

Climate is No Longer “Not My Job”

Kellogg Reunion

Prof. Meghan Busse

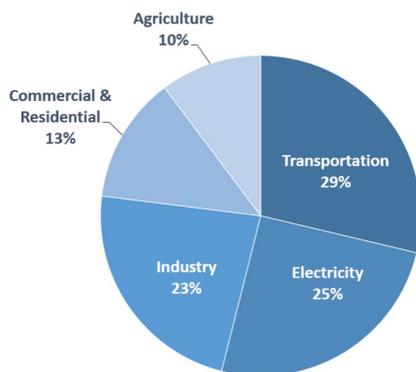
May 6, 2023

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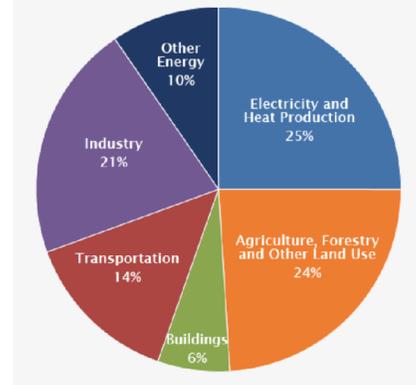
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Three quarters of U.S. greenhouse gas emissions come from electricity generation, transportation, and industrial processes

Total U.S. Greenhouse Gas Emissions by Economic Sector in 2019

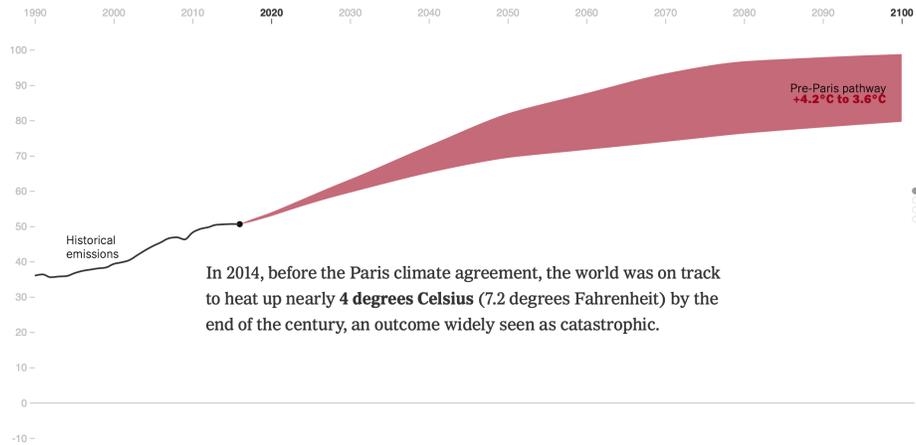


Global Greenhouse Gas Emissions by Economic Sector



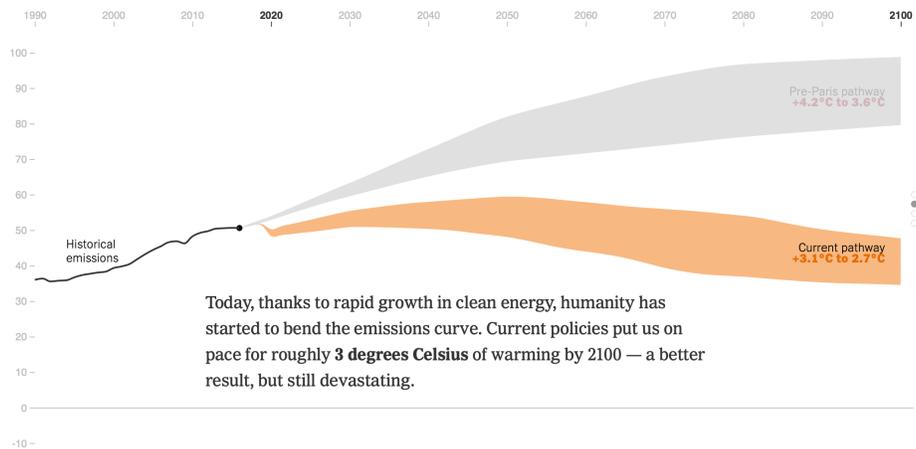
Before the Paris agreement, the world was on a path to catastrophic warming (4° C above pre-industrial level)

Global greenhouse gas emissions in gigatonnes CO₂-eq. per year, with projections of warming above pre-industrial levels by 2100



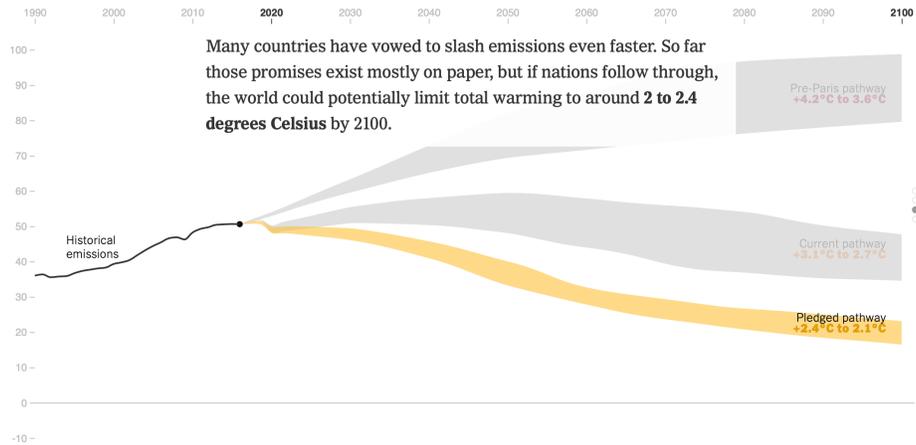
The Paris agreements helped redirect the path toward “devastating” (3° C) rather than “catastrophic”

Global greenhouse gas emissions in gigatonnes CO₂-eq. per year, with projections of warming above pre-industrial levels by 2100



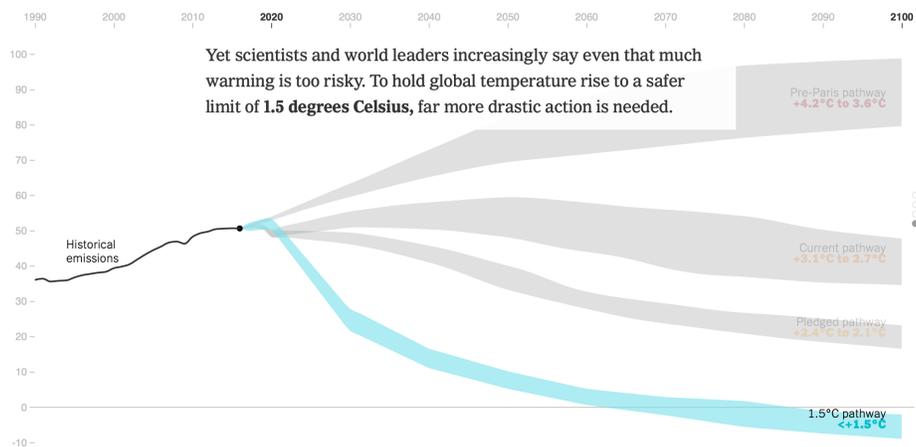
Even if countries fulfilled their current pledges that exceed the Paris targets, the total warming would be a little above 2° C

Global greenhouse gas emissions in gigatonnes CO₂-eq. per year, with projections of warming above pre-industrial levels by 2100



Scientists believe that the world really needs to keep to 1.5° C of warming, which means reaching net zero by mid-century

Global greenhouse gas emissions in gigatonnes CO₂-eq. per year, with projections of warming above pre-industrial levels by 2100



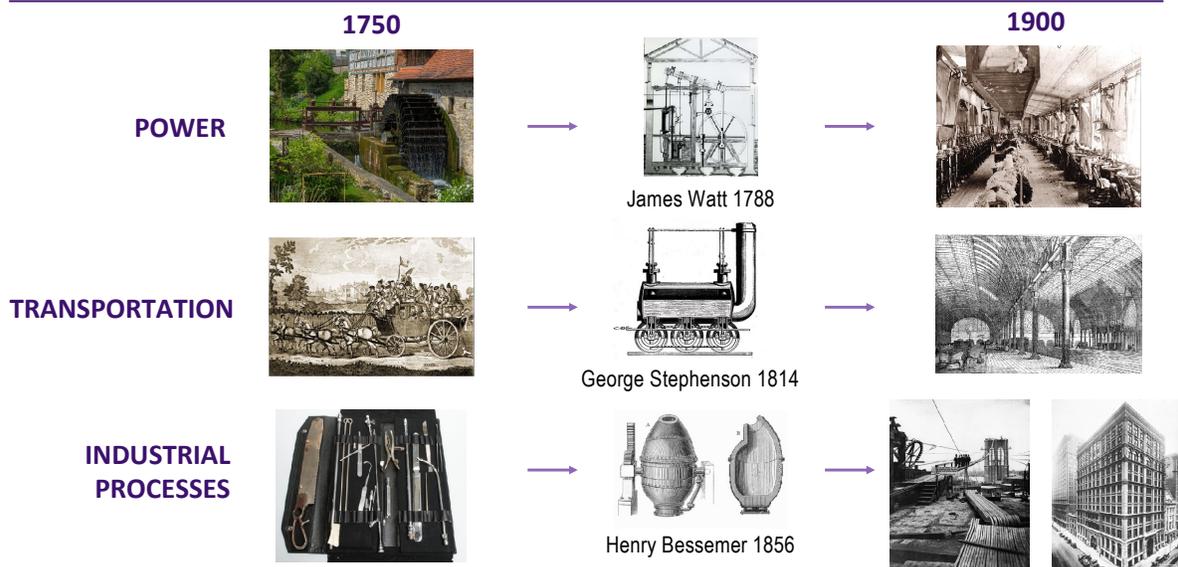
The transition to net zero is akin to a second industrial revolution

A SECOND INDUSTRIAL REVOLUTION

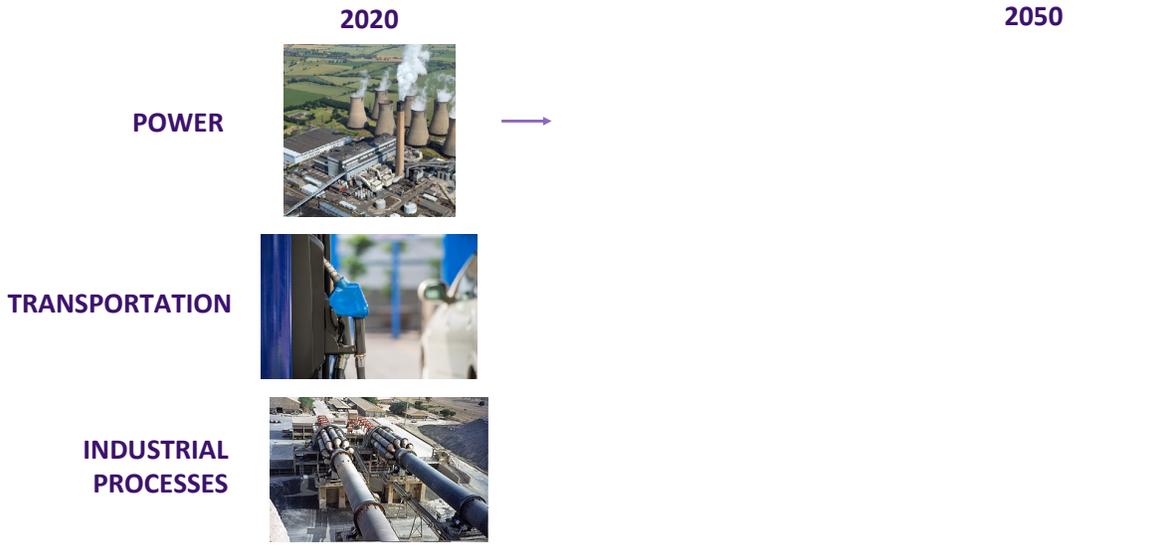
- In order to preserve our world's potential for peace, prosperity, health, and safety we need to **radically transform most our economic activities**
- This will require **new processes, new devices**, and building lots of **new infrastructure**
 - There are **business opportunities** in providing all of these
- Similar to the transformation of the first **industrial revolution**



The Industrial Revolution transformed the economy

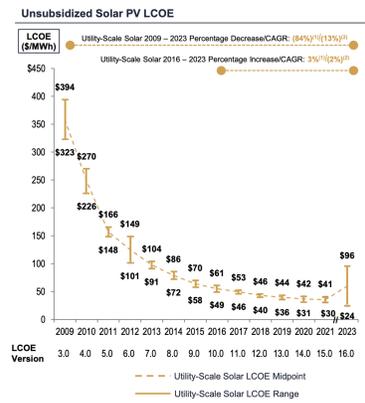
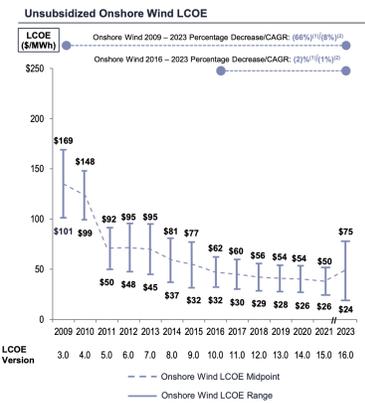


We have about 30 years to transform our economy



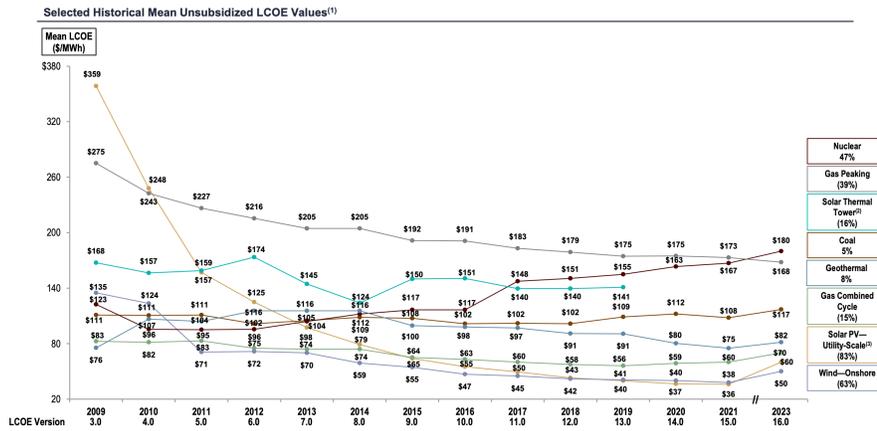
Electricity: Where are we now?

ELECTRICITY TRANSITION TO RENEWABLES



Electricity: Where are we now?

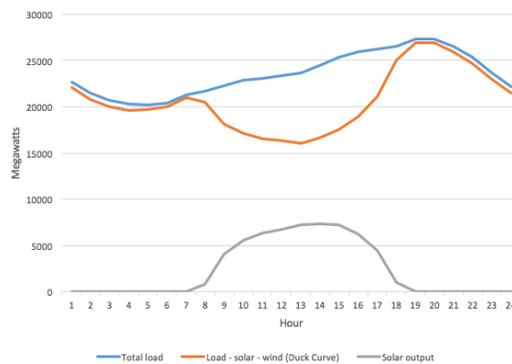
ELECTRICITY TRANSITION TO RENEWABLES



Electricity: What do we still need? (Where are there opportunities?)

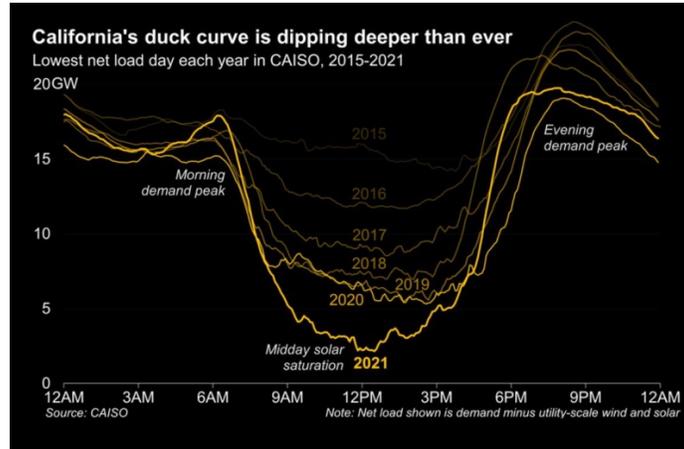
INTERMITTENCY AND STORAGE

California hourly electric load vs. load less solar and wind (Duck Curve) for October 22, 2016



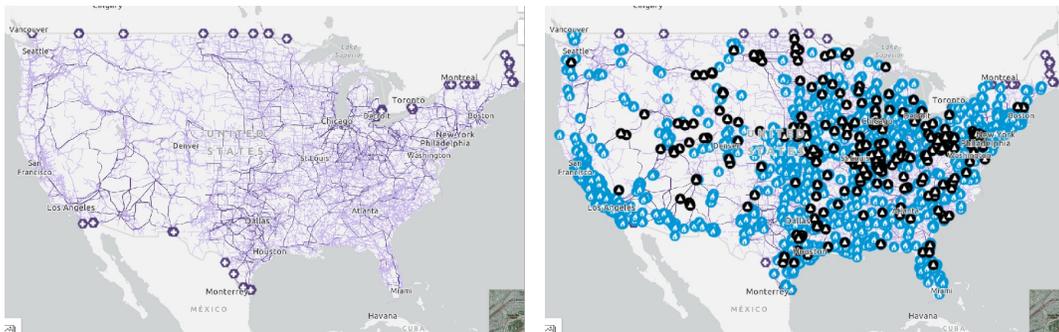
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INTERMITTENCY AND STORAGE



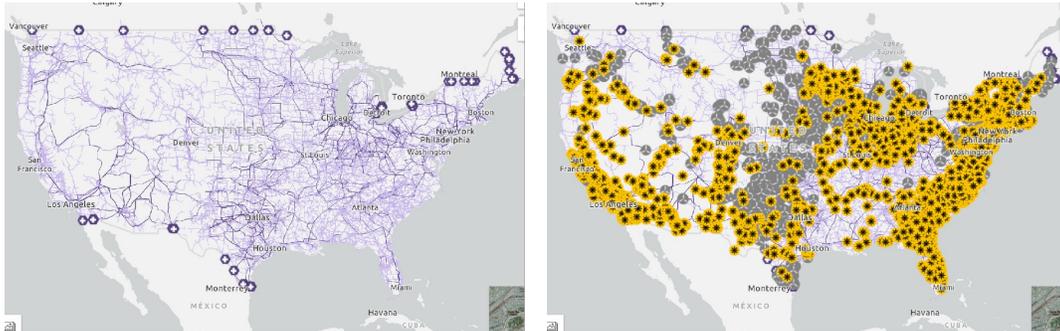
Electricity: What do we still need? (Where are there opportunities?)

GRID INVESTMENTS



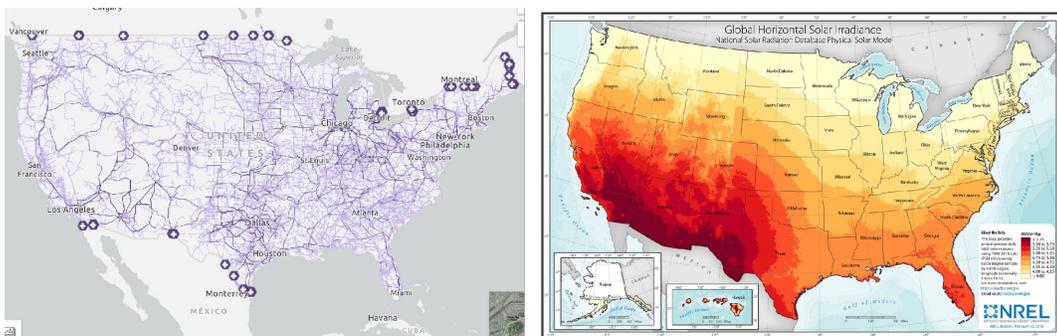
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GRID INVESTMENTS



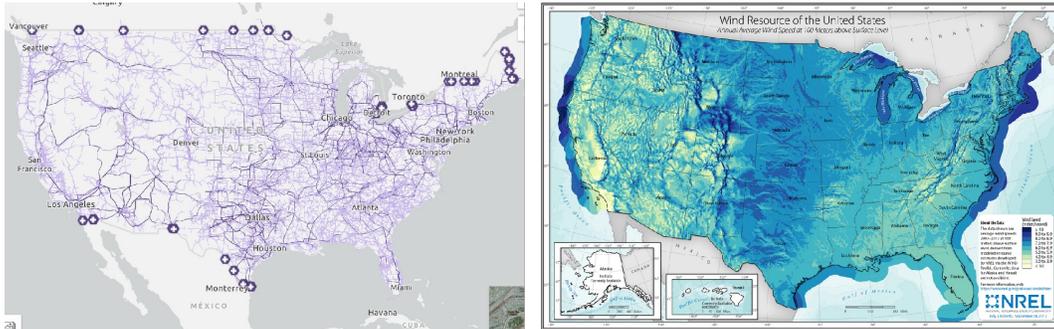
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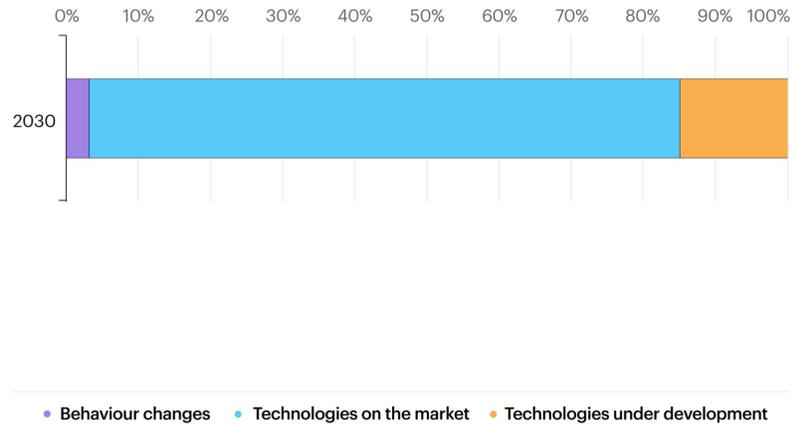
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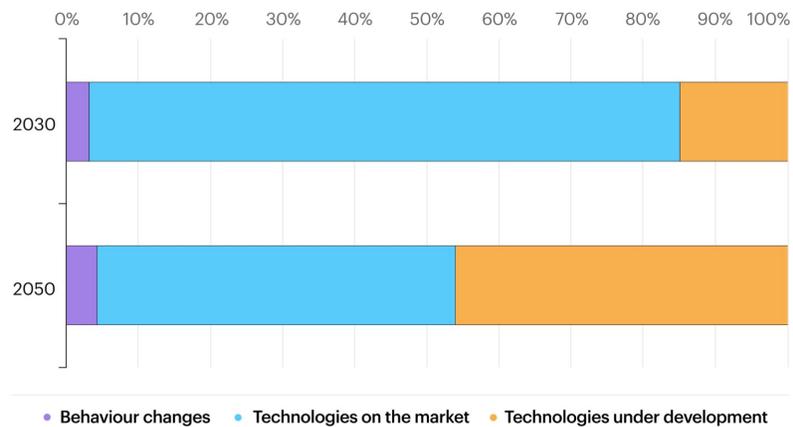
Early in the transition, we will need increased deployment of existing technologies

Annual CO₂ emissions savings in the net zero pathway, relative to 2020



We should also be working on the technologies we will need in the future to decarbonize activities we can't yet

Annual CO₂ emissions savings in the net zero pathway, relative to 2020



If climate is my job, what should I be doing?

MAKING CLIMATE YOUR JOB

- **Perceive the situation accurately.**
- **Mobilize to respond.**
- **Move climate and sustainability out of the silo.**
- **Advocate for the long-run.**

Executive Education

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