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Next Steps in U.S. and State Energy Portfolios

Dr. Stephen Bird, Director

Carsey Policy Hour
4/9/25

Agenda

- Plug for the Carsey School! http://unh.edu/603/carsey.

- Framing the Energy Transition & Setting the Context
- State of Play
  - National Expectations for energy
  - Implications for NH (and other states)
- Long-term Expectations and the Global Situation

What is the Energy Transition?

- a major structural change to energy supply and consumption in an energy system > currently a renewable energy transition

- Controversy:
  Policy change creates winners and losers

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Take Action Approach

(Limit Warming to 1.5-2˚C)
Costs of $16-103 Trillion

Do-Nothing Approach

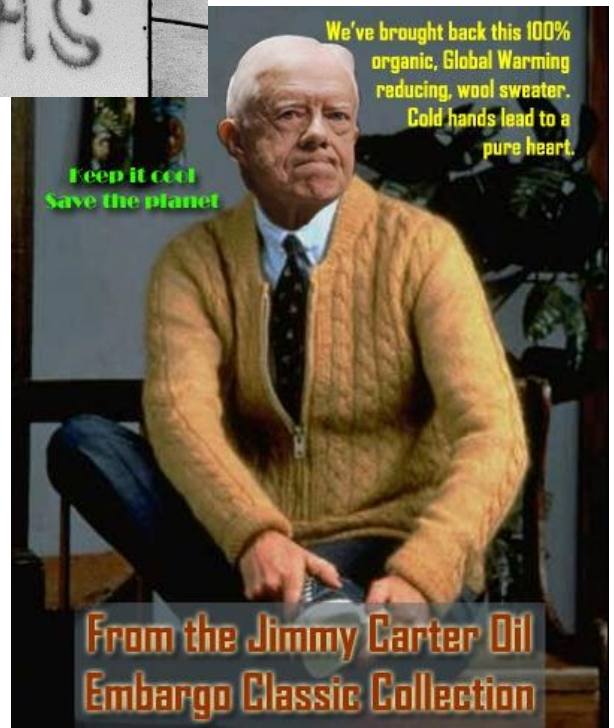
(Failure to limit to 1.5-2˚C)
Costs of $150-792 Trillion

Nature Communications volume 11, Article number: 1624 (2020)

The beginning (?) of US energy policy and this transition

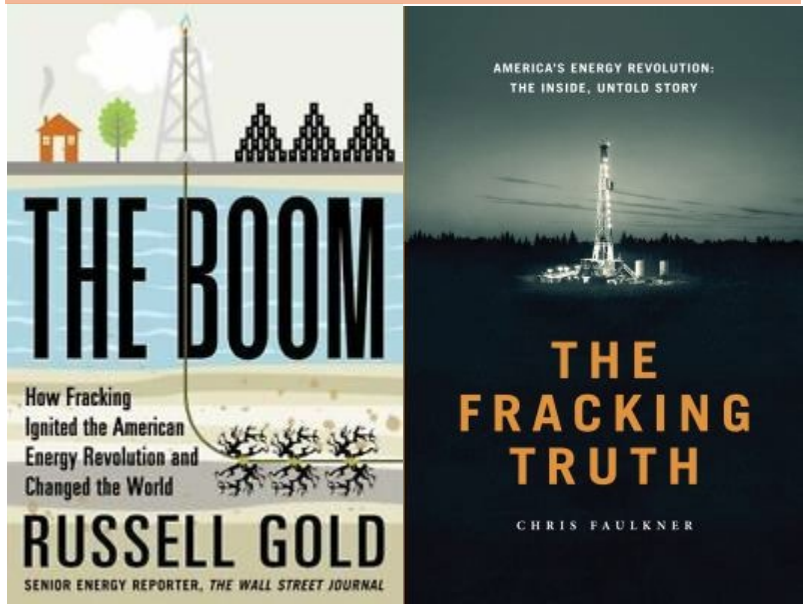
"Energy conservation is the moral equivalent of war."

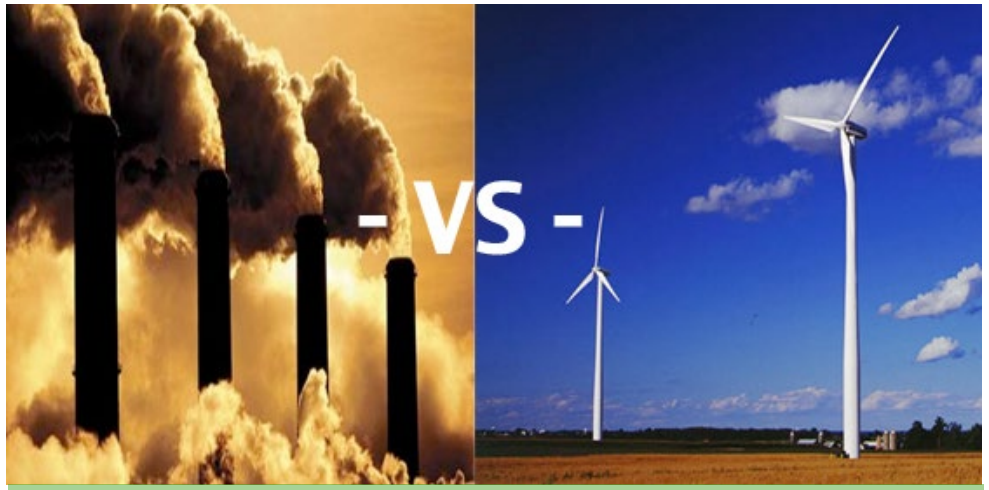
- President Jimmy Carter, 1977 in Response to OPEC's Oil Embargo
- America experiencing unheard of gas lines, energy shortages, and escalating energy prices



2 revolutions for an energy superpower

2006: Fracking emerges as massive game-changer



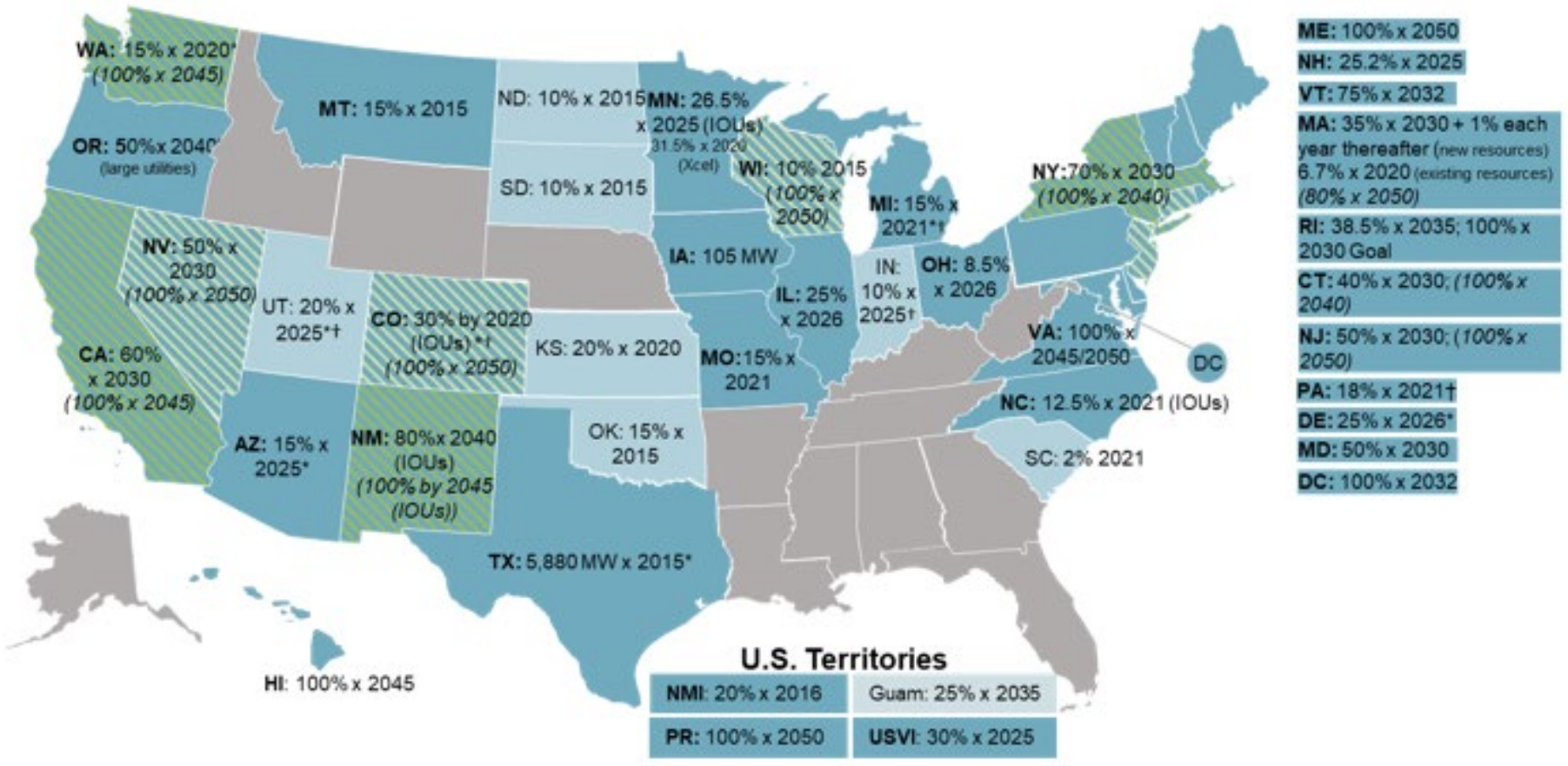


2019: Renewables consumption surpasses coal in U.S.

"The Energy Transition"

Energy Conflict, Land Rights, Energy Politics & Polarization

Energy Regionalism, Energy superpower, & Role of the States



- ~75% of US pop. in an RPS
- > 20 states have some sort of carbon policy

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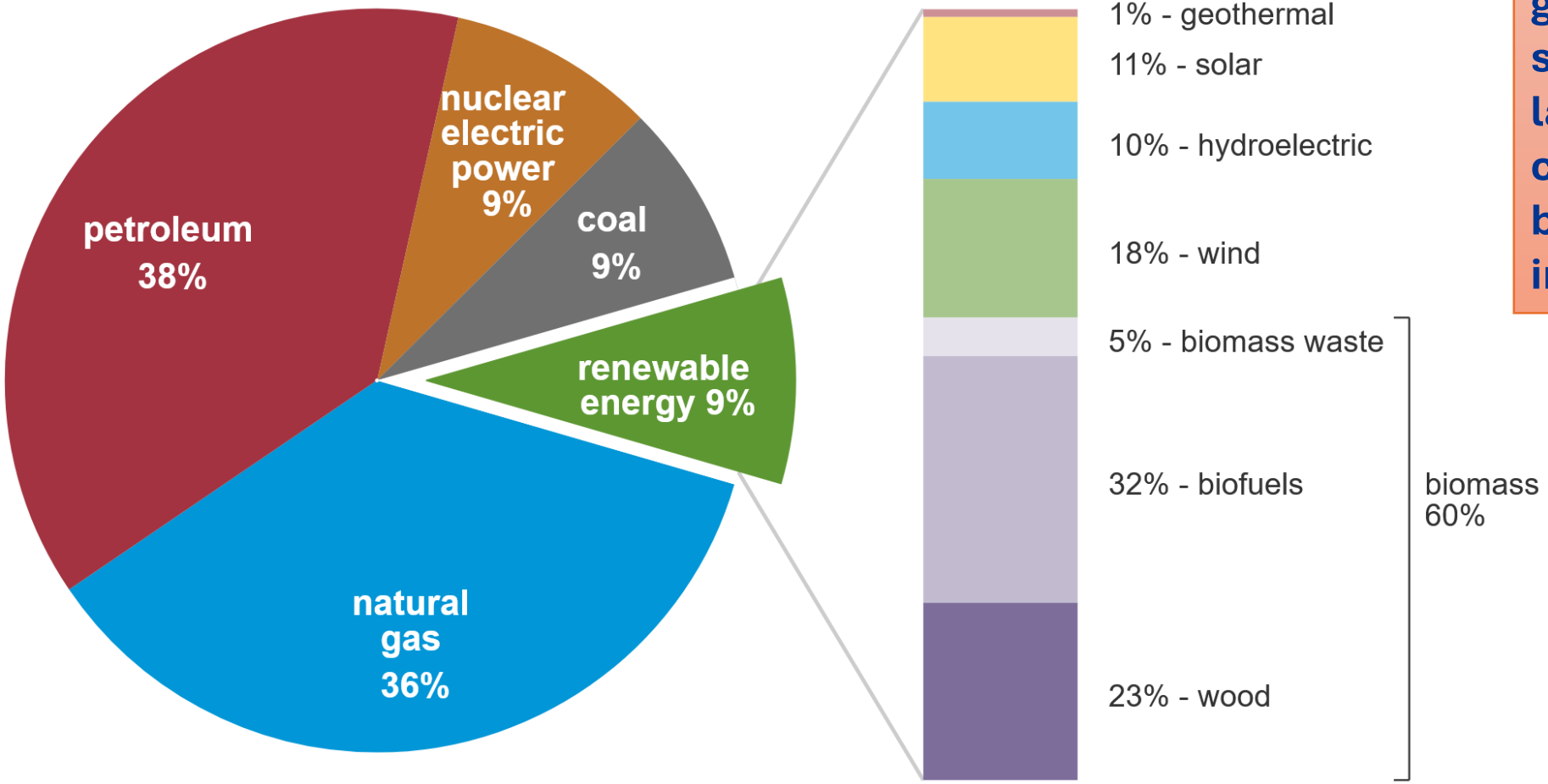
U.S. primary energy consumption by energy source, 2023

total = 93.59 quadrillion British thermal units

total = 8.24 quadrillion British thermal units



The US installed 50 gigawatts (GW) of new solar capacity in 2024, the largest single year of new capacity added to the grid by any energy technology in over two decades

Data source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 1.3 and 10.1, April 2024, preliminary data

Note: Sum of components may not equal 100% because of independent rounding.

New Hampshire energy snapshot differences

59% of NH households use petroleum products for primary heating

- 2nd largest share of all 50 states
- Wood as a primary heat for 1 in 16 NH households, 5x national average.

Seabrook nuclear 56% of 2023 generation & 18% from renewables

- Including small-scale solar. Most is hydro, biomass, and wind.

New Hampshire has the two remaining coal-fired power plants

- Retirements: Schiller 2025 (Portsmouth), Merrimack 2028 (Bow)

State of Play

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Trump Energy Agenda: Drill Baby Drill

Adoption of regulations to encourage oil and gas

- Adoption of generous subsidies for nuclear, CCUS

Comprehensive Env. Deregulation

- vehicle & power plant emission standards
- 2009 endangerment finding for regulation of GHGs
- Elimination of any equity-based policy:
  - environmental justice, low-income energy programs, energy efficiency, etc.

10-25% tariffs on energy, energy materials (supply chain)

https://enerknol.com/visual-primer-president-trumps-executive-orders-reshape-u-s-energy-and-environmental-policies/.

Likely IRA Repeal

The Inflation Reduction Act (IRA) an economic engine:

- 400,000 new jobs; $600 billion of private investment in clean energy
  - Carsey School's Ctr for Impact Finance Role in finance education
- Cost of Repeal?*
  - cumulative household energy costs by $32 billion from 2025-2035.
  - 2035: Job losses 1.4 million, GDP loss $190 b., & CO2e + 530 mill. tons
- Continued support for geothermal, new nuclear, O&G,

* https://energyinnovation.org/report/inflation-reduction-act-repeal-harms-state-economies-raises-consumer-costs/.

New Hampshire

- IRA & Infrastructure subsidies OK so far: NH had 250 million for home weatherization, EV infrastructure, solar etc.

- So far, DES programs in solar, energy efficiency, are still in place
  - Situation could change with NH budget negotiations (June resolution)or by loss of federal funding

- Loss or reductions of LIHEAP (Low-income heating assistance program) will affect NH low-income residents, esp. North Country

- Expect increases in cost of energy, though oil and gas costs may stay moderate in first year or so.
  - A great deal depends on degree of supply chain impact in energy sector

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New Hampshire

- NH loss of interest dividend tax creates enormous pressure to fix budget holes.

- More extreme legislation seems not to be moving forward in NH.
  - Net Energy Metering improving
  - Passed PACE property assessed clean energy option for commercial buildings
  - Slight weakening Renewable portfolio standard
  - Proposals to weaken renewable energy fund

- EV charging infrastructure and its relationship to the tourist industry

Thanks to Clean Energy New Hampshire for Legislative Analysis

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Canada, another energy superpower

- Canada US energy Trade: ~ $100 B / yr (overall trade @ $700b+)
  - Oil, gas, electricity (hydro), petroleum products, energy supply chain

- NEISO (New England grid operator) estimates the 10-25% tariff on Canadian electricity could total $66 - 165 million / yr in New England alone

The Global Context (and why it matters so much for US)

Global Context

- 2024: Global energy demand grew by 2.2%, Elec. Up 4.3%
  - Shares in increase: *Renewables (38%),* natural gas (28%), coal (15%), oil (11%) and nuclear (8%).

- Emerging and developing economies: 80% of growth
  - China & India

- Oil demand growth slowed markedly in 2024, in line with the IEA's forecast.
  - *Oil's share of total energy demand fell below 30% for the first time ever*, 50 years after peaking at 46%

https://www.energyinst.org/exploring-energy/resources/news-centre/media-releases/a-year-of-record-highs-in-an-energy-hungry-world,-reveals-ei-statistical-review.

Tipping Points

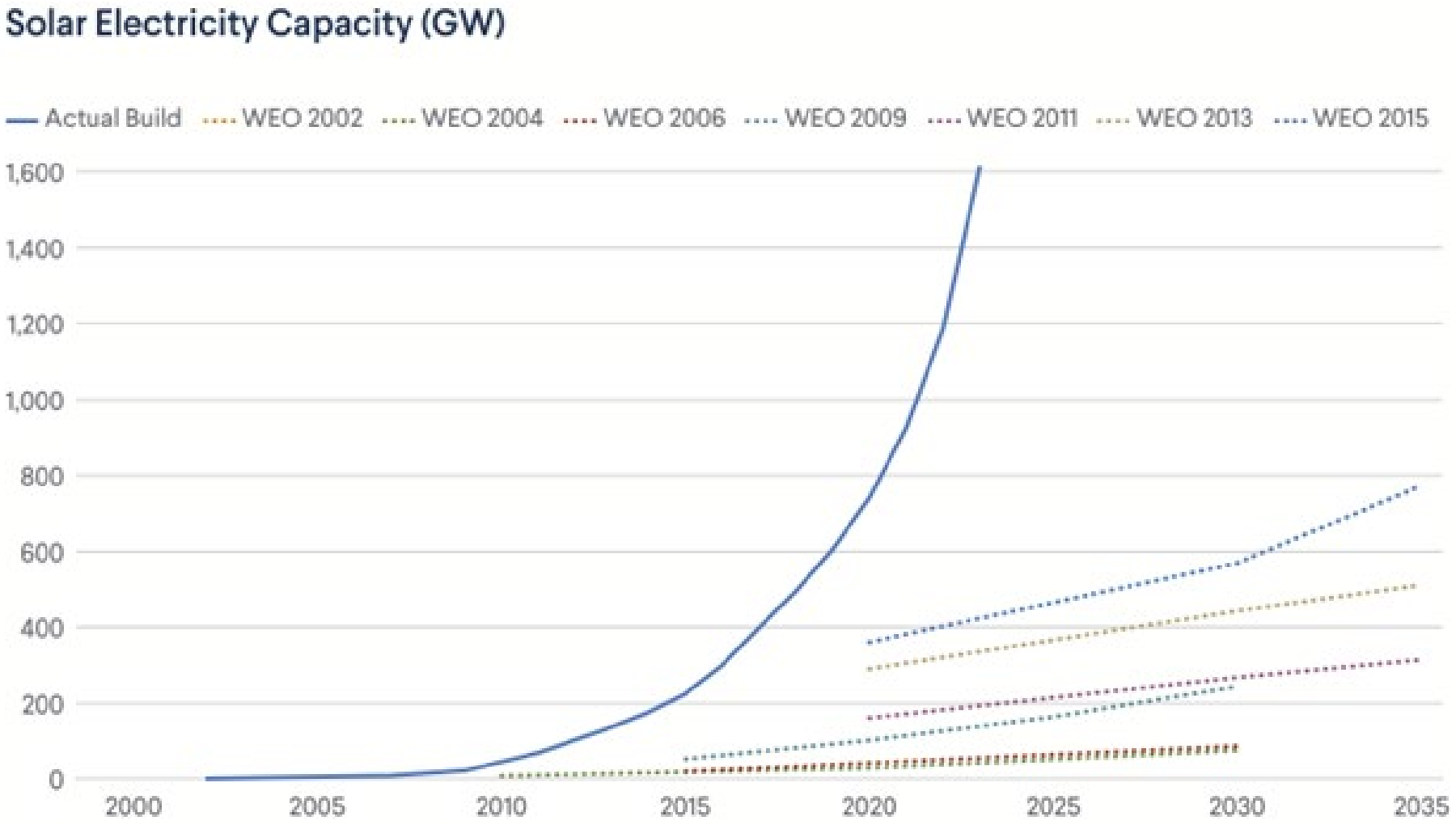
- Tipping Points
- Experience Curve
- Scaling up

The US installed 50 gigawatts (GW) of new solar capacity in 2024, the largest single year of new capacity added to the grid by any energy technology in over two decades

https://www.bloomberg.com/graphics/2022-clean-energy-electric-cars-tipping-points/

"The way we produce and use electricity is undergoing a series of simultaneous transformations that will ultimately determine the scale of climate change. These various technologies collectively make up their own sort of early-stage tipping point for building a climate-safe energy system. The date by which the world will successfully cross that threshold is the biggest question that remains."

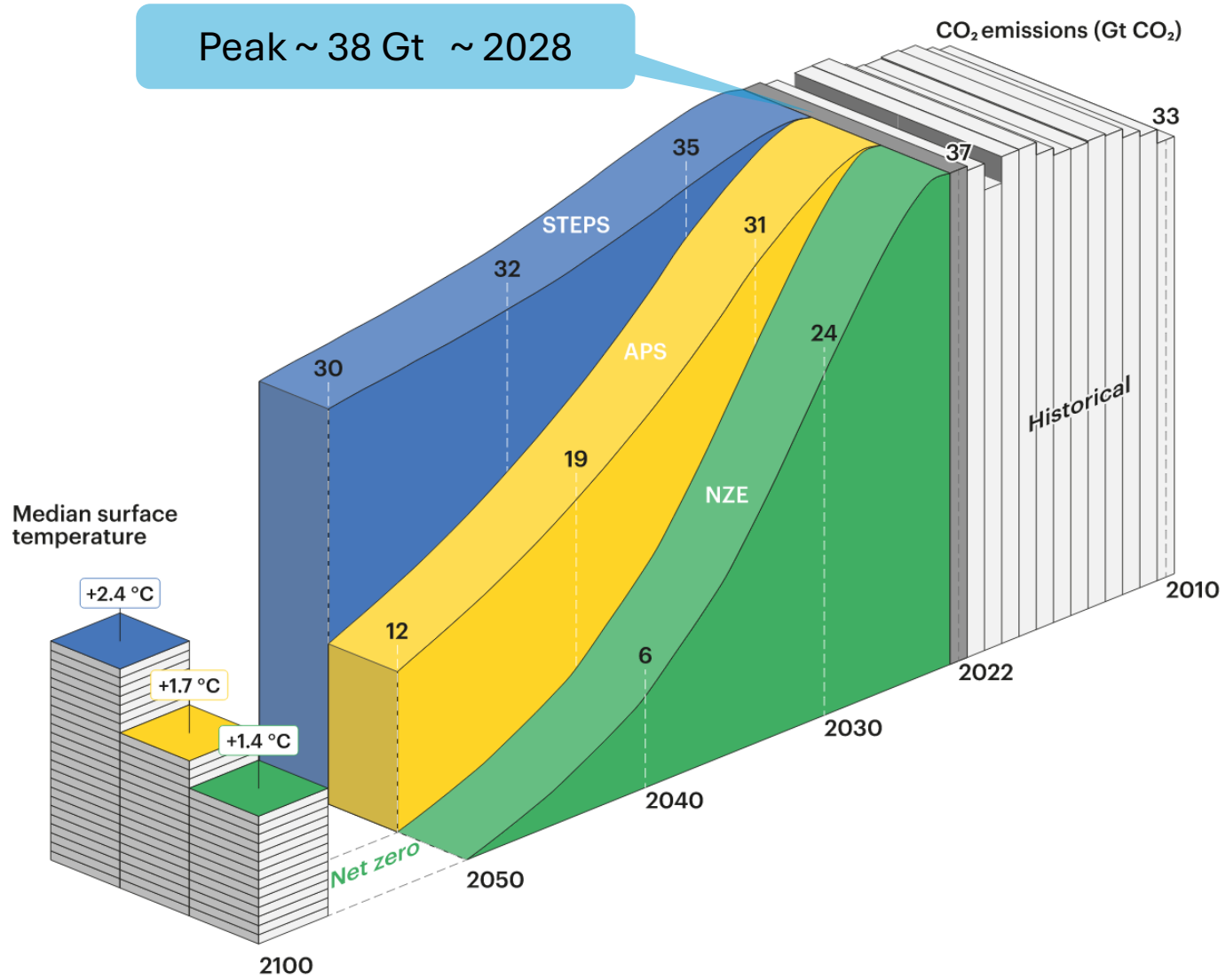
Solar Growth compared to IEA predictions



David Hart, Council on Foreign Relations, https://nationalinterest.org/blog/energy-world/in-the-line-of-fire-the-iea-is-right-where-it-should-be.

COUNCIL on FOREIGN RELATIONS

World Energy Outlook – “good news”



Int’l Energy Agency 2023 - Oct. 23

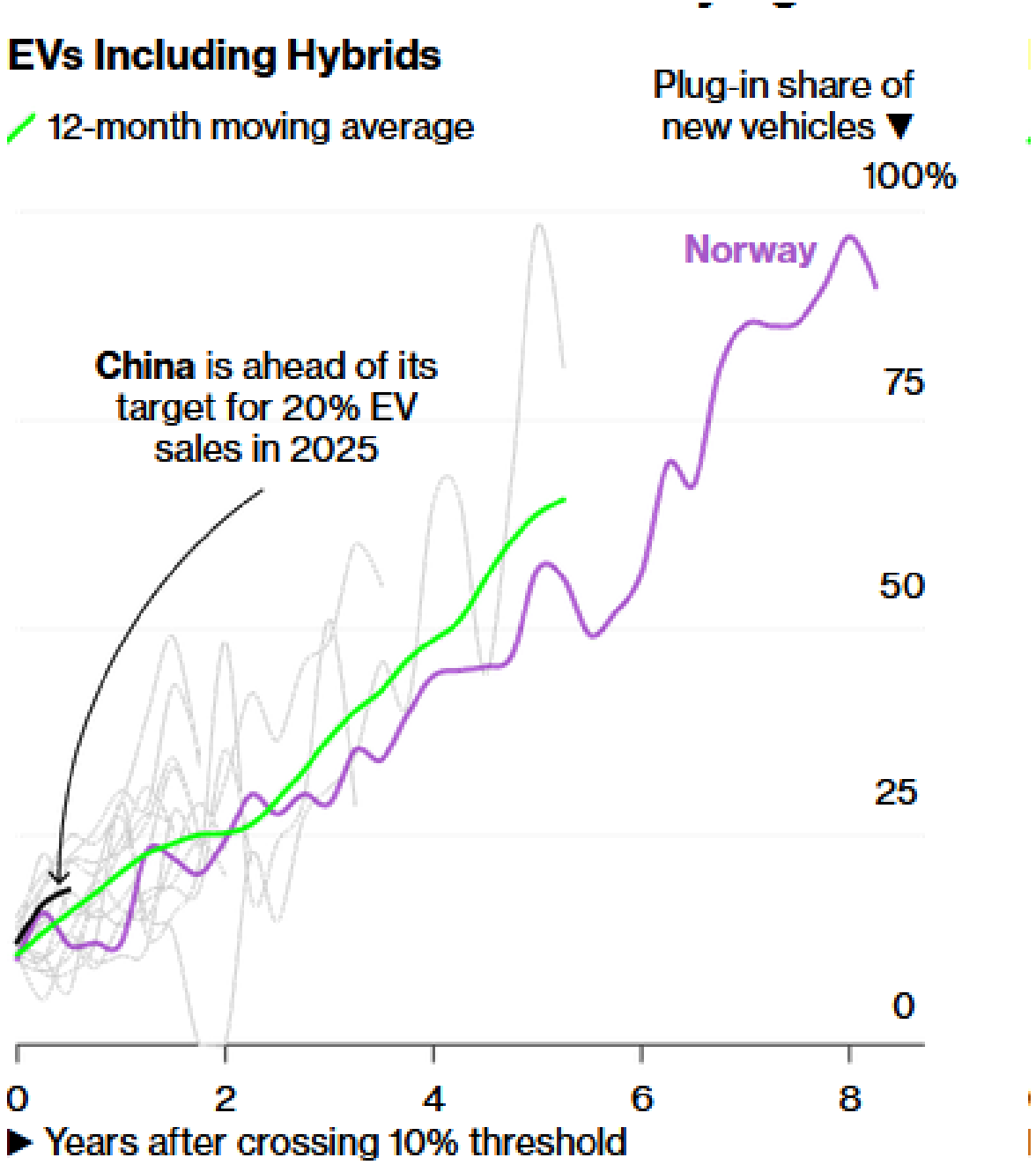
STEPS – Stated Policies Scenario

APS – Announced Pledges Scenario

NZE – New Zero Emissions (2050)

https://www.iea.org/reports/world-energy-outlook-2023/

EV Tipping Points



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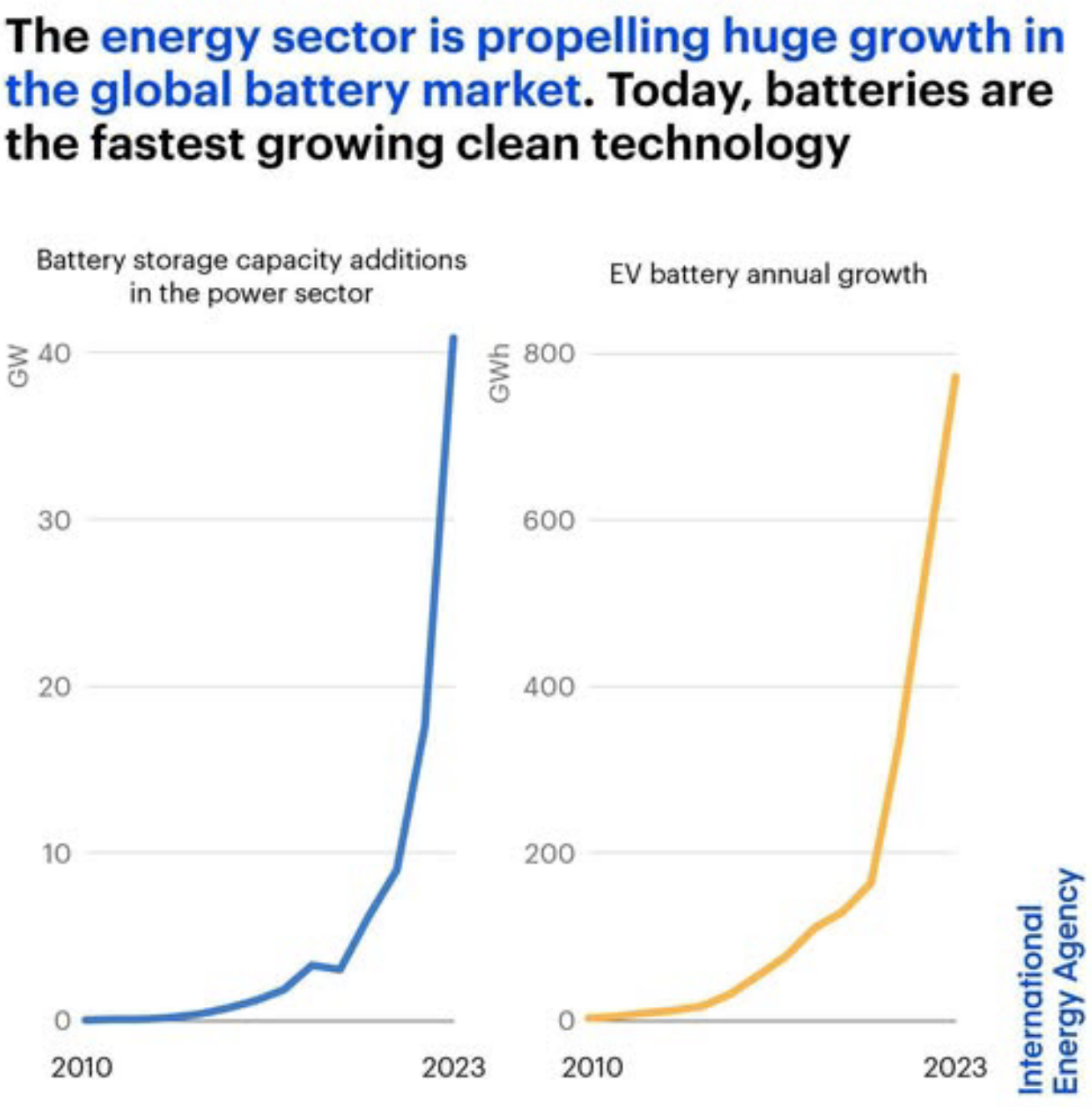
Energy Storage



- Storage is the “holy grail” of renewables
- And btw, we have some of the best storage in the world in the US and Canada: Hydro Dams

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Key Takeaways

- Transition will be slowed in US, possibly considerably, but market and global competition forces have momentum (scale & cost)
  - Will extend scope and length of fossil fuel market share in US
- Significant costs & concerns for impact of tariffs on economy, and energy industry broadly – including for fossil fuels; For NH and New England, some particularly painful effects likely
- States, Regions, & Cities will lead energy transition next 4 years
- Loss of leadership & market competitiveness for US in energy space
- Global instability likely to simultaneously provoke increases in clean energy transition growth, with short term dependence on fossil fuels

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