



THE U.S. INFLATION REDUCTION ACT OF 2022

**It's Impact on SAF Deployment in the USA and
What Happens in 2025??**

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Inside the IRA

- ▶ 10-year horizon (2022-2033)
- ▶ ~Two Dozen Tax Provisions to Accelerate the Deployment of Clean Energy, Clean Vehicles, Clean Buildings, and Clean Manufacturing (many unlimited). These Include Production and Investment Tax Credits.
 - ▶ Manufacturing – Solar, Wind, EV's, Batteries, Retrofits, Fuels, H2, CCUS (expanded from Trump admin), etc.
 - ▶ Consumer – EV credits, Clean Energy, etc.
- ▶ Supercharged the DOE Loan Programs with \$400B of lending authority for GHG Reducing Project Finance
- ▶ New DOE Offices and funding for grants, etc. (e.g. Office of Clean Energy Demonstration – USD\$ 8B - H2 Hubs, \$2.5B – Adv Nuclear, \$7B DAC/Carbon Mgmt. etc.)
- ▶ IRS funding, Health Care Funding/Pharmaceutical Cost Caps, Higher Corporate Taxes
- ▶ Initially Projected to Cost USD\$ 370B, Now Projected to be \$800B or close to \$1 Trillion

It's Not Just about the IRA – Also the Bipartisan Infrastructure Law provides funding for Renewable Infrastructure

▶ Tax Credits

▶ Production and Investment Tax Credits

- ▶ 40B – SAF Tax Credit for sale or use of SAF (expires 1/1/25): State Level Credits Continue
- ▶ 45Q – CCS – Max of \$85/tonne for CCS(\$60 for CCU or EOR): DAC: Max \$180/tonne CCS (\$130 – CCU/EOR) 12 years from first injection starting before 1/1/33 (TF)
- ▶ 45V – Clean Hydrogen Production Tax Credit – up to \$3/kg (Transferable-TF)
- ▶ 45Z – Clean Fuel Production Tax Credit (includes SAF) - \$0.07-1.75/gallon (starts 2025) depends on CI/other (TF) Through 2027
- ▶ 48C – Advanced Energy Project Credit (retrofit/retool existing fossil assets to reduce GHG)(TF)

▶ Loans for Project Finance – DOE Loan Programs Office >USD\$300B

▶ Grants to Advance TRL -5/6 to 7/8 - OCED has \$25B: DOT FAST program \$290M

▶ Other Credits – State Tax Credits, Low Carbon Fuel Standard(4 states + BC & 5 others in legislation (New York, Vermont, Michigan, Illinois, Minnesota), Renewable Fuel Standard

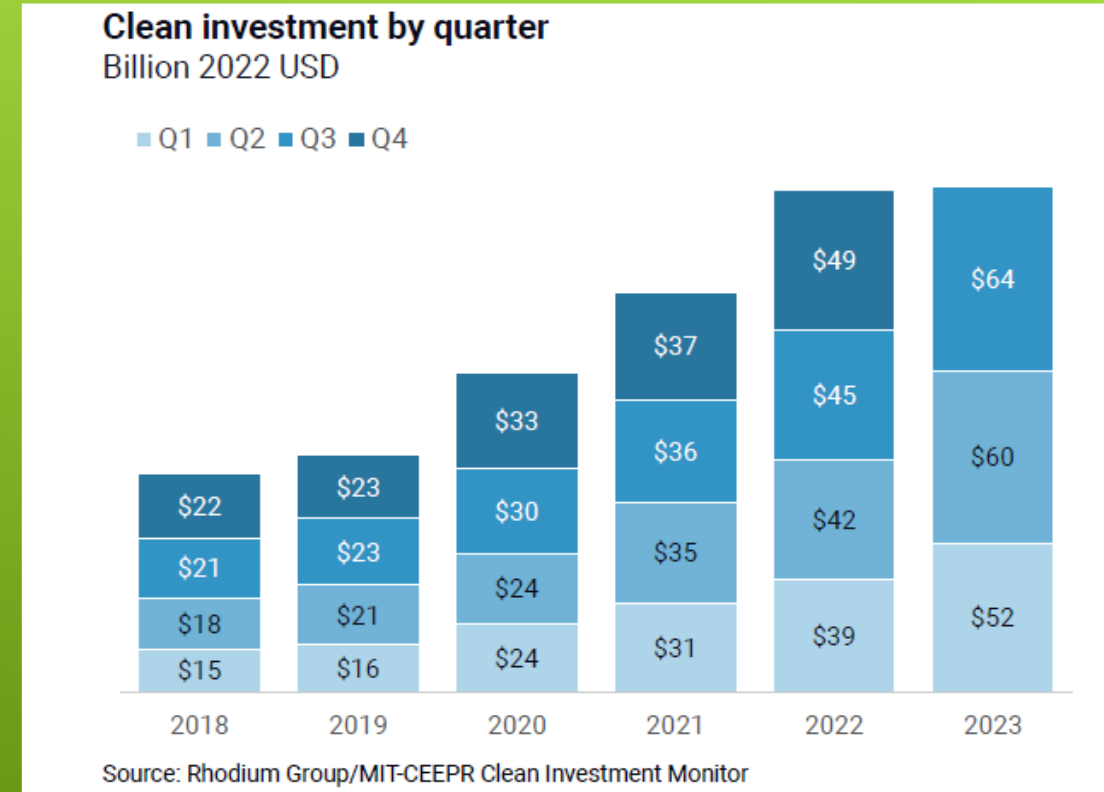
In 2021, US Created the SAF Grand Challenge

- ▶ Comprehensive Interagency Focus on Scale-up and Deployment of SAF Production – Includes DOE, USDA, DOT, EPA, and others
- ▶ Objectives of (1) expanding SAF supply and end use, (2) reducing the cost of SAF, and (3) enhancing the sustainability of SAF
- ▶ Goal is to Reduce Aviation emissions by 20% in 2030 and 100% by 2050.
 - ▶ Target Production of 3 Billion GPY (9M TPA) by 2030
 - ▶ Target Production of 35 B GPY (105M TPA) by 2050
- ▶ Grants and Funding for R&D, Pilot, Demonstrations



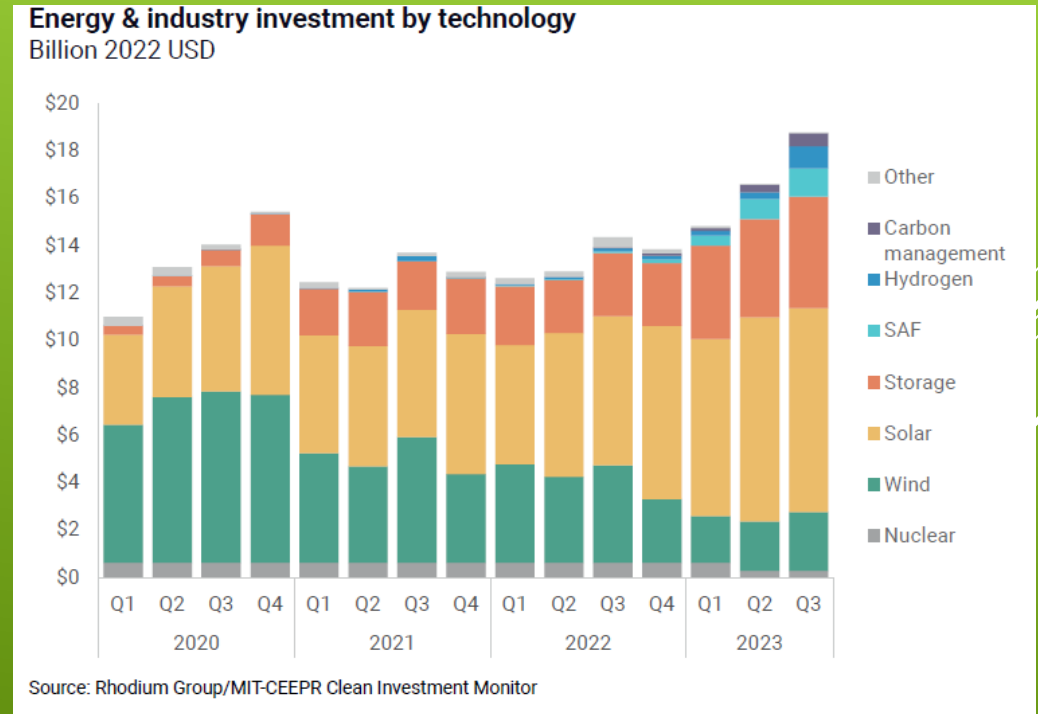
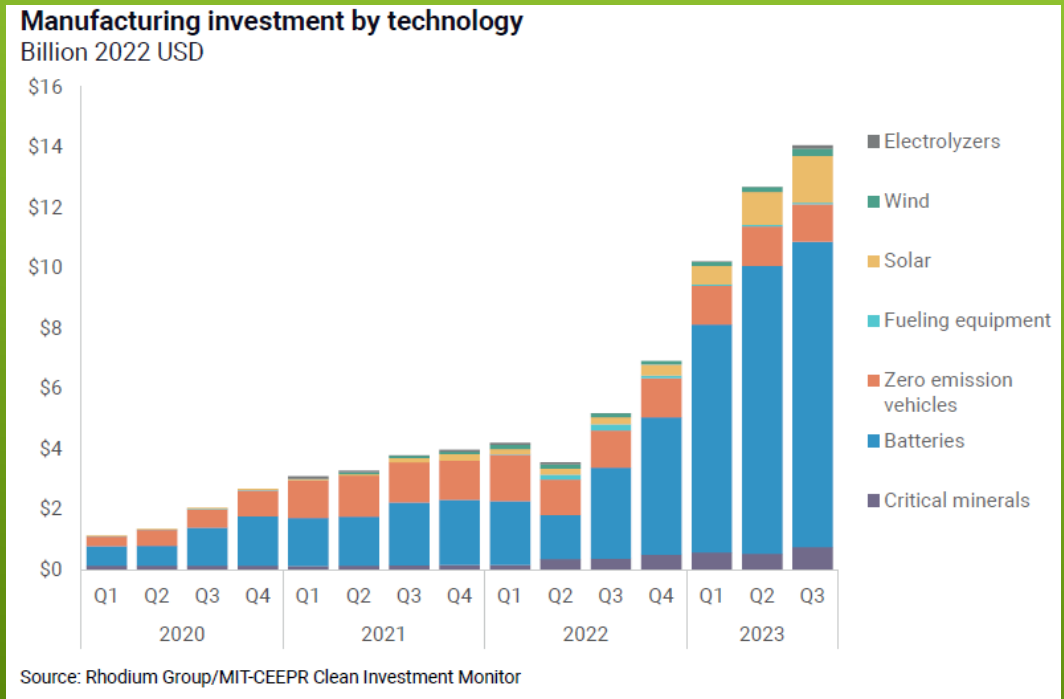
IRA has Supercharged Investment in Clean Energy and Transportation Investment

- ▶ The Elements of the IRA are Very Popular with American Business Nationwide
- ▶ Clean investment accounted for 4.9% of total US private investment in structures, equipment, and durable consumer goods nationwide in 3Q23, Compared to 3.4% in 3Q22 and 1.2% in 1Q18.
- ▶ In First 3 Quarters of 2023, there was \$178 billion in private clean investment in the US, up 40% from the previous year period.
- ▶ In the Last Six Months, the growth in investment is continuing.



WHAT HAS HAPPENED IN 18 MONTHS?

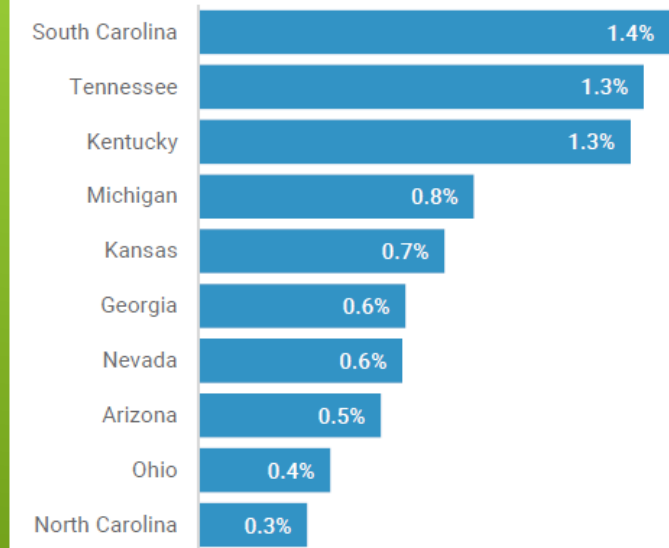
- ▶ In First year of IRA, 272 Projects were Announced or Advanced Totaling \$278 Billion in Investment
- ▶ Projects were Distributed Across 44 States and Territories
- ▶ Estimated to Create over 170,000 Clean Energy Jobs



Approximately 65% of Private Investment in Response to the IRA is Being Deployed in States Won by Trump in 2020.

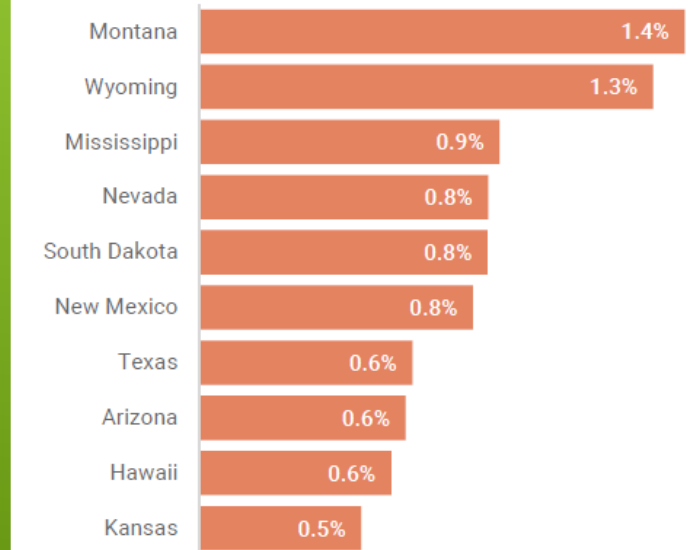
- ▶ Top States Benefiting from Overall IRA Investment Include:
 - ▶ Georgia, South Carolina, Michigan, Ohio, Tennessee, Texas, New York, North Carolina, Arizona, California

Top ten states for clean manufacturing investment
Percent of gross state product, Q4-2022 through Q3-2023



Source: Rhodium Group/MIT-CEEPR Clean Investment Monitor

Top ten states for clean energy and industry investment
Percent of gross state product, Q4-2022 through Q3-2023



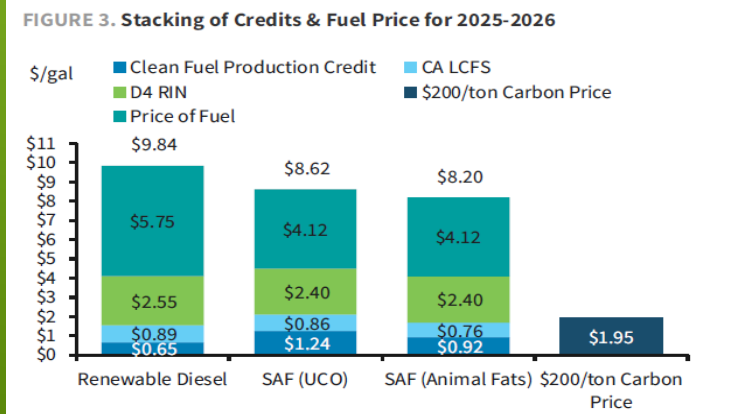
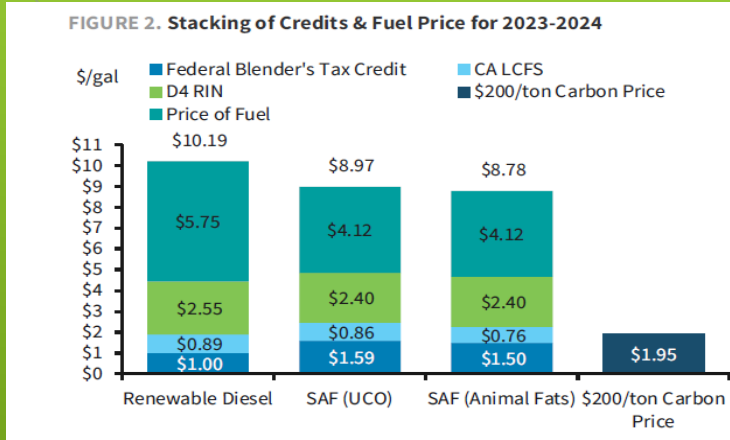
Source: Rhodium Group/MIT-CEEPR Clean Investment Monitor

Despite progress towards near-term targets, SAF continues to face barriers to achieving commercial scale:

- ▶ U.S. Is Seeing Deployment of Multiple SAF Technologies: HEFA (both new and Refinery Conversions), Alcohol-to-Jet (Brazilian and 2G), Gasification (Biomass, MSW, Wastes), Pyrolysis (Waste Plastics, MSW, Biomass) and eFuels
- ▶ High prices and insufficient incentives, causing lack of parity with other renewable fuels (i.e. Renewable Diesel).
- ▶ Financing difficulties (especially Development Capital), though improved by consistent, long-term Federal/State support.
- ▶ Limited feedstock availability for some technologies (FOGs, low carbon ethanol).
- ▶ Technical and Timing challenges moving from pilot to commercial scale.
- ▶ Constraining offtake agreements with limited potential for scale, until supply reliably increases, and pricing stabilizes.

SAF IS IN COMPETITION WITH RENEWABLE DIESEL

2022: RD incentives and fuel price can be more attractive



RIN and CA LCFS based on recent pricing & fuel price reflects June 2022 average

Source: Barclays Equity Research, August 2022

2024 and beyond: \$1.20-1.70/gal spread between RD and SAF slightly improved by patchwork of state incentives (CA, IL, MN, WA)

	Program/Credit	Description	Incentive (\$/gal)	Duration
Federal	SAF Tax Credit	CI-adjusted	1.25-1.75	2023-2024
Federal	Clean Fuel Production Credit (CFPC)	CI-adjusted; RD incentive only up to \$1/gal	1.75	2025-2027
Illinois	SAF Purchase Credit (SAFPC)	SAF sold to or used by an air common carrier for use in Illinois	1.50	2023-2032
Minnesota	SAF Tax Credit	SAF produced or blended for use in Minnesota	1.50	2024-2030
Washington	Alternative Jet Fuel Incentives	Production or use of SAF in the state of Washington, CI-adjusted	1.00-2.00	2024 (9-year duration)*

* 9-year time frame starts first year 20M Gal are produced or blended Source: Stillwater Associates, April 2023

AFTER 2024 – WHAT HAPPENS?

- ▶ The Closer We Get to the Election, the More I Hear This Question.
- ▶ First Answer is Nobody Really Knows What Happens in 2025 if There is a Change in Government (President and/or House and Senate)
- ▶ Important to Remember that IRA and the Bipartisan Infrastructure Bills are Laws and **MUST** be Repealed for Meaningful Changes to be Enacted
- ▶ Tax Credits are Perceived as Tax Cuts and Therefore Repealing them is like Raising Taxes, so They are Likely Very Safe.
- ▶ Considering the Popularity of the IRA Programs (with Business, Entrepreneurs, and Wall Street) and the Speed at Which Private Investment is Occurring, It Could be Very Challenging **POLITICALLY**
- ▶ And Considering the Impact on Investments in Republican States and Congressional Districts, It's Likely that the IRA **IMPLEMENTATION** could be tweaked around the Edges but to Continue to Incentive Clean Energy Investment in the US, including **SAF**.



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Thank you!

Questions?