The Context for the Conversation: Thinking about the net impact of Offshore Wind . . .

Seth Kaplan

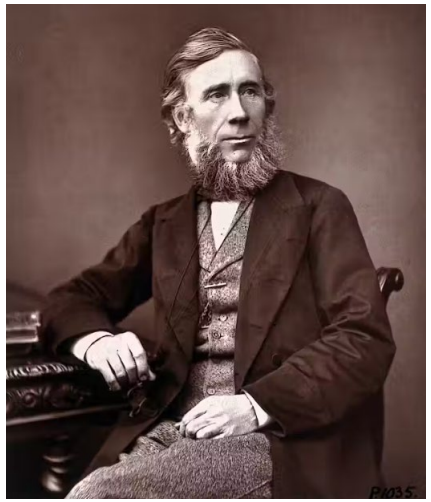
Director of Government and Regulatory Affairs

Ocean Winds NA

There are many important topics regarding potential impacts to many important species (including NARW) that deserve further research of all kinds but are not ready for use in permitting and other formal decision-making processes.

Permitting and other formal decisions must rest on sound and proven science. Legal processes need to weigh knowable impacts to determine accurate understanding of net impact of a proposed project in line with NEPA “Hard Look” standard

The ultimate context: Climate Science



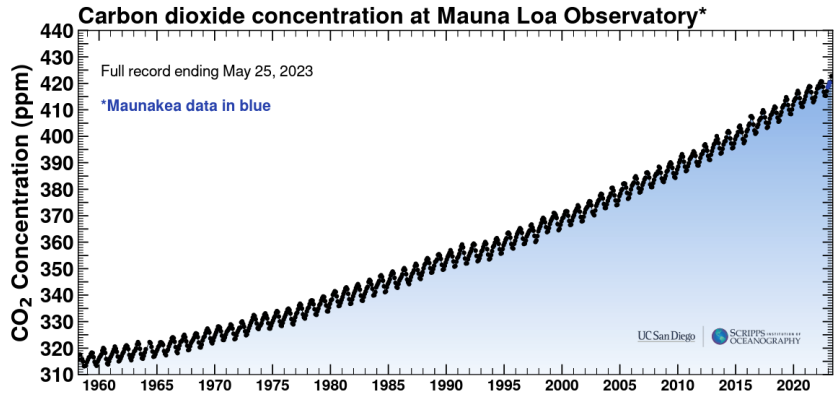
John Tyndall: "… the aqueous vapour of the atmosphere must act powerfully in intercepting terrestrial radiation; its changes in quantity would produce corresponding changes of climate. Subsequent researches must decide whether this vera causa is competent to account for the climatal changes which geologic researches reveal." John Tyndall, Proceedings of the Royal Society of London, 1860-1862, 11, pp 100-104.

Svante Arrhenius, On the Influence of Carbonic Acid in the Air upon the Temperature of the Ground, Philosophical Magazine and Journal of Science, April 1896

Noting that amateur scientist Eunice Foote presented a 2 page paper on these same phenomena in 1856

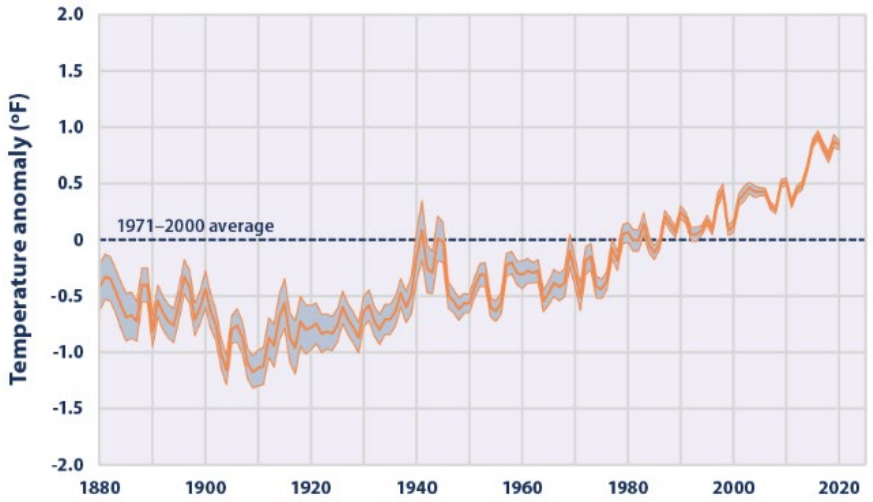
The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change.

The IPCC is the largest peer-reviewed scientific exercise in the history of humanity



The "Keeling Curve" demonstrates the unrelenting rise in greenhouse gases in our atmosphere

Figure 1. Average Global Sea Surface Temperature, 1880–2020



And our Oceans are taking the hit, absorbing energy that is translating into higher temperatures

And specific work on the impact of our changing climate on marine mammals continues to develop

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journal homepage: www.elsevier.com/locate/ecochg

Impacts of climate change on cetacean distribution, habitat and migration

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Abstract: "Climatic changes have had significant impacts on marine ecosystems, including apex predators such as cetaceans. A more complete understanding of the potential impacts of climate change on cetaceans is necessary to ensure their conservation . . . Existing research on the topic is both extremely limited and unevenly distributed (geographically and phylogenetically). Further research is necessary to determine which species and populations are most vulnerable and require the earliest conservation action."

Vol. 7: 125–136, 2009
doi: 10.3354/esr00197

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Printed May 2009
Published online May 14, 2009

Contribution to the Theme Section 'Incorporating climate change into endangered species conservation'

OPEN ACCESS

REVIEW

Global climate change, range changes and potential implications for the conservation of marine cetaceans: a review and synthesis

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Ocean Regime Shift is Driving Collapse of the North Atlantic Right Whale Population

By Erin L. Meyer-Gutbrod, Charles H. Greene, Kimberley T.A. Davies, and David G. Johns

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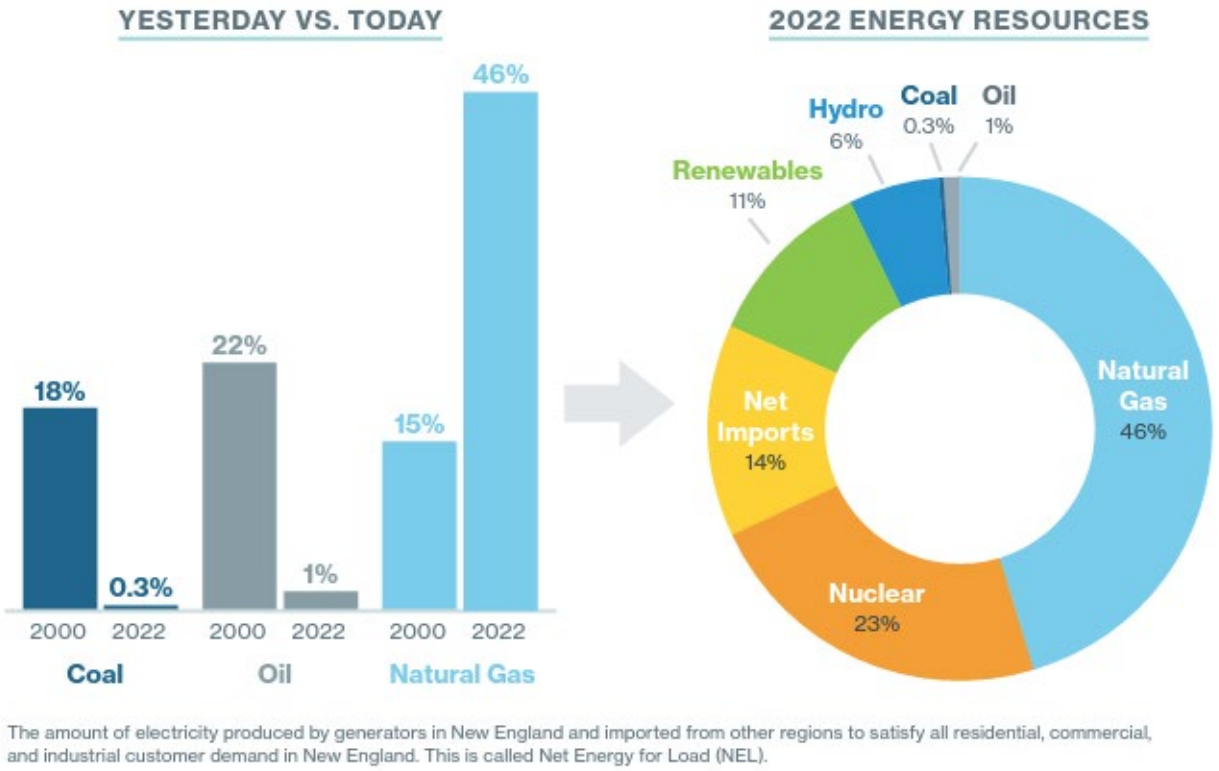
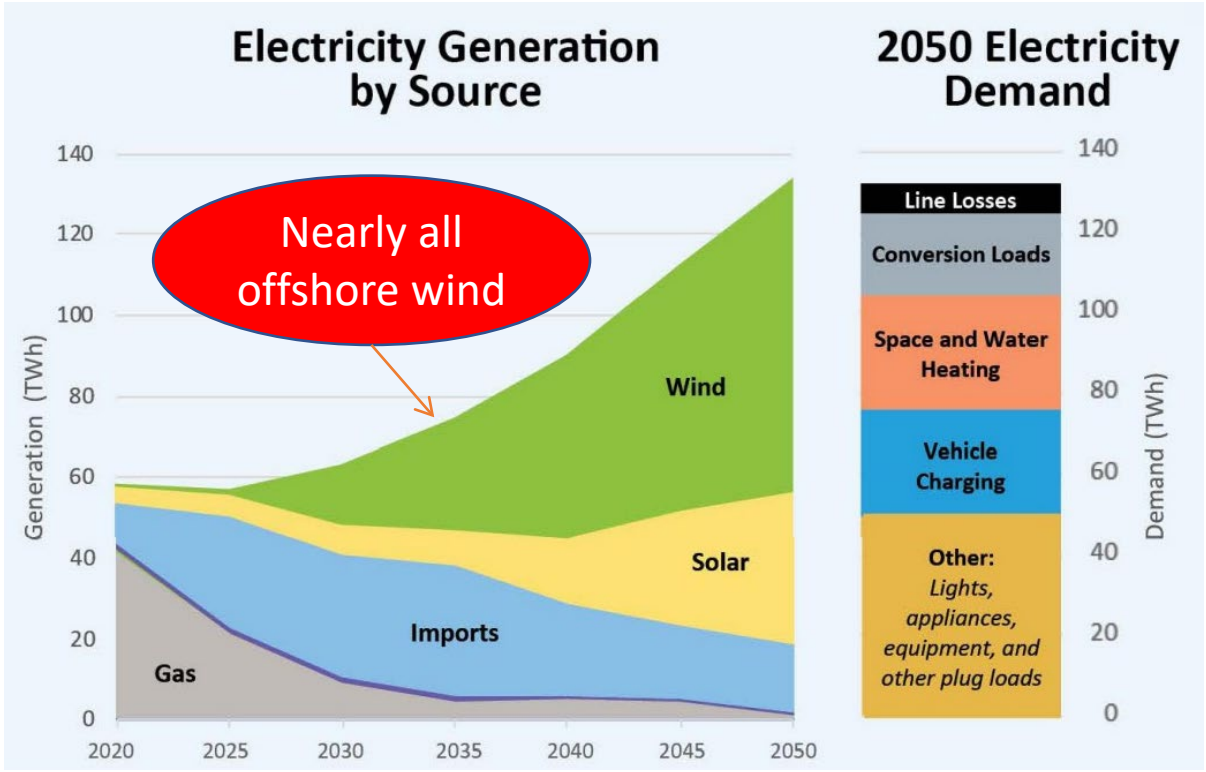
"Ocean warming linked to anthropogenic climate change is impacting the ecology of marine species around the world. In 2010, the Gulf of Maine and Scotian Shelf regions of the Northwest Atlantic underwent an unprecedented regime shift. Forced by climate-driven changes in the Gulf Stream, warm slope waters entered the region and created a less favorable foraging environment for the endangered North Atlantic right whale population. By mid-decade, right whales had shifted their late spring/summer foraging grounds from the Gulf of Maine and the western Scotian Shelf to the Gulf of St. Lawrence. The population also began exhibiting unusually high mortality in 2017 . . ." From Abstract

Offshore Wind and Reducing Emissions

New England as case study – high emissions (~1 ton CO2 per MWh) coal has been pushed off the grid but offshore wind is needed to finish the decarbonization job, especially given rising electric demand from heating/cooling & transportation



Source: ISO-NE Power Grid 2022-2023 Profile



Source: Massachusetts 2050 Climate Roadmap

This analysis is deeply consistent with rigorous global and regional analysis, see e.g., Climate Change Mitigation Potential of Wind Energy, Barthelmie and Pryor, *Climate* **2021**, *9*(9), 136 https://doi.org/10.3390/cli9090136, Aug. 2021.

The reality: we are burning higher carbon fuel to keep the lights on during "cold snaps" in places like the Northeastern US

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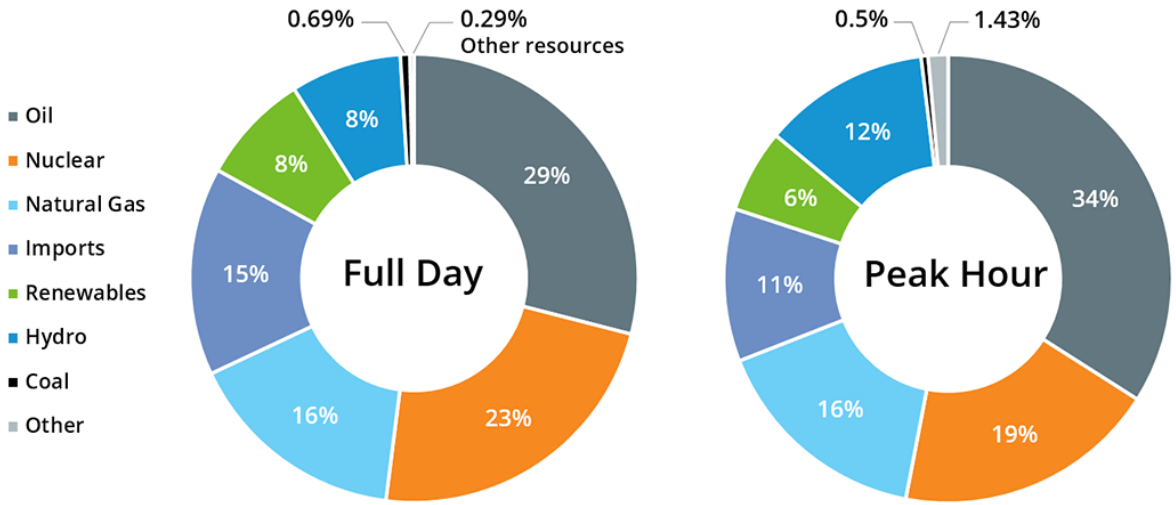
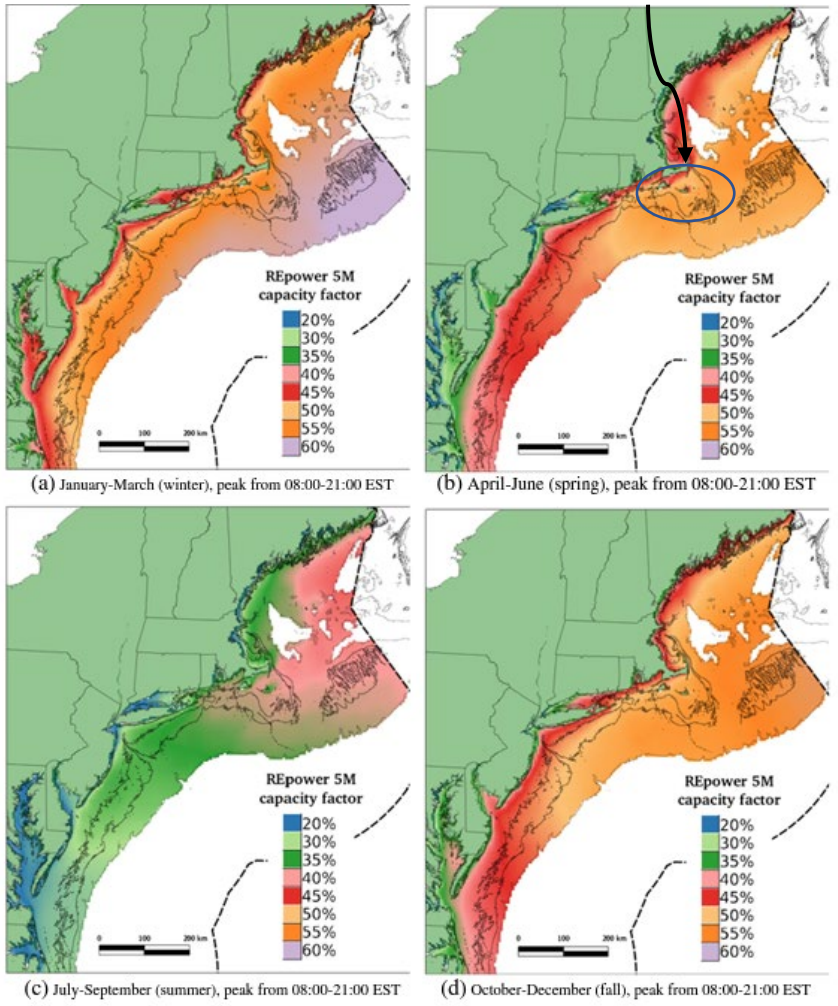
Sources of New England's electricity on December 24, 2022



Source: "ISO-NE maintains system reliability through generator outages, loss of imports on Christmas Eve, January 4, 2023"



. Ninety meter seasonal *peak-time* (08:00–21:00 EST) wind resource maps of capacity factor from 2006 to 2010 WRF-ARW REpower 5M, 5 MW turbine power curve. Isodepth contours are plotted at 30, 50 and 200 m maximum depth. The US exclusive economic zone is shown as the black dashed line.

Offshore Wind produces very well, especially in area south of MA & RI during Winter months

Source: US East Coast offshore wind energy resources and their relationship to peak-time electricity demand, Dvorak et al, WindEnergy 2013; 16:977–997, DOI:10.1002/we.1524.


Feel free to
float any
questions!
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