US Clean Energy Landscape

For the Oregon House Committee on Energy and Environment

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TRANSFORMING THE GLOBAL ENERGY SYSTEM TO SECURE A CLEAN, PROSPEROUS, ZERO-CARBON FUTURE FOR ALL.

RMI
ENERGY. TRANSFORMED.

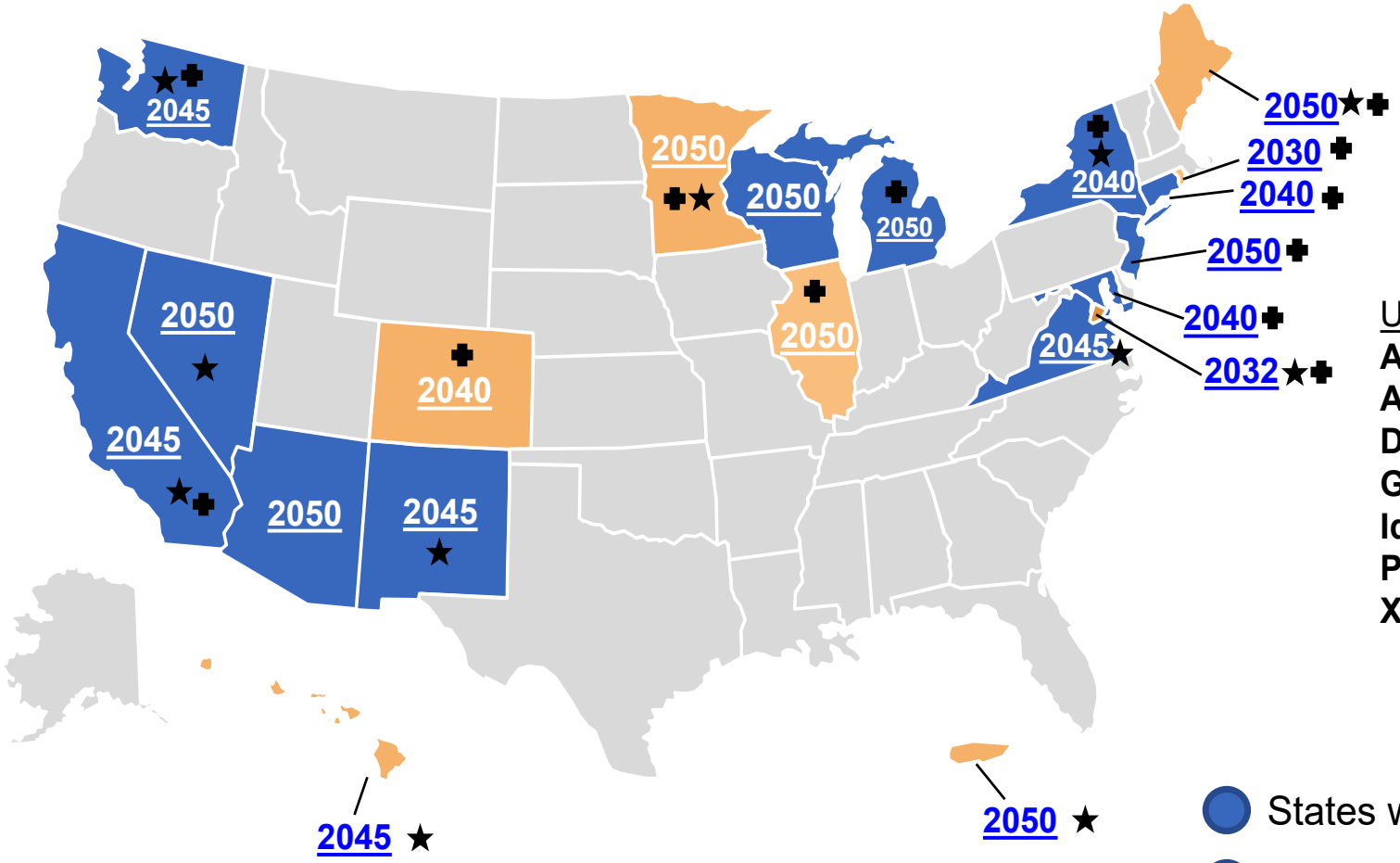
- Nonprofit, nonpartisan, independent, research & collaboration firm
- Founded 1982: 40-year track record of leveraging market driven change
- 300+ staff with offices in California, Colorado, New York, Washington DC, China, India.
- Focus on Market-based approaches to clean energy
- “Think and Do” tank
- History of deep collaboration and coalition-building

Presentation Outline

Please ask questions!

- **National trends:** Clean energy commitments & deployment
- **How difficult or costly will clean energy be?**
- **Example:** Colorado
- **Equity, justice, and the transition**
- **Implications of the latest climate science**

18 states & 2 territories have made 100% clean power commitments. In 2018, there were only two.



Utilities Committed to 100% Clean Energy

APS (AZ)
Avista (WA, ID, OR)
Duke Energy (OH, KY, TN, NC, SC)
Green Mountain Power (VT)
Idaho Power (ID, OR)
Public Service Co. of New Mexico (PNM)
Xcel Energy (MN, MI, WI, ND, SD, CO, TX, NM)

- States with 100% clean energy target
- States with 100% renewable energy target
- ★ States where the goal is codified in law
- ✚ States with economy-wide decarbonization targets

Source: Advanced Energy Economy, December 2020

Prospects for Federal Action & Legislation

- **The Biden cabinet is focused on climate, from Transportation to DOE to State (certain)**
- **Infrastructure bill (likely)**
  - Likely to include large investments in clean energy infrastructure
  - Possibly bipartisan, or through reconciliation
- **CLEAN Future Act (uncertain)**
  - Clean Electricity Standard: 100% by 2035
  - Responsible transmission build-out
  - Buildings, transportation: electrification and efficiency
  - Worker transition & environmental justice

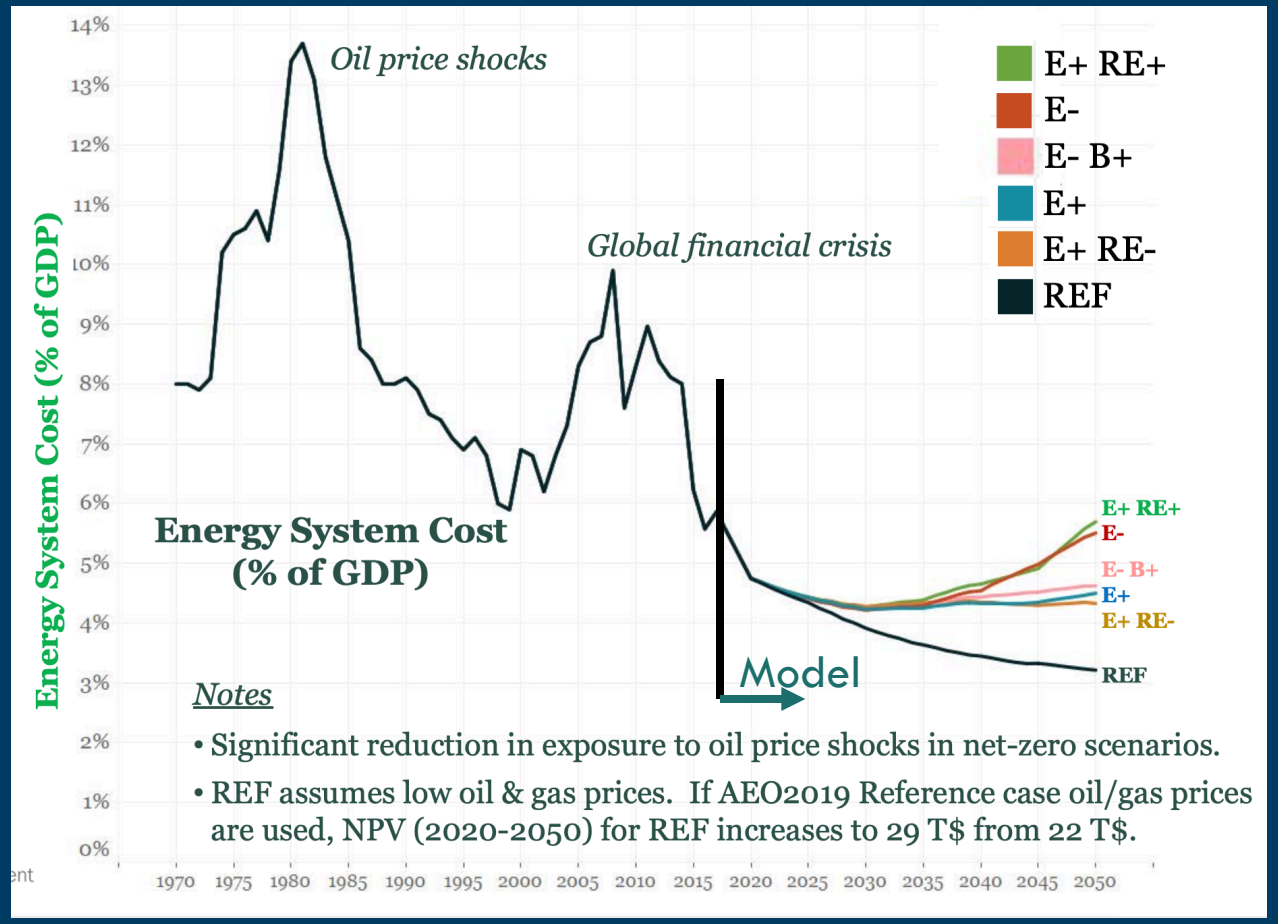
Globally, many nations have committed to 100% decarbonization.

Nations not part of the Paris climate accord:

- Iran
- Iraq
- Turkey
- Libya
- Eritrea
- Yemen
- ~~USA~~

Opinion: National climate legislation is a question of "what & when" – not "if"

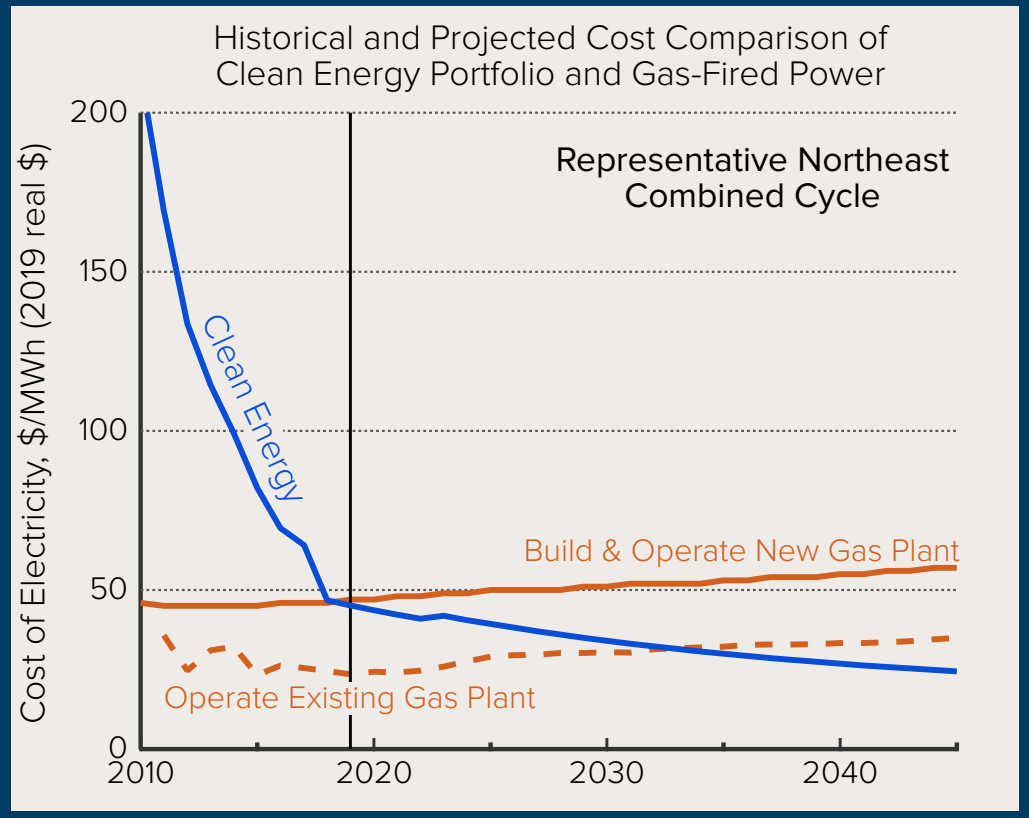
Numerous, rigorous studies show decarbonization is possible – and not expensive



2020 Princeton Net-Zero America Study

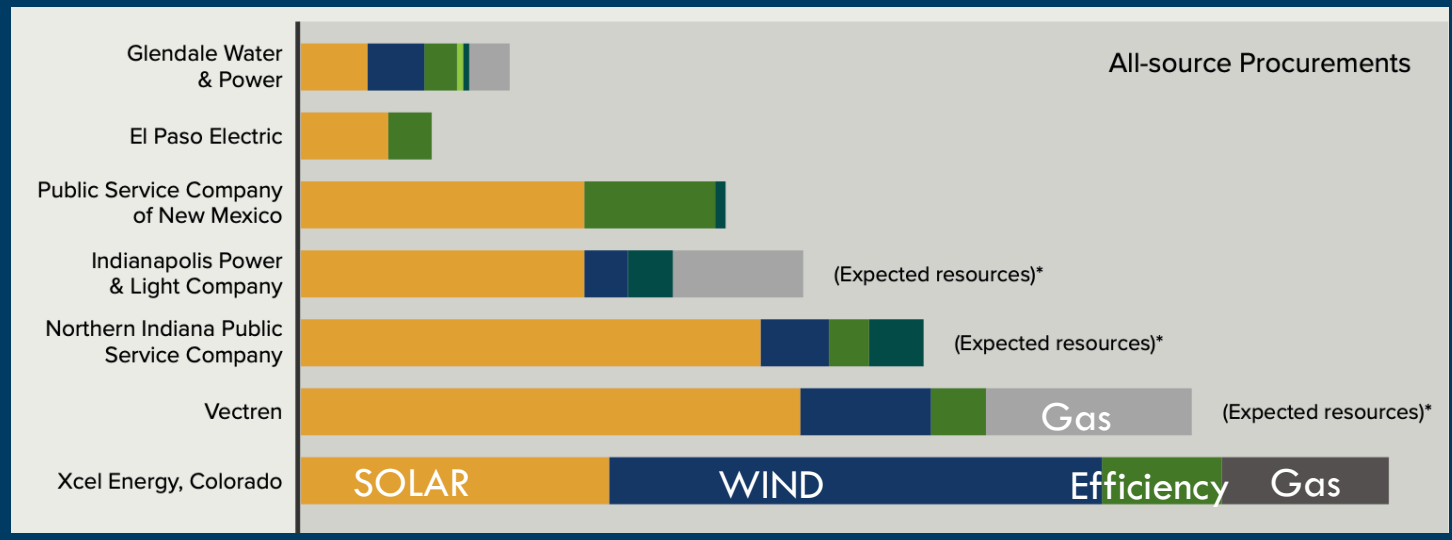
- Greater-than-forecasted cost declines of wind, solar, storage, EVs have helped reduce expected costs.
- While the cost is low, the extent of economic change and disruption is large
- The next steps are no-regrets & low cost
- The last ~15% of decarbonization is much less certain and depends on new technologies

Reducing electricity emissions is the lowest cost first step*



Clean energy portfolios are lower cost than new gas generation today.

2019: RMI.org/CEP-reports



When utilities state their needs and ask the market what it can offer with 'All-Source Procurements,' clean energy is the lowest cost.

Consistent with market interconnection queues that are dominated by wind, solar, and storage

2021: RMI.org/how-to-build-CEPs

* Limiting warming to 1.5°C requires immediate action in all sectors

Colorado set an economy-wide goal and has continually added policies needed to meet it

2017
Xcel "All Source Procurement" selects mostly clean energy

2018
Xcel commits to 100% carbon-free by 2050

2019
Governor Polis "Roadmap to 100% Renewable Energy" by 2040

2019
14 bills including 90% reduction by 2050 with 2025 & 2030 goals, EVs, just transition, PUC modernization

2020
Tri-State Responsible Energy Plan

2020
Colorado, with E3, develops GHG roadmap – using modeling, a detailed plan for meeting its goals

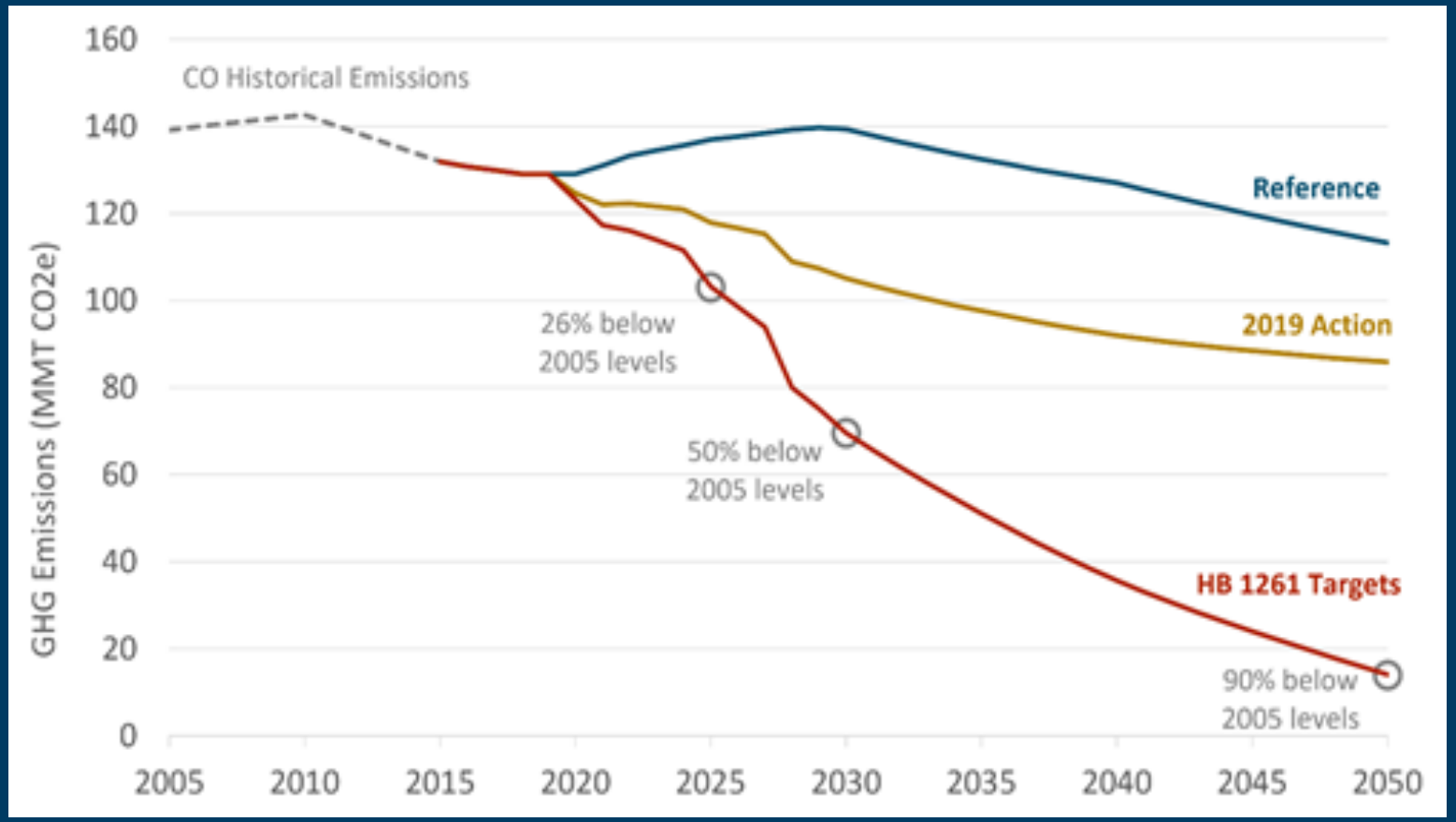
2020
Colorado EV Plan

2021
Updated clean energy plan. Transmission expansion to bring rural wind & solar to Denver metro

Coal retirement

Impacts to Colorado: Jobs & reduced emissions & open issues

Wind turbine manufacturing facility in Pueblo, CO



Colorado's GHG roadmap shows the likely impact of 2019 laws – and what is still needed:

- How to transition the large oil & gas industry
- Further accelerate electrification of cars and buildings
- Transmission expansion

Increasingly, justice & equity are central to energy planning, including Biden policy & CLEAN Futures Act

PROCEDURAL EQUITY

- WA: Requires utilities work with an Equity Advisory Group when planning.
- NM: Economic-development proposals reviewed by a panel of impacted tribal and San Juan County leaders from the impacted community.

STRUCTURAL EQUITY

- CO, NY, & WV established Just Transition offices to guide policy and implementation. Required to work directly with impacted communities.
- CA CPCU requires utilities use equity metrics to assess planning impacts on disadvantaged communities.

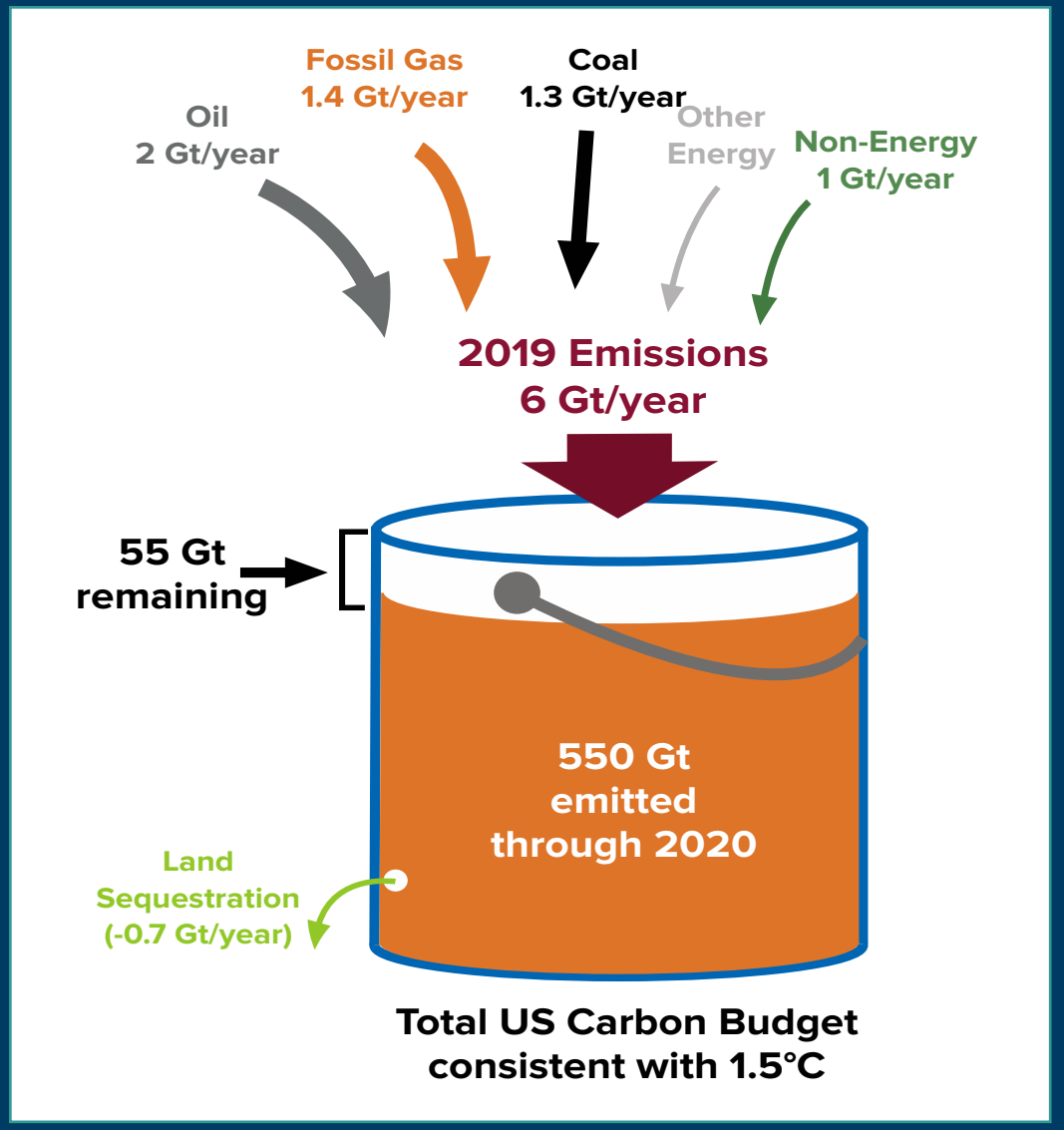
DISTRIBUTIONAL EQUITY

- WA: Mandates that utilities account for distributional equity in planning
- MI: Laws require transition minimize impacts on communities directly affected by changes to energy production, including loss of employment.

Climate impacts are growing. To limit warming to 1.5°C requires urgent, drastic action

- The International panel on climate change (IPCC) clearly and unequivocally states that limiting warming to 1.5°C is essential
- Climate impacts are defined by <u>cumulative</u> emissions – not whether we eventually reach zero.

For the foreseeable future, the most important year to act will remain "This Year"



Climate action is urgent. Experience and analysis show that 2020's actions are affordable and do-able. It is essential to consider equity and justice to sustain the transition.

State & federal policies likely to support emissions reductions	• Climate 'facts on the ground' will increase urgency • States are having success with clean energy goals
Experience & modeling show today's actions are affordable	• New, clean technologies are now also the cheapest • Immediate actions are clear; the last ~15% uncertain but improved technologies likely to help
Equity & justice are necessary for success	• Policies that support today's workers and include historically disadvantaged communities are more likely to succeed • "Least-cost" is not the sole criteria for "best" pathway

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