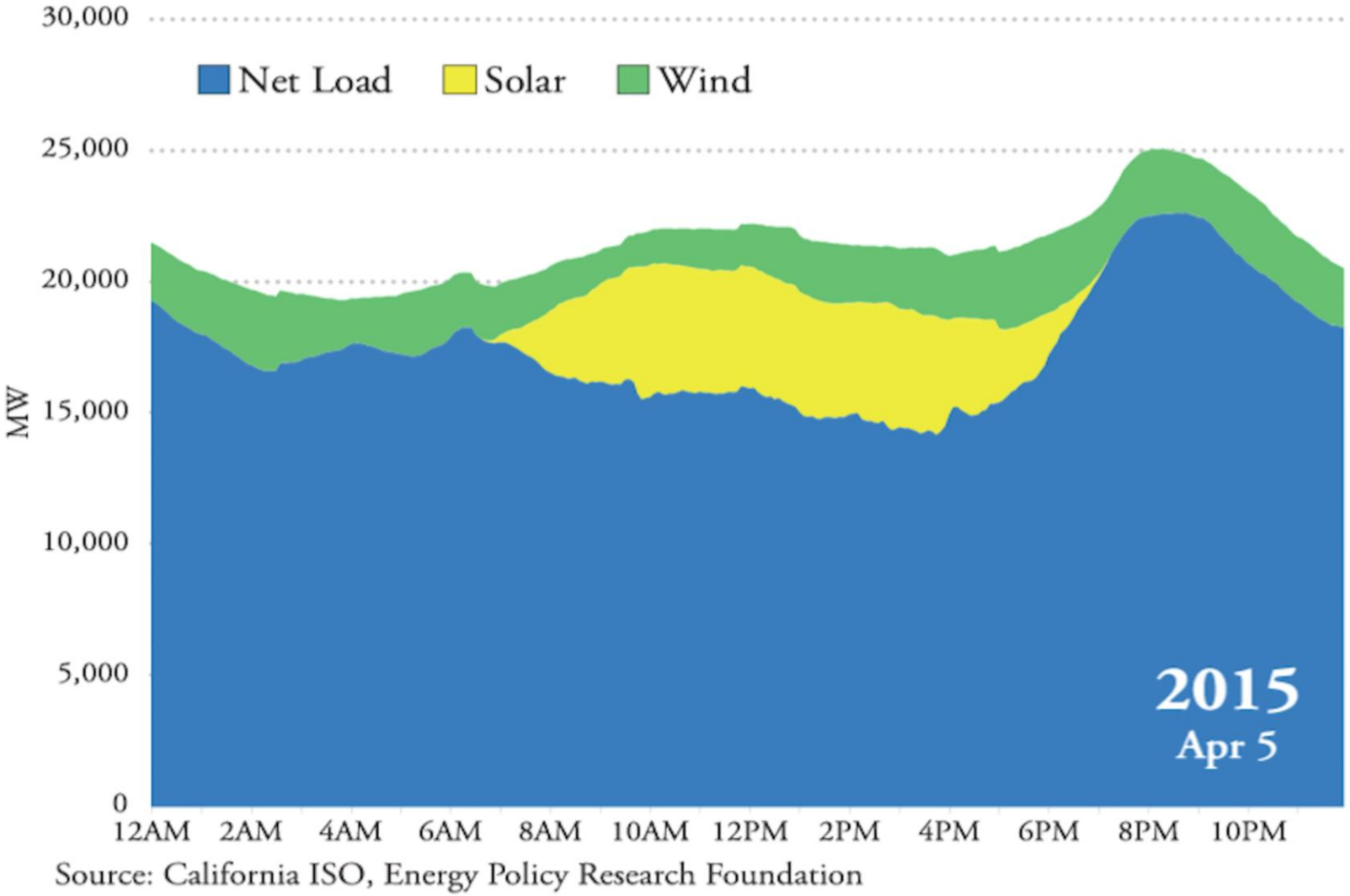
IEA's World Electricity Generation Outlooks to 2050



Note: Projection lines represent IEA's Stated Policies Scenario.
Source: Energy Policy Research based on IEA's World Energy Outlook data

From Duck Curve to Canyon Curve

CAISO's lowest annual net load day (2015-2023)



Source: California ISO, Energy Policy Research Foundation

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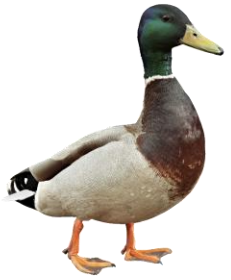
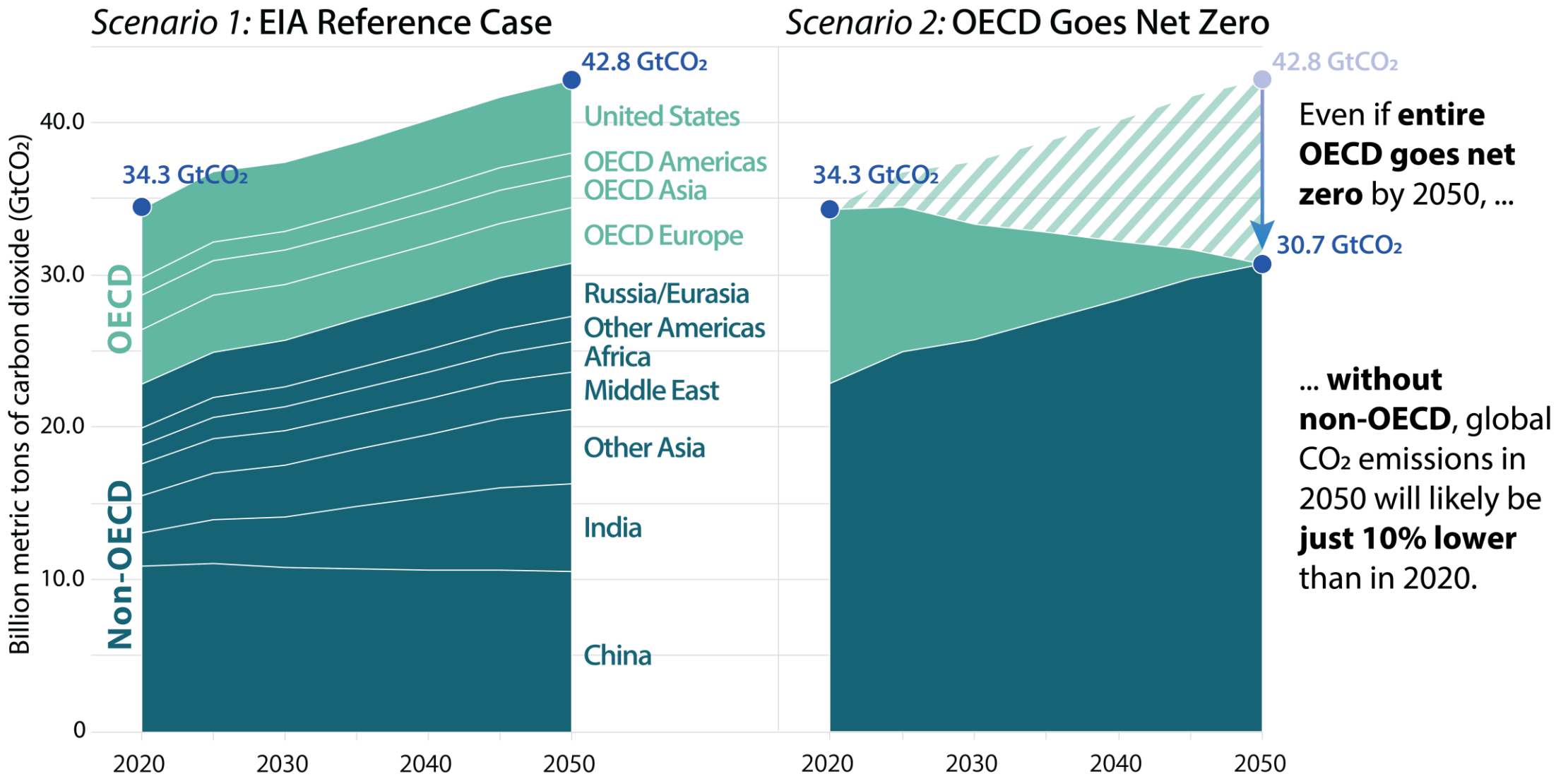
New challenges per CAISO:

- Short, steep ramps
- Oversupply risks
- Decreased frequency response



Global CO_2 Emissions: What If Only OECD Goes Net Zero by 2050?



Even if **entire OECD goes net zero** by 2050, ...

... **without non-OECD**, global CO_2 emissions in 2050 will likely be **just 10% lower** than in 2020.

Energy Policy Research analysis based on EIA's International Energy Outlook (Oct 2021)

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