

Analysis of Climate Leadership Council Proposal

Summary of Key Findings

By driving technological innovation, the CLC plan would reduce US CO₂ emissions by 57% by 2035 (vs. 2005), unlock \$1.4tn of new investment, create 1.6M jobs and enhance US competitiveness.

- ***CLC Plan as Basis for Modelling:*** Thunder Said Energy* modelled the consequences of a \$43/ton CO₂ price in the US starting in 2021, then rising by 5% above inflation each year, reaching \$112/ton by 2035. Our bottom-up analysis assessed the impact on the costs and potential benefits of 30 different energy technologies. This summary is drawn from our longer report.
- ***Emissions Reductions of 57% by 2035:*** Based on the cumulative emissions reductions of 30 different decarbonization technologies, unlocked at different price points, the CLC plan would reduce US CO₂ emissions by 57% from the EPA's 2005 CO₂ baseline. See Figures 1 and 2.
- ***\$1.4 Trillion of New Capital Investment in Technological Innovation:*** The plan would produce an initial investment surge of \$95bn of new spending in 2023 and create 195,000 direct new jobs that year. By 2035, the CO₂ price would unlock a total of \$1.4tn of new capital investment in energy-related technological innovation. See Figure 3.
- ***Up to 1.6 Million Jobs Created:*** As per Figure 4, the plan would create 195,000 direct new energy-related construction and operational jobs in 2023, increasing to 255,000 direct new jobs in 2035. Cumulatively, this would lead to the creation of up to 1.6 million new jobs by 2035, including multiplier effects.
- ***Renewable Output Rises 3.3x:*** The longer-term energy system would be transformed. Renewable output would rise 3.3x to 1,350TWH by 2035, moving from 10% to 29% of the net electricity grid, saving 330MT of CO₂ per year. See Figure 5.
- ***Revenue Raised:*** In the first year, the CLC plan could raise \$230bn in gross CO₂ fees, which can be returned to all Americans as equal quarterly dividends. That revenue could increase to \$340 billion in 2035. See Figure 6.
- ***900TWH of Electricity Generation Would Switch from Coal to Gas*** by 2023, displacing 440MTpa of coal, stoking gas use by 13bcfd (+15% from 2019) and saving 600MTpa of CO₂ (10% of total US emissions). Gas demand would remain above 80bcfd all the way to 2035. All coal used in 2035 would be in plants fitted with CCS.
- ***Renewables Would Reach 30% of the Gross Grid*** by 2035 as wind and solar spending would continue near its record 2019 pace of \$55bn of investment. Increased CO₂ prices would accelerate deployment of new wind and solar generation, which increased at 40TWH per annum in 2014-19 and which would rise at 50TWH per annum in 2020-25 and 70TWH per annum in 2025-2030. See Figure 5.



- **Industrial Efficiency Gains Would Double:** Industrial efficiency would grow 2% per year, helping to save another 300Mtpa of CO₂ and limiting future growth in US energy demand. Novel technologies would progress faster, advancing the US' competitiveness: most notably, additive manufacturing could save 6% of global CO₂ and re-shore manufacturing supply chains from emerging markets back to the US.
- **Decarbonization Would Become a Competitive Sector:** A rising price on carbon would allow a wide range of decarbonization technologies to become cost-effective, including yet unknown solutions, further incentivizing technological innovation.
- **Levelling the Playing Field:** One of the greatest advantages of a CO₂ price is that it creates a level playing field for different decarbonization technologies to compete. Thus, the most economical technologies can gain traction. By contrast, if policymakers seek to incentivize individual technologies, there is a danger of selecting overly expensive ones while stifling the emergence of superior alternatives.
- **Most Efficient Companies Would Win:** As rising CO₂ prices would steepen cost curves, the most carbon-efficient companies would benefit, particularly in energy-intensive and low-margin sectors, such as refining and basic materials.
- **Competitive Advantage for US Companies:** Manufacturing currently occurring in Southeast Asia, or other emerging market countries, would be incentivized to return to the US, closer to the products' point of use. Manufacturing goods in the US using the most efficient and lowest carbon technologies would benefit from a border carbon adjustment.
- **Inducing Emissions Reductions in Other Countries:** For global coal-to-gas switching to reach its full potential, delivering 20% of the world's decarbonization by 2050, it would be necessary for other countries to switch coal to gas too. In Europe and Asia, \$40/ton is required to encourage this, as gas is 2x more expensive than the US average. The CLC's proposed border carbon adjustment could accomplish this.
- **Accelerating Electrification:** The CLC plan would accelerate the electrification of light passenger vehicles. Electric vehicles are already economical without a CO₂ price. CO₂ prices could create a \$500-1,000 per annum financial incentive to 'go electric' in 2030-35, deducting a further 2.5Mbpd from our prior 2035 assumptions.
- **Incentivizing Additive Manufacturing:** The rising carbon price would lead to steep 65-90% CO₂ savings on manufacturing and distributing certain industrial components, while also returning jobs to the United States. These jobs are not captured by the study and represent additional upside job creation.
- **Major Reduction in Gas Flaring:** In addition to CO₂ reductions, one of the largest industrial efficiency opportunities would be capturing flare gas. At 2019's run rate, flaring 15bcm in the US would incur \$1.5bn pa of penalties at \$50/ton, worsening OPEX for heavy flarers by c\$1.3/bbl vs. light flarers. A \$90/ton CO₂ price could potentially eliminate US gas flaring.



Fig 1. Technologies could eliminate over 5bn tons of CO₂ emissions from the US energy system, with incentive prices ranging from zero to \$750/ton

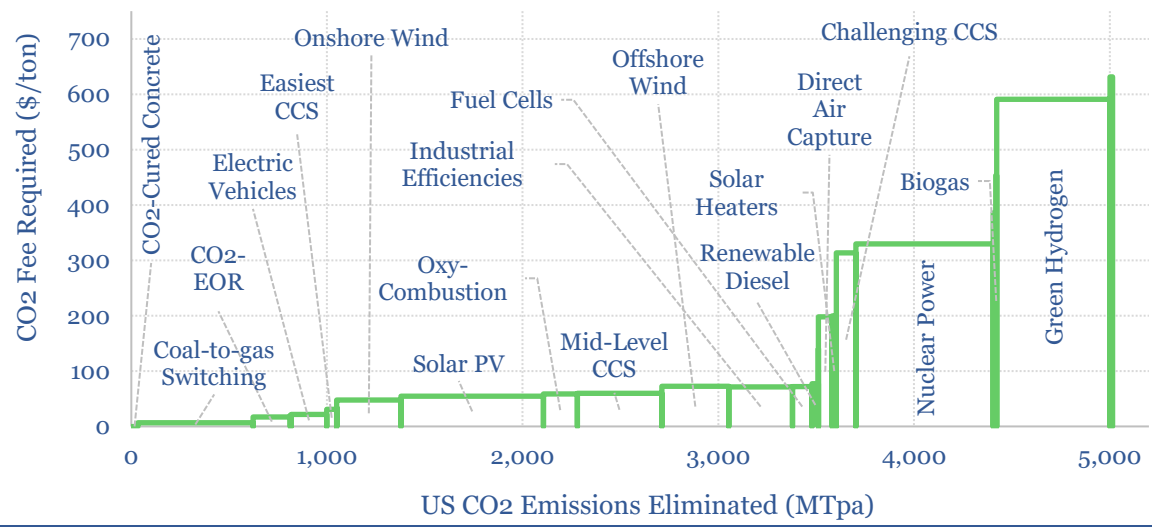


Fig 2. Purely by implementing the CLC's CO₂ fee, the US could reduce its emissions 57% by 2035

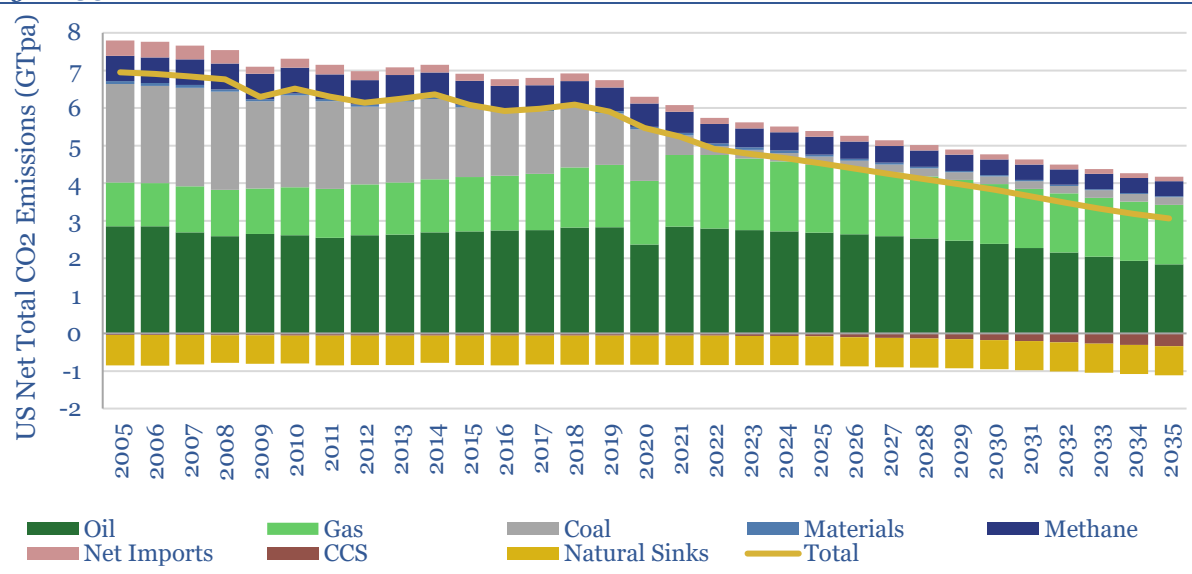


Fig 3. Incremental annual investments escalate over time, with an initial surge to \$95bn in 2023, rising to \$100bn in 2030 and \$130bn in 2035

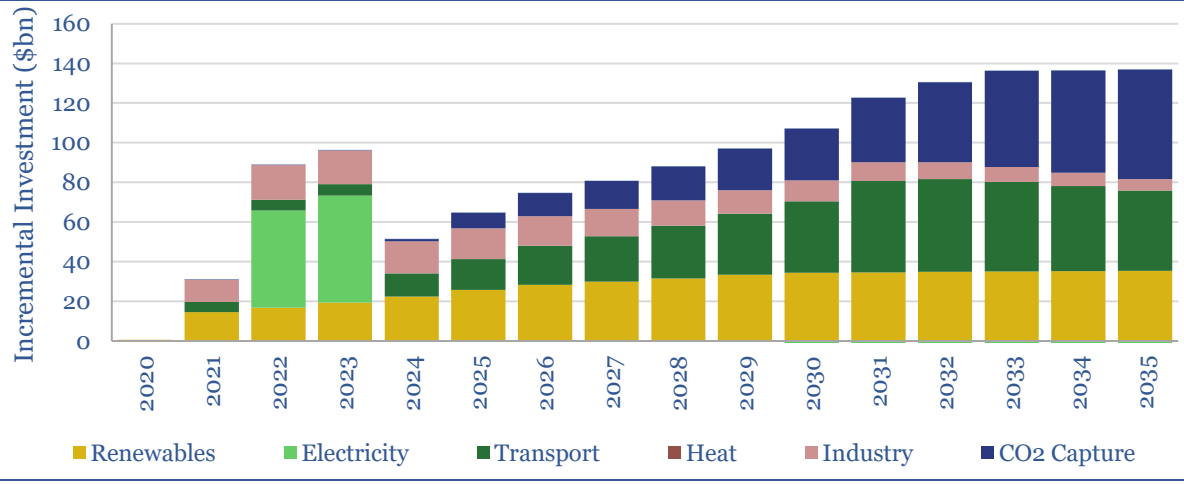




Fig 4. 195,000 direct, incremental jobs would be created in 2023, in an initial investment surge, while long-term job creation ramps up gradually to 255,00 jobs by 2035

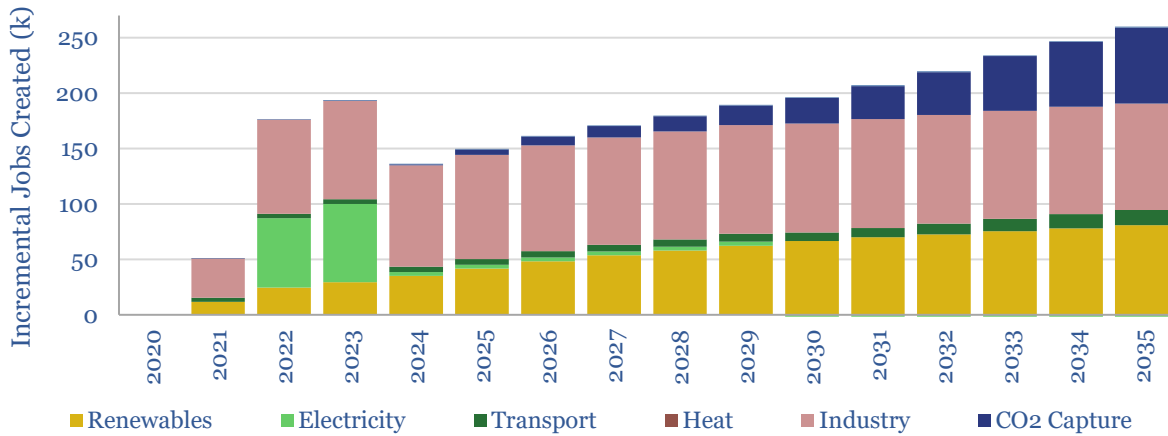


Fig 5. CO₂ prices help renewables rise from 10% to 30% of the US grid

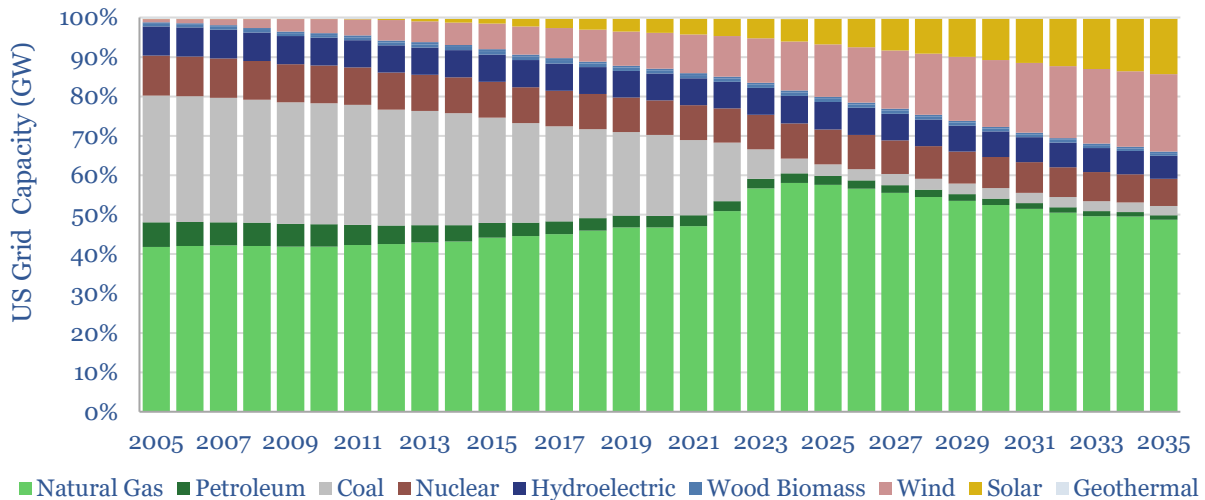
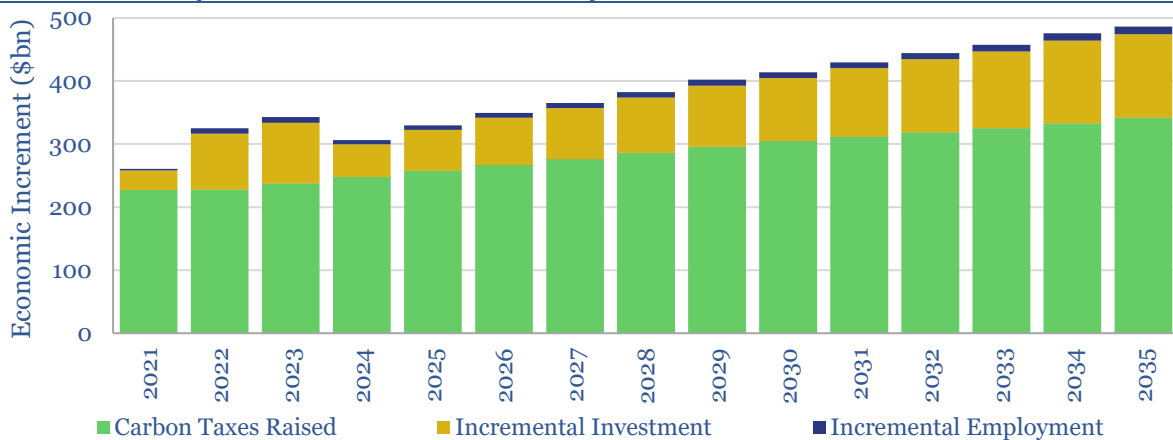


Fig 6. Gross CO₂ fee revenues could escalate from \$230bn in 2021 to \$340bn in 2035



***About Thunder Said Energy**

Thunder Said Energy (TSE) is a leading research consultancy focusing on energy technologies and the energy transition, founded in 2019 by top-ranked Wall Street energy analyst Rob West CFA. The firm identifies and models the most economic opportunities to decarbonize the world, including rankings of technologies, cost estimates and market forecasts. TSE's research library contains 300 research notes and data-files, based on over 1,000 technical papers and over 1 million patents.