



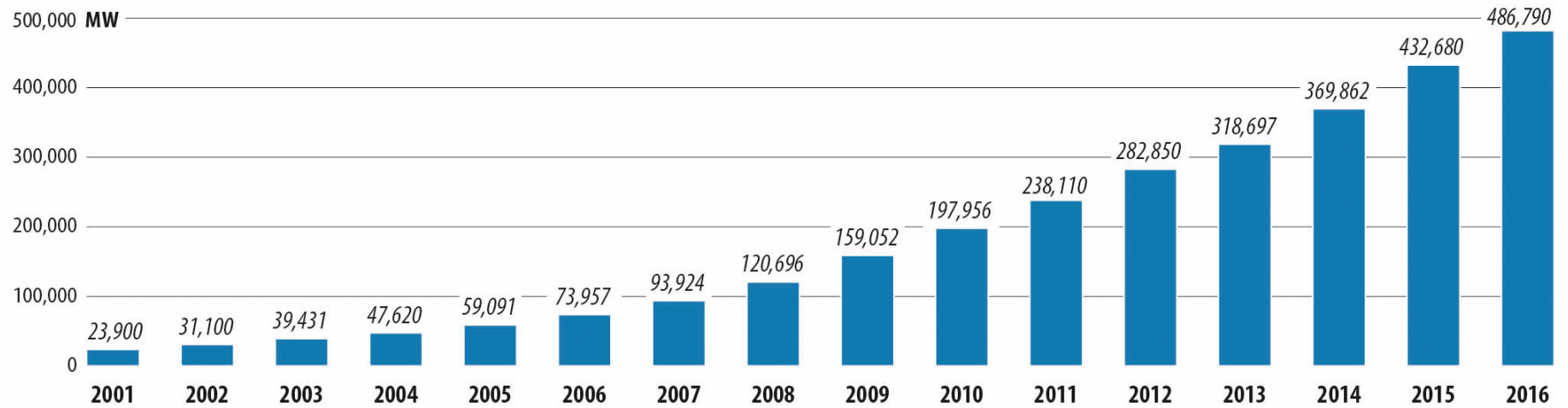
COLUMBIA LAW SCHOOL

SABIN CENTER FOR CLIMATE CHANGE LAW

Offshore Wind in New York In Global Context

Michael B. Gerrard
September 18, 2017

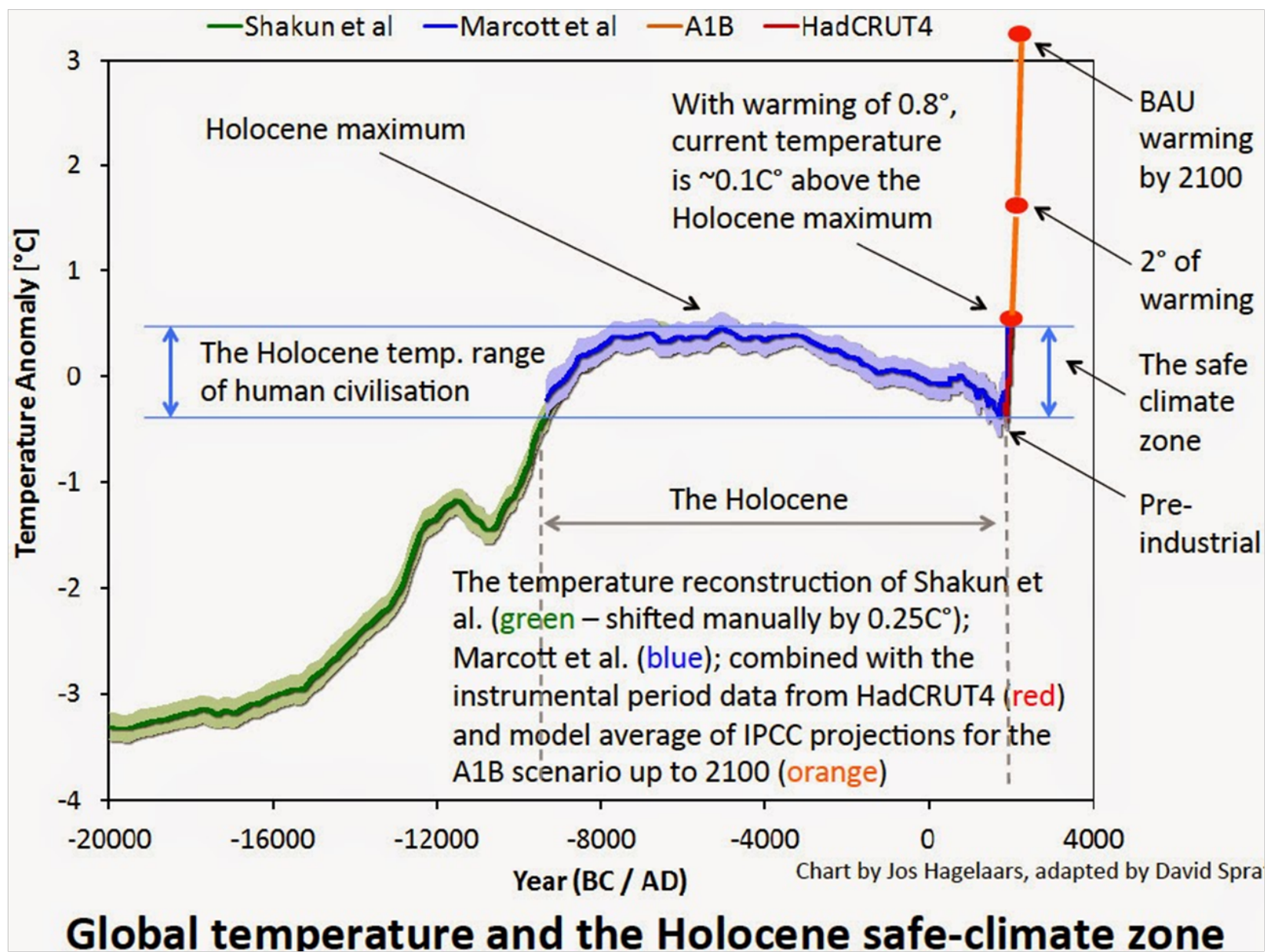
GLOBAL CUMULATIVE INSTALLED WIND CAPACITY 2001-2016

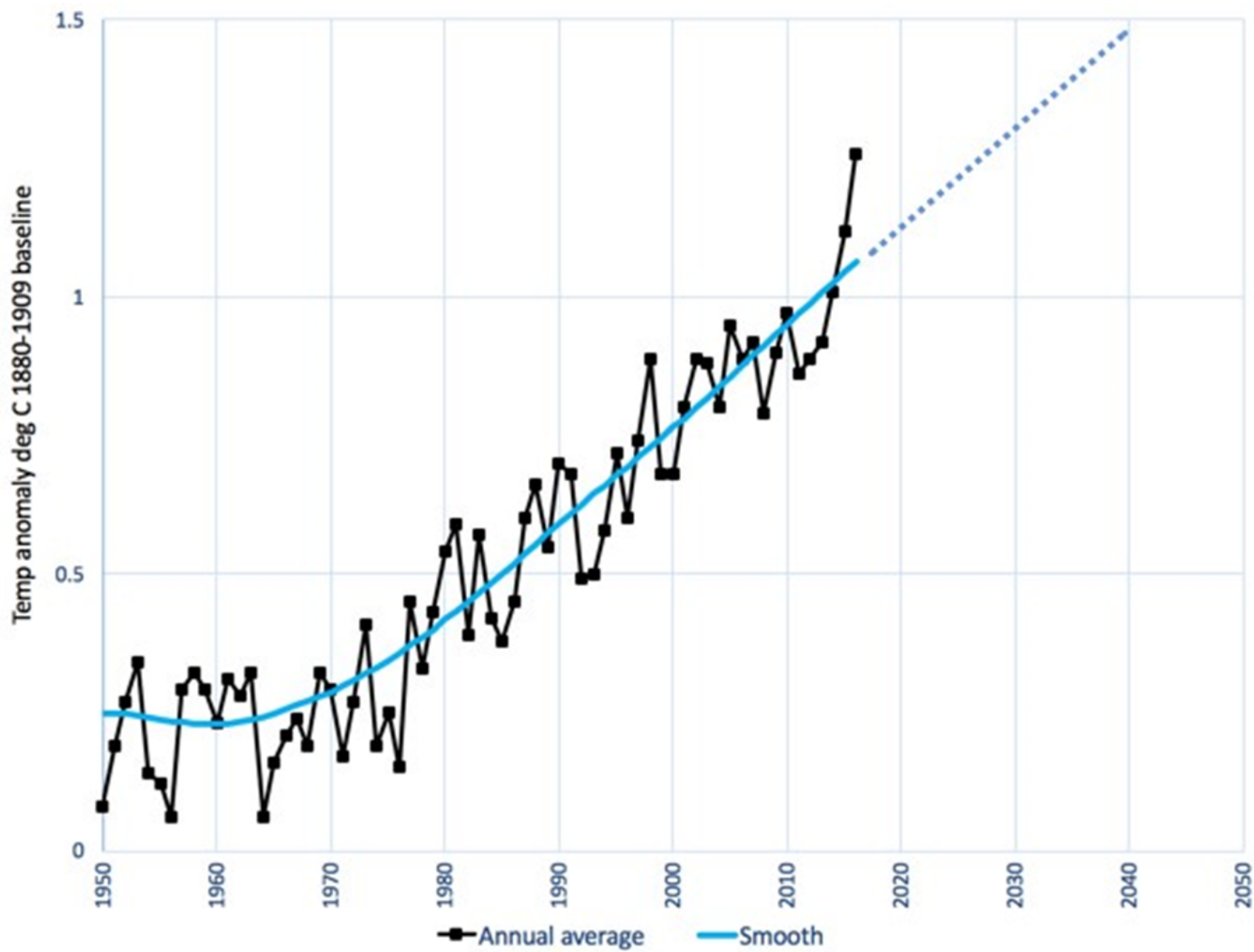


Source: GWEC

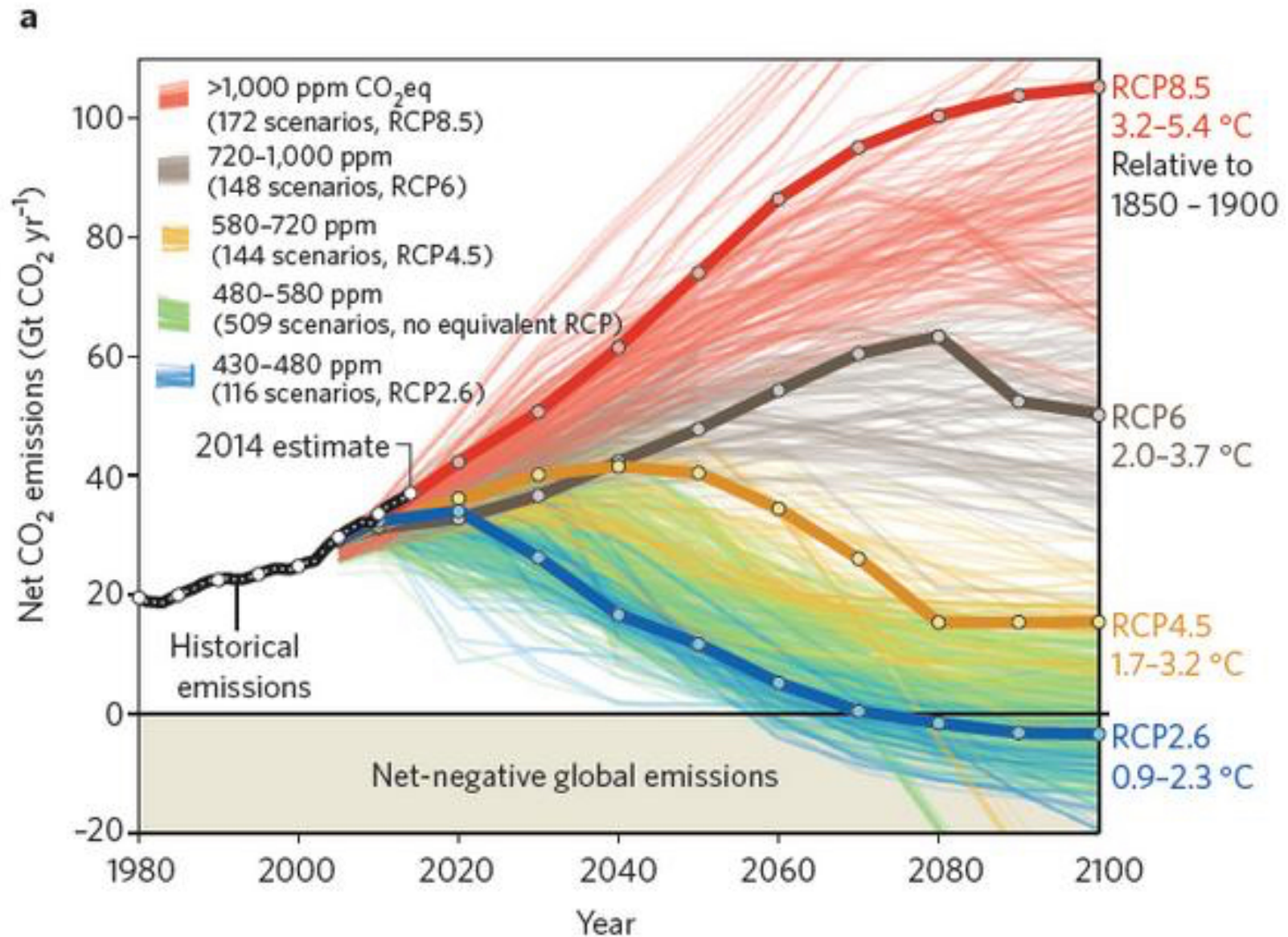
Offshore wind capacity (2016), MW

5,156	United Kingdom
4,108	Germany
1,627	China
1,271	Denmark
1,118	Netherlands
712	Belgium
202	Sweden
60	Japan
35	South Korea
32	Finland
30	United States
25	Ireland
5	Spain
2	Norway





Greenhouse gas/temperature scenarios



U.S. Pledge to Paris Conference

U.S. EMISSIONS UNDER 2020 AND 2025 TARGETS

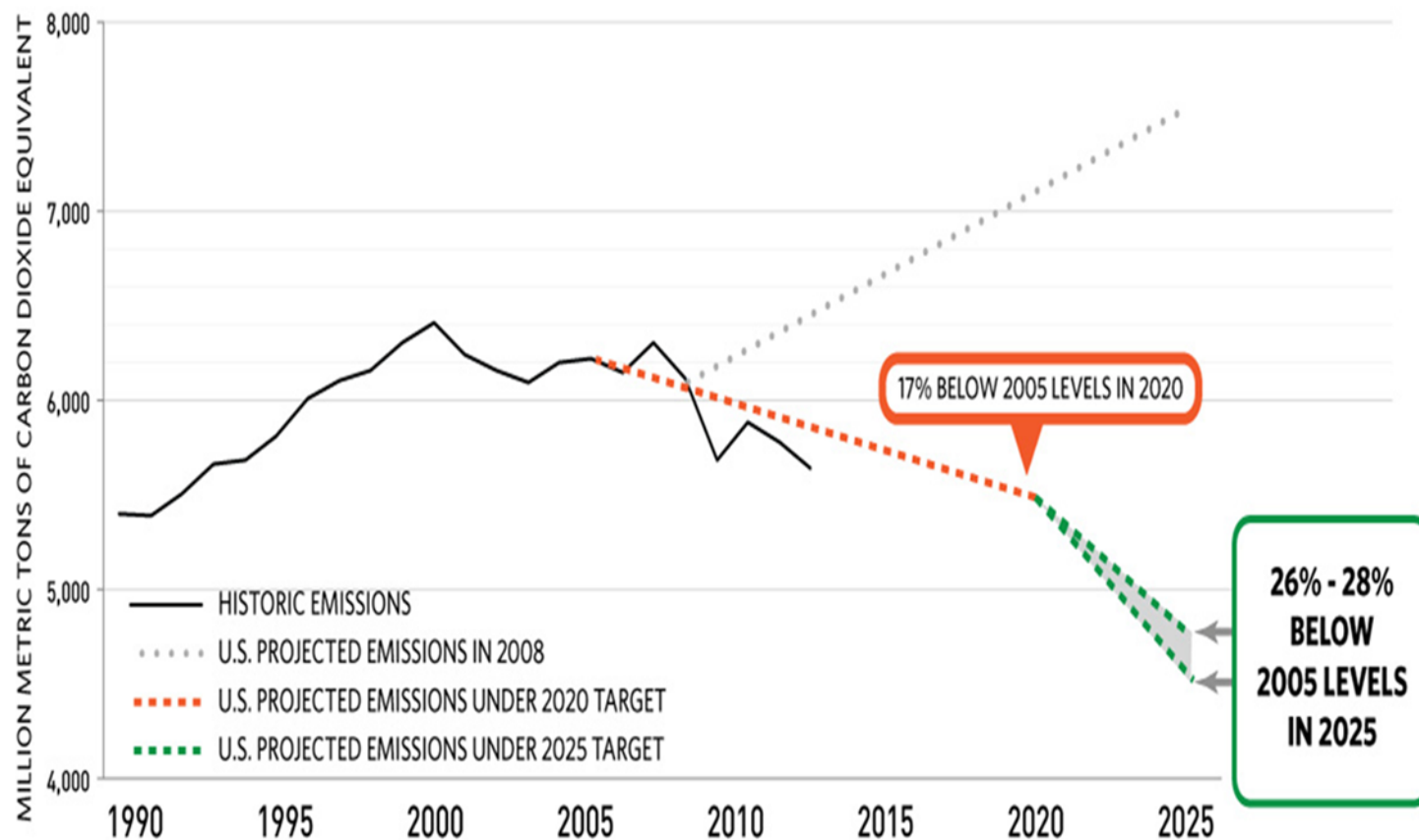
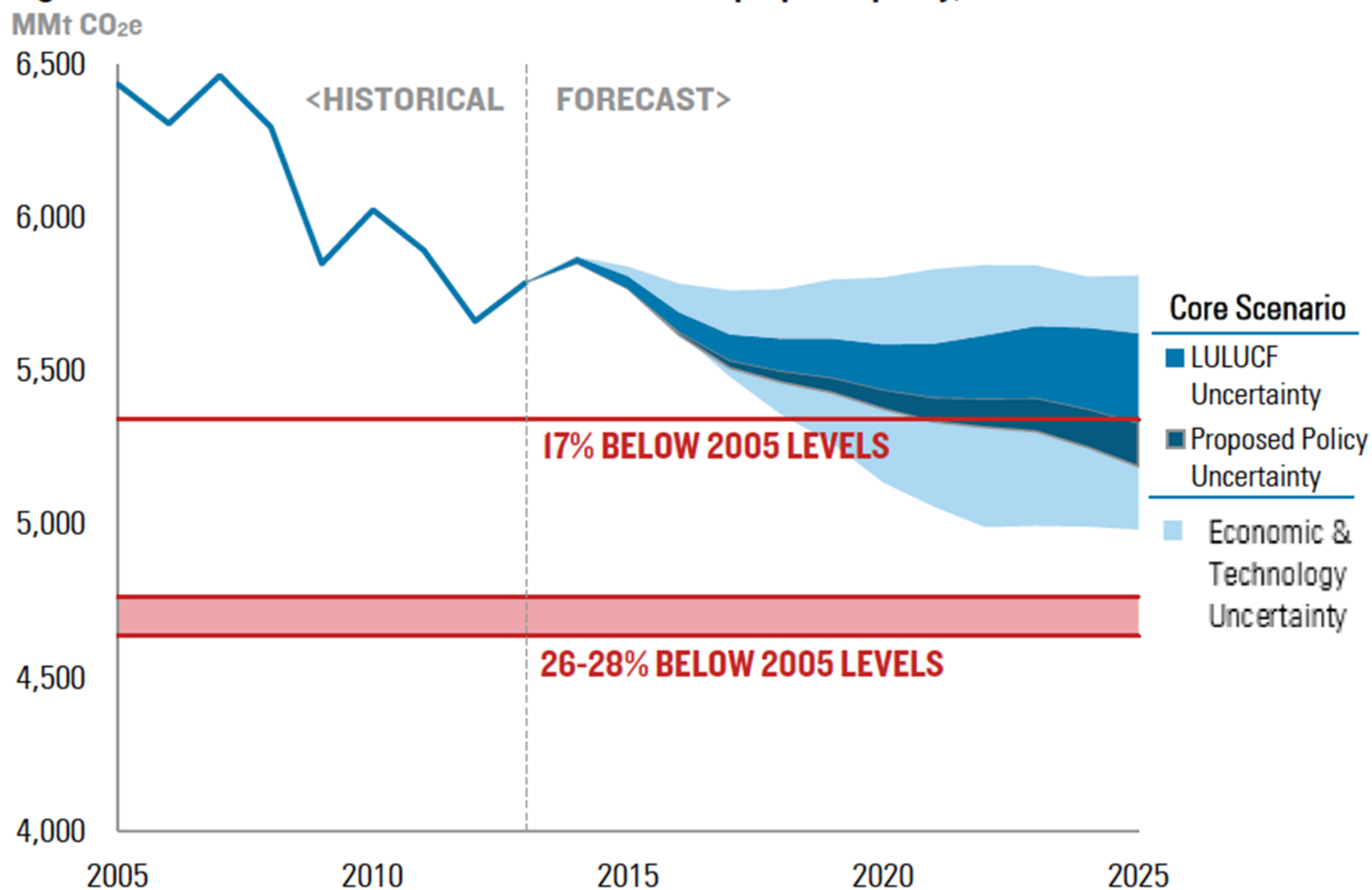


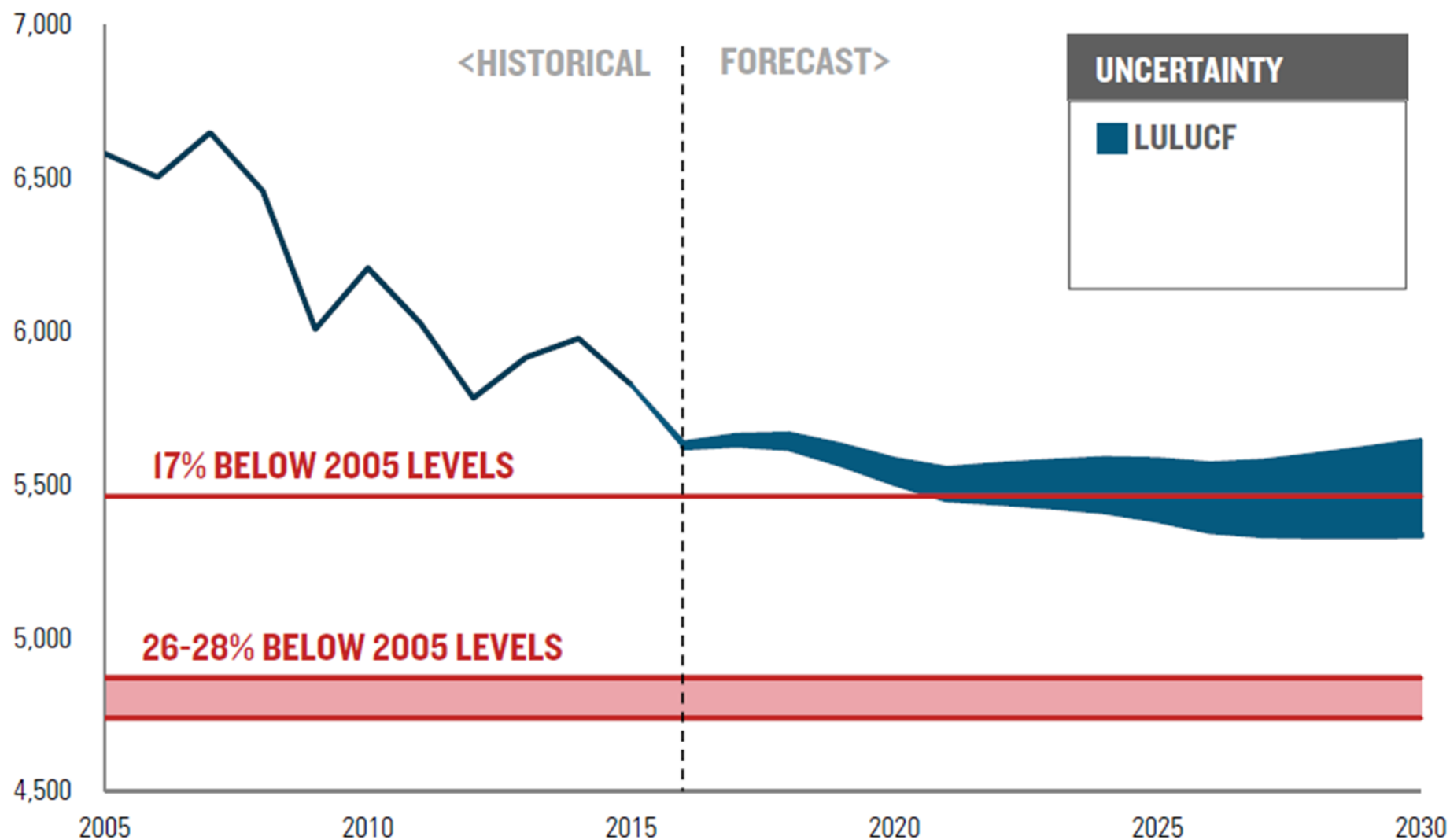
Figure 10: US net GHG emissions under current and proposed policy, 2005-2025



Source: EPA, US Second Biennial Report, Rhodium Group analysis.

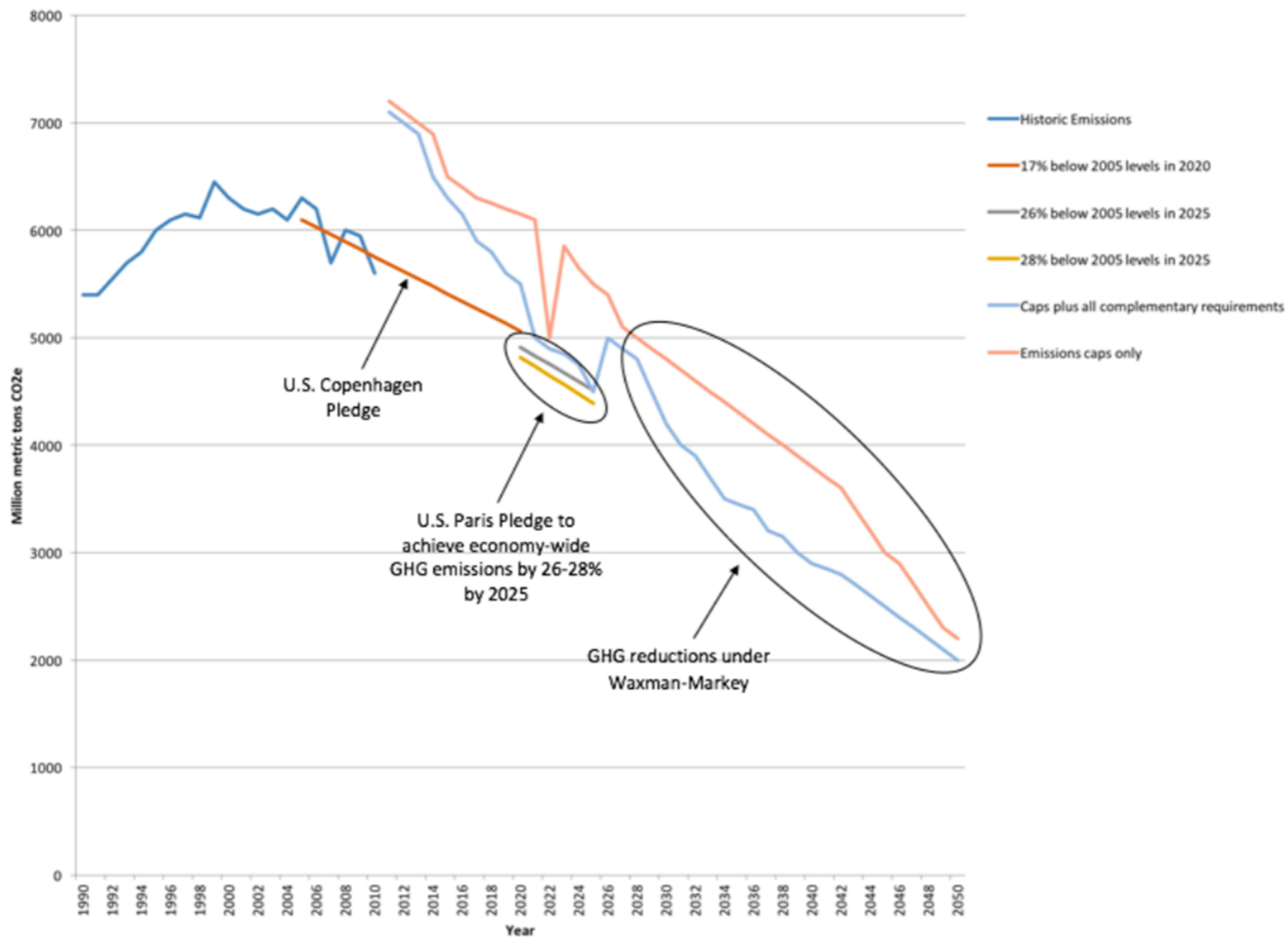
Figure 2: Net US GHG emissions under current policy

MMt CO_{2e}



Source: EPA, Rhodium Group analysis.

Intended Nationally Determined Contributions Compared with Waxman-Markey Caps





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OCTOBER 8, 2015 | Albany, NY

Governor Cuomo, Joined By Vice President Gore, Announces New Actions to Reduce Greenhouse Gas Emissions and Lead Nation on Climate Change

ENVIRONMENT

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Forecast Temperature Changes by 2100

Compared to Average Temps 1971-1999



Lower Emissions



Higher Emissions

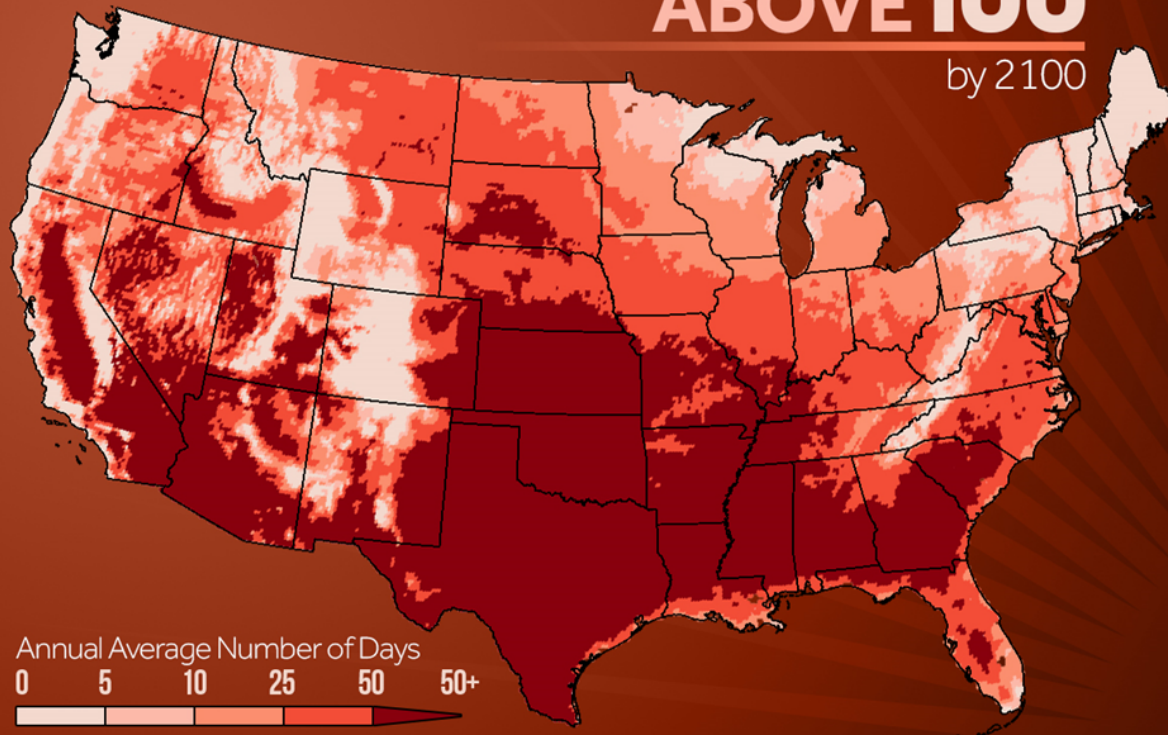
Temperature Increase (°F)



Source: National Climate Assessment 2014

CLIMATE  CENTRAL

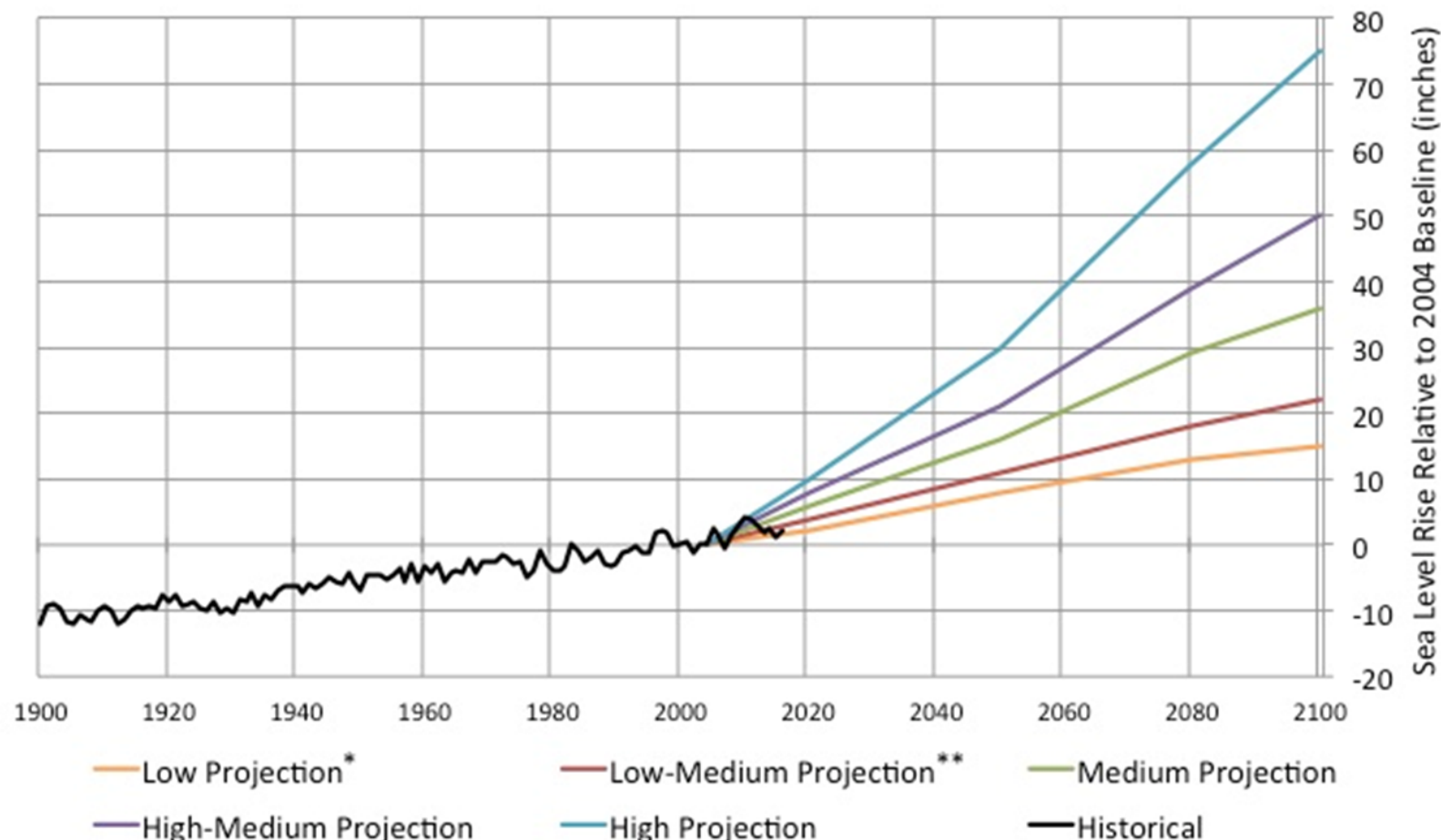
DAYS ABOVE 100° by 2100



Source: CMIP5 model projections of daily maximum temperature averaged over 20 year periods.

CLIMATE  CENTRAL

Official Sea Level Rise Projections for New York City

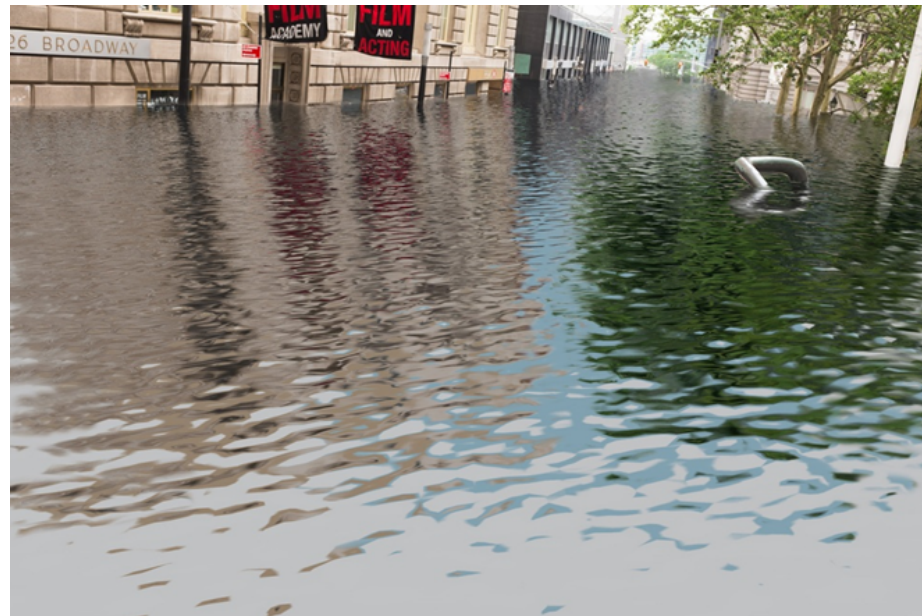


Graphics by Christian Termyn

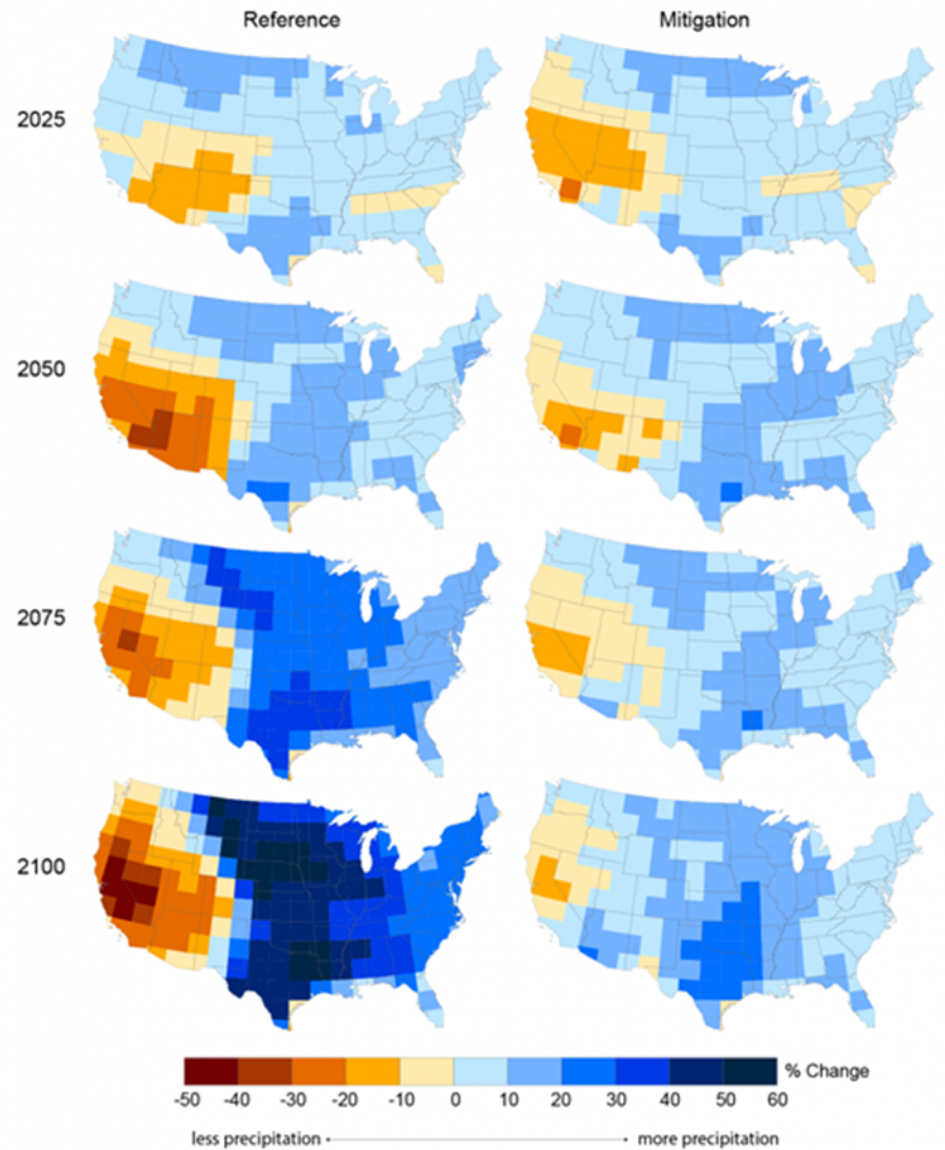
* Historical sea level rise sourced from Permanent Service for Mean Sea Level data for New York (the Battery), available at: <http://www.psmsl.org/data/obtaining/stations/12.php>

** NYS Sea Level Rise Projections, 6 NYCRR Part 490. Projections represent inches of rise over baseline level, which is defined as the average level of the surface of marine or tidal water over the years 2000 through 2004.

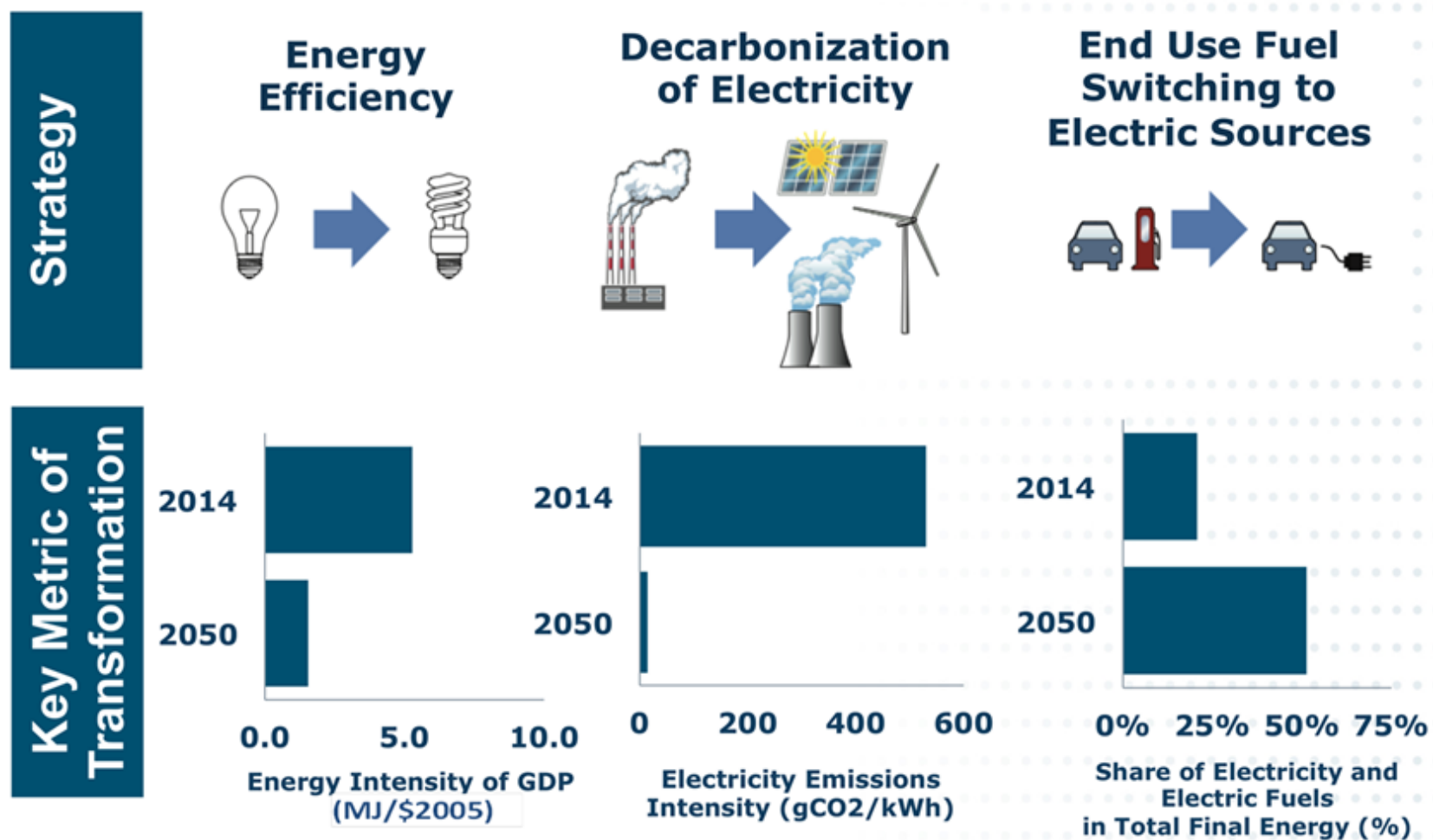
2°C v. 4°C simulation (Source: Climate Central)



Percentage Change in Annual Mean Precipitation With and Without Global GHG Mitigation

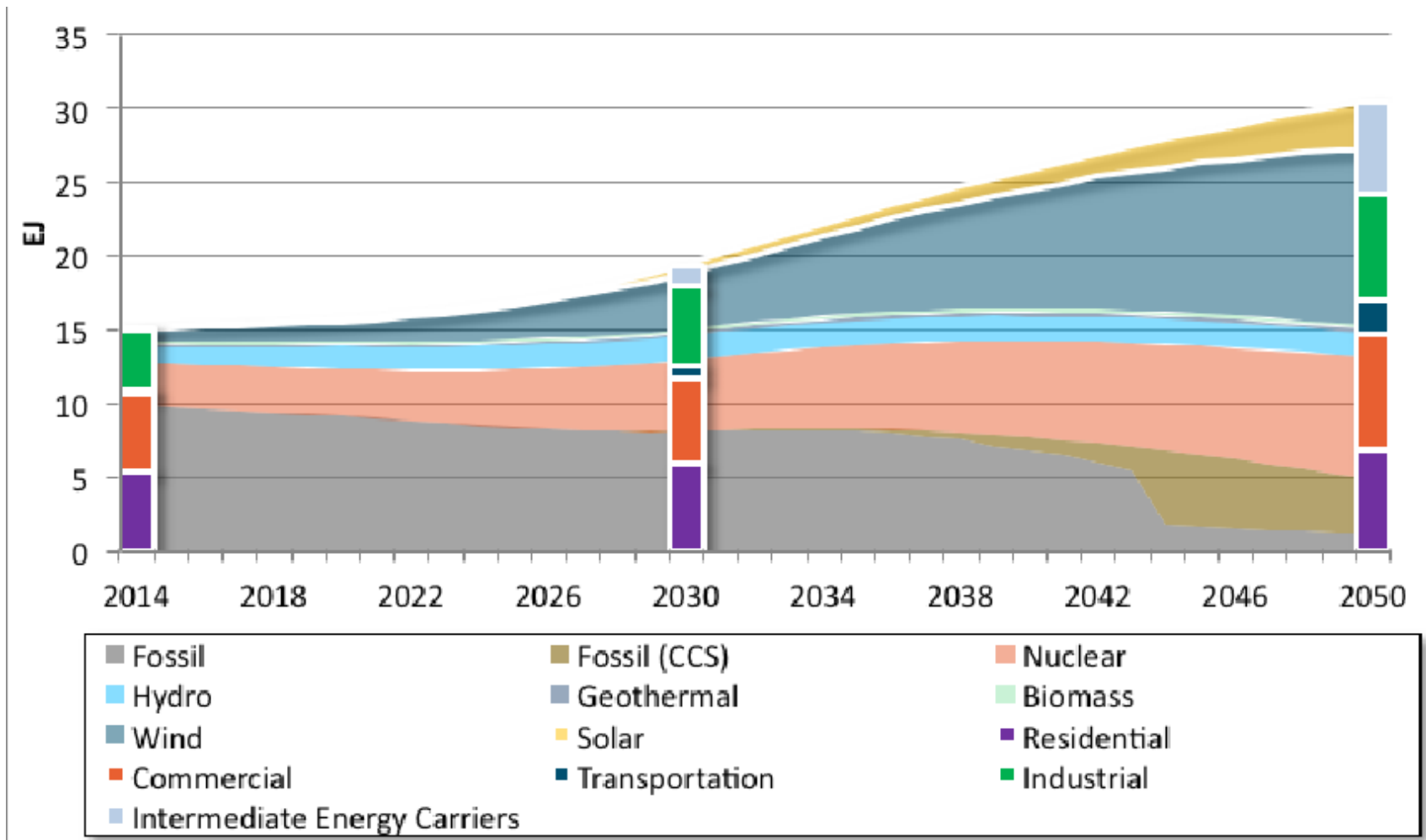


Three Pillars of Deep Decarbonization

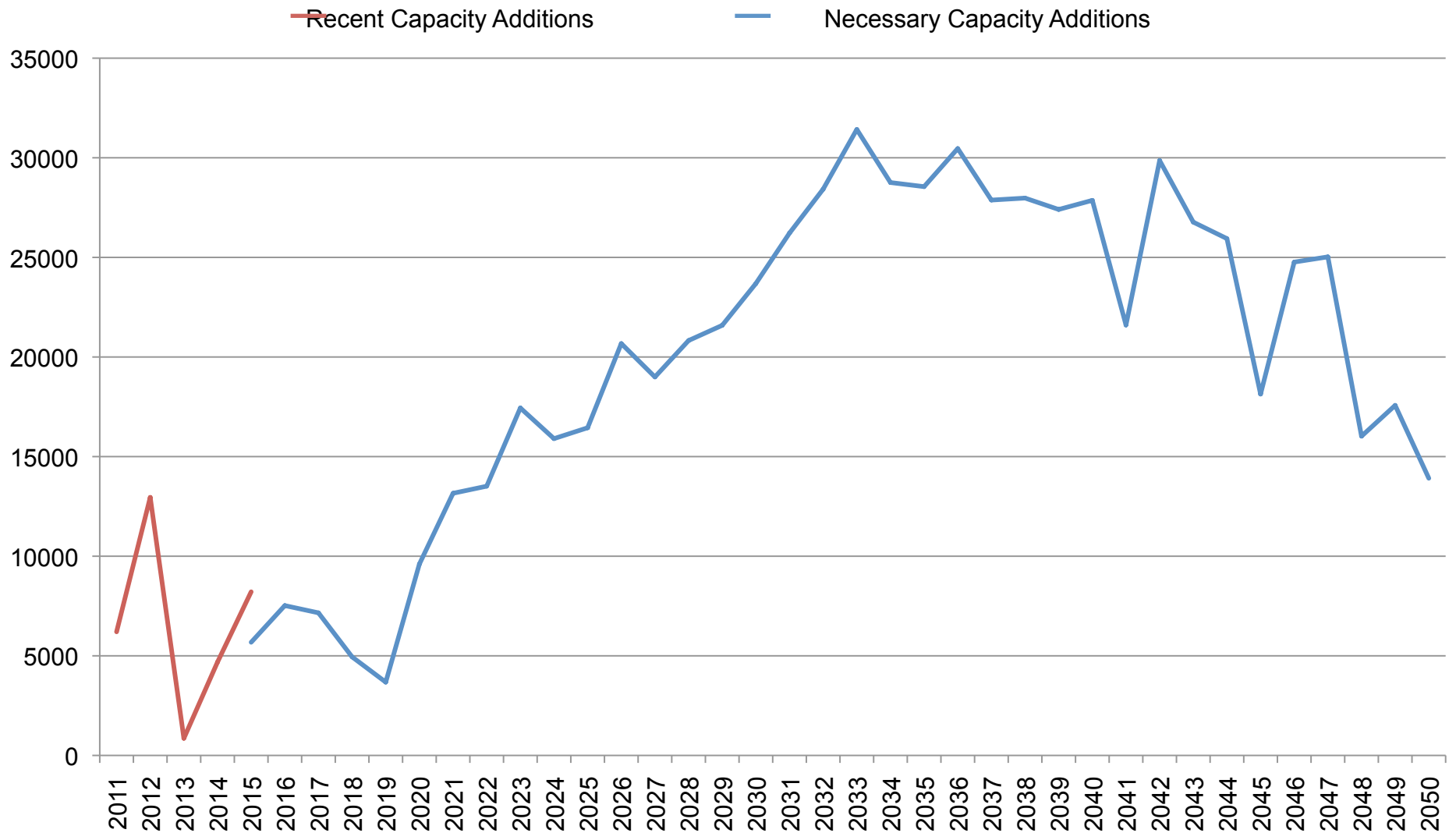


Pathways to Deep Decarbonization in the United States, Mixed case results

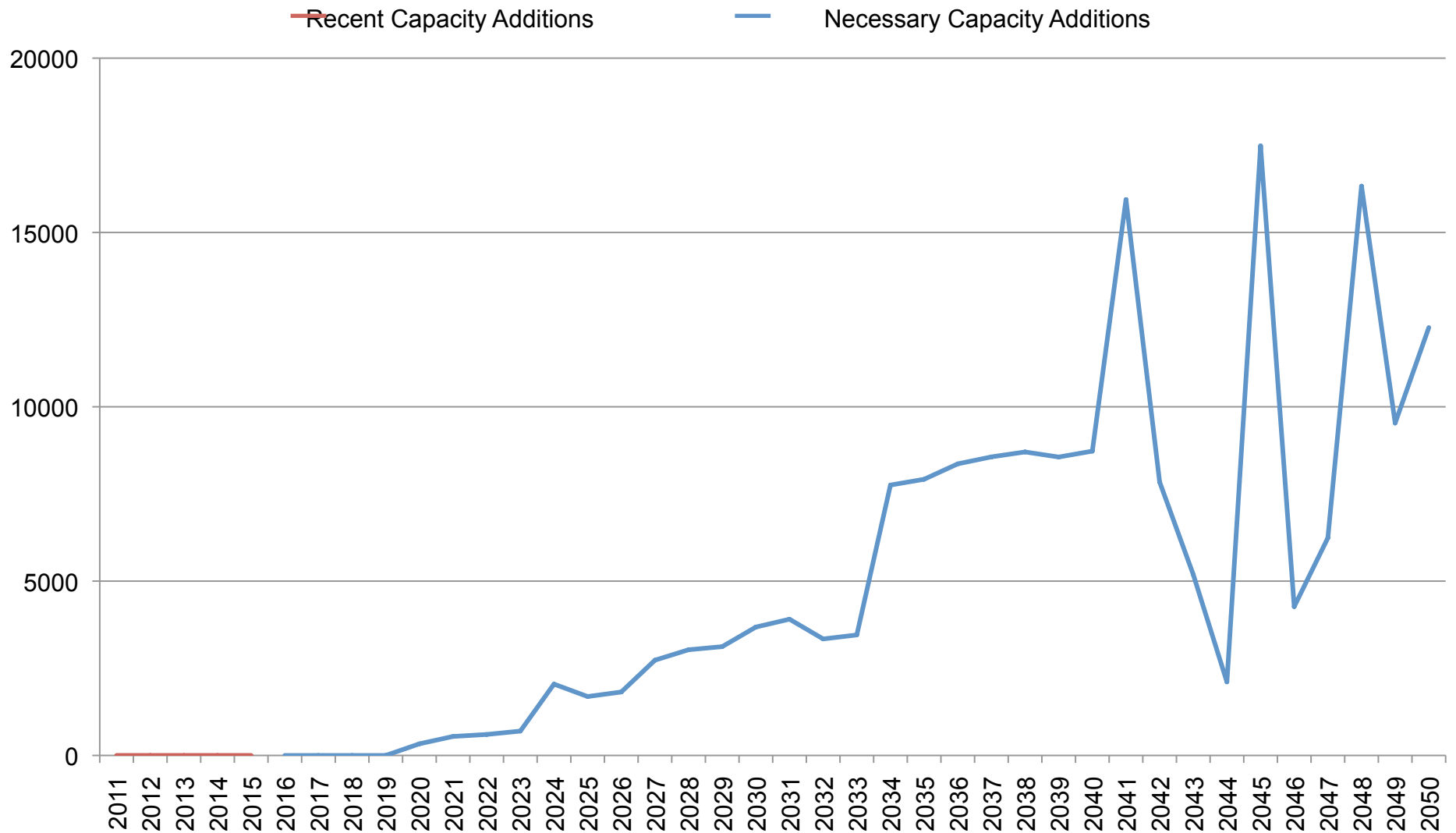
Electricity Supply and Demand (Mixed Case)



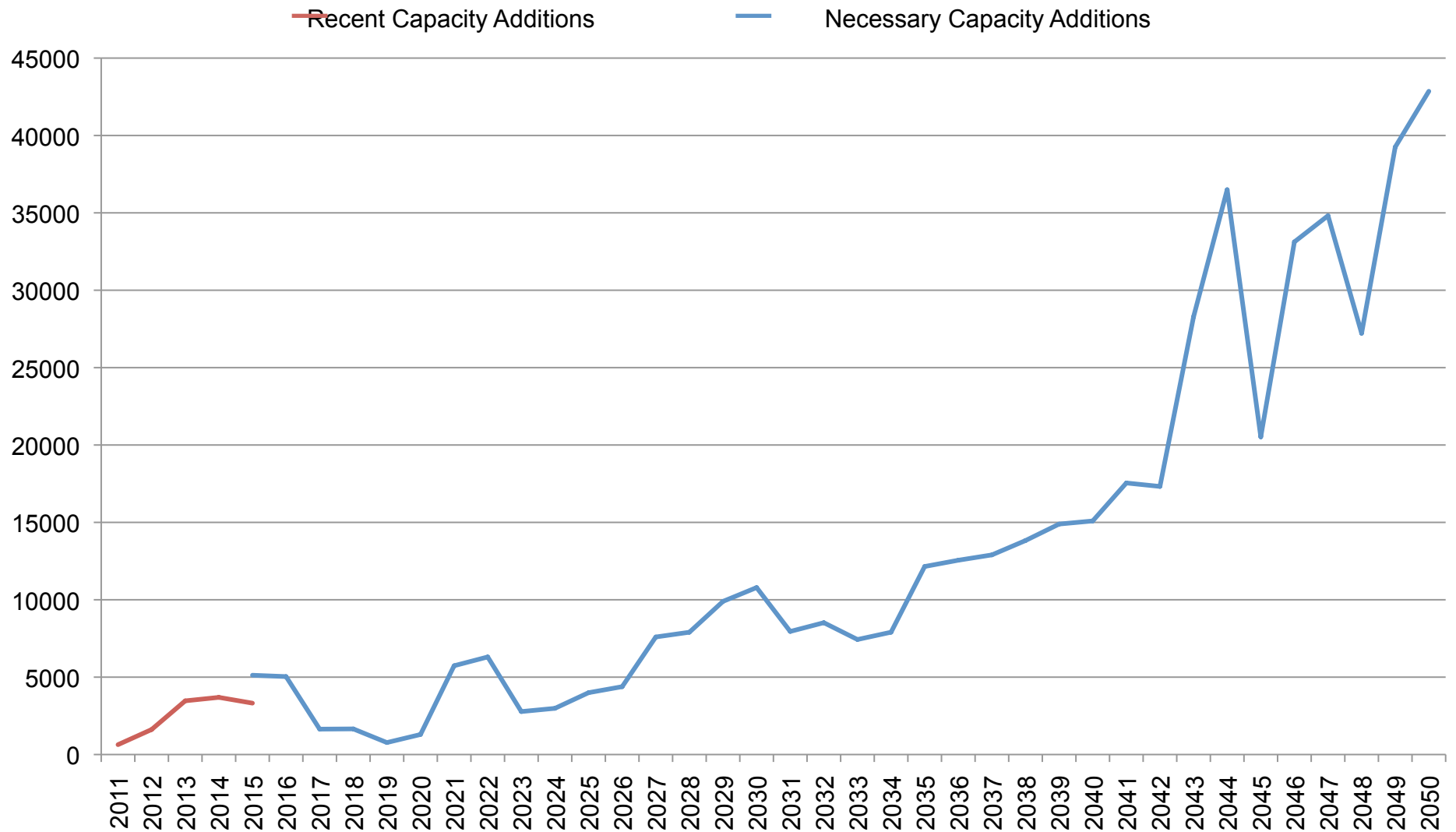
Onshore Wind



Offshore Wind



Solar PV



U.S. Electric Generating Capacity (MW)

Scenario	Offshore Wind	Onshore Wind	Solar PV
2016 Actual	30	81,260	19,380
2050: EIA AEO 2017 Reference Case	30,000	156,300	148,000
2050: DOE Wind Vision	86,000	318,000	—
2050: DDPP Mixed	186,802	725,382	488,539
2050: DDPP High Renewables	313,208	1,373,372	800,267

Cape Wind equivalents (468 MW) needed under Mixed Scenario for offshore wind

2025: 4/year

2035: 17/year

2045: 37/year