

Clean Investment Monitor: Q4 2024 Update

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Authors:

Lily Bermel
E. Chan
Ryan Cummings
Brian Deese
Michael Delgado
Leandra English
Yeric Garcia
Hannah Hess
Trevor Houser
Charlotte McClintock
Anna Pasnau
Harold Tavarez

Summary

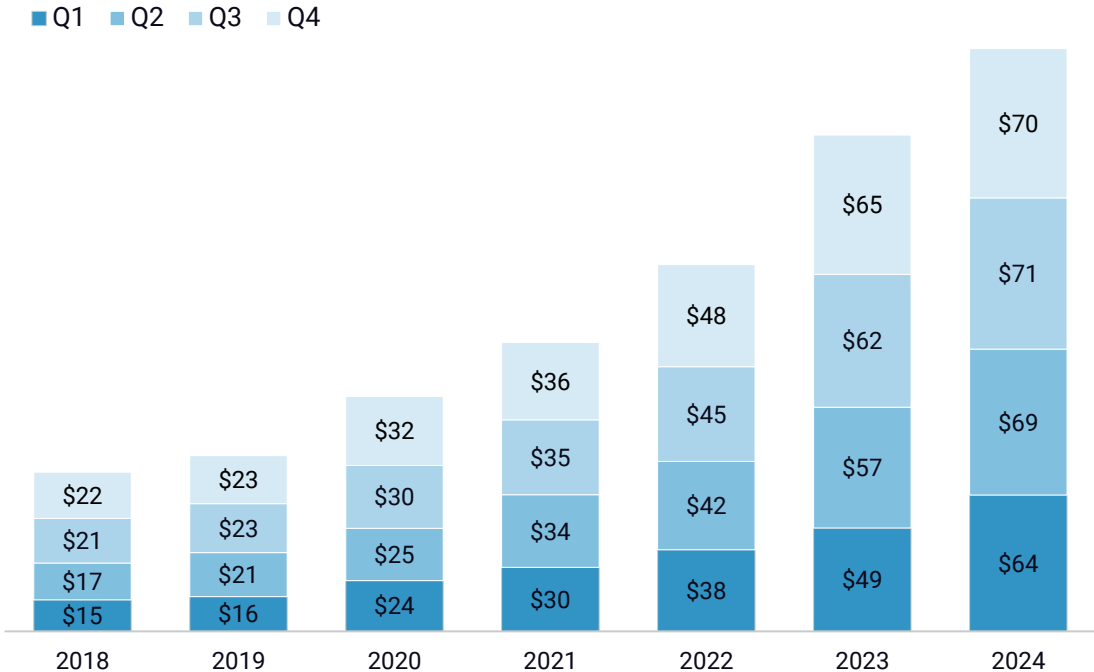
In the final quarter of 2024, clean energy and transportation investment in the United States totaled \$70 billion, reflecting a slight 1% decline from the previous quarter but a 6% increase from the same period in 2023. Total clean investment in 2024 reached \$272 billion, a 16% increase above 2023. While this broadly signals continued growth, it also reflects a deceleration from the previous streak of quarter-on-quarter increases. Clean investment accounted for 4.9% of total US private investment in structures, equipment, and durable consumer goods in Q4 2024, compared to 4.7% in Q4 2023 and essentially flat from last quarter.

Consumer purchases and installations of \$36 billion of clean technology, tracked in our retail segment, were the primary drivers of investment. Retail investment grew by 4% relative to the previous quarter, while investments in manufacturing projects, utility-scale clean electricity, and industrial decarbonization technologies experienced quarter-on-quarter declines. Relative to the same quarter in 2023, retail investment increased by 15% and manufacturing investment was up a notable 37%, while clean energy and industrial investments fell by 20%.

This report provides a snapshot of clean technology and infrastructure investments during the final full quarter of 2024—a period that spanned the end of the US campaign season, the election, and efforts to finalize tax credit guidance and commit federal grants and loans appropriated in major climate legislation. These investments occurred before any policy changes in 2025. In addition to highlighting key trends from our Q4 2024 update to the [**Clean Investment Monitor database**](#), we present a breakdown of the past 2.5 years of clean investments mapped to the congressional district boundaries in effect for the 119th Congress.

Since Q3 2022 through the end of 2024, there has been \$289 billion invested in the construction and installation of facilities that manufacture or deploy clean technologies. Our tracking of these projects shows districts currently represented by Republicans benefitted from \$223 billion of this investment, representing 77% of the total share, compared to \$66 billion invested in districts represented by Democrats. Looking at the pipeline of announced and under-construction projects, \$402 billion of outstanding investment could be realized in GOP districts, or 77% of the total outstanding share, compared to \$122 billion of outstanding investment in districts represented by Democrats. We provide a breakdown of investments that have occurred and outstanding investments from announced projects, as well as the total number of facilities tracked in each district.

FIGURE 1
Clean investment by quarter
Billion 2023 USD



Source: Rhodium Group/MIT-CEEPR Clean Investment Monitor

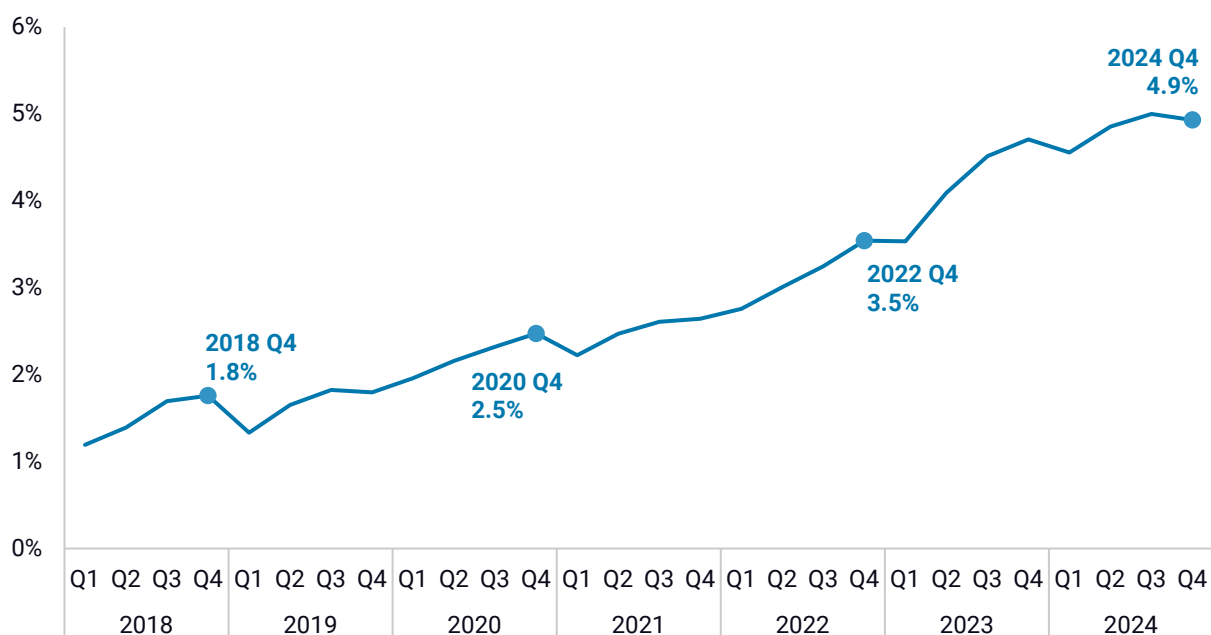
Investment trends

Actual clean energy and transportation investment in the US in Q4 2024 totaled \$70 billion, a 1% decrease from the previous quarter (Figure 1). While this marks a 6% increase from the same period in 2023, it's a deceleration and a departure from the nearly unbroken streak of quarter-on-quarter growth. This brings total clean investment in 2024 to \$272 billion, a 16% increase from 2023. In Q4 2024, clean investment accounted for 4.9% of total US private investment in structures, equipment, and durable consumer goods nationwide, down slightly from 5% in Q3 2024 but still up from 4.7% in Q4 2023 (Figure 2).

FIGURE 2

Actual clean investment as a share of total US private investment

Annualized basis, total investment in all private structures, equipment, and durable consumer goods



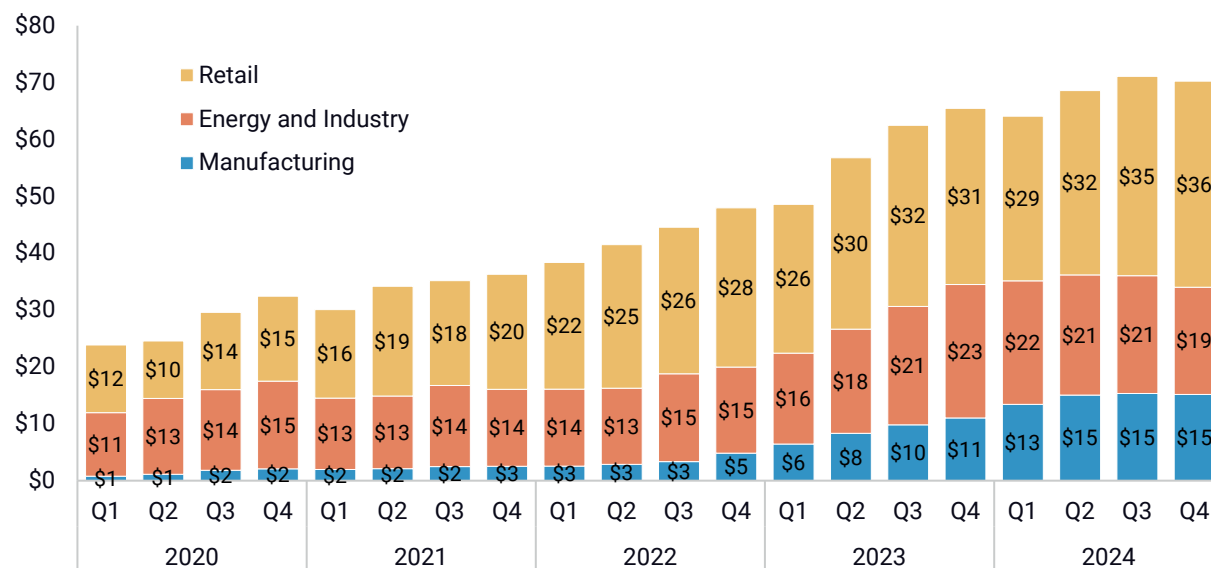
Source: Rhodium Group/MIT-CEEPR Clean Investment Monitor

We categorize our clean investment tracking into three segments: investment in the manufacture of GHG emission-reducing technology (“manufacturing”); investment in the deployment of that technology, both to produce clean energy or decarbonize industrial production (“energy & industry”); and investment through the purchase and installation of that technology by individual households and businesses (“retail”). Each dollar figure in this report reflects actual investment—the real dollars spent in the given quarter on retail purchases, facility construction, and equipment purchase and installation. For facilities, we track actual capital expenditures invested over the reported (or estimated) timeline of construction once we confirm an announced project has broken ground. In the following sections of this report, we summarize announced investments to provide context and insight into potential future actual investments.

By segment, retail investment again drove the quarter’s clean investment growth, accounting for 51% of total clean investment in Q4 at \$36 billion. Actual retail investment increased 4% relative to the previous quarter and was up 15% relative to Q4 2023. In the energy & industry segment, there was \$19 billion in new investment in clean energy production and industrial decarbonization in Q4 2024, slipping 9% quarter-on-quarter and down 20% compared to the same period last year. Manufacturing investment declined 1% from Q3 2024 with \$15 billion of new investment but was still up 37% from Q4 2023.

For the full year of 2024, retail investment totaled \$131 billion, a 9% increase relative to 2023. Investment in the energy & industry segment climbed to \$82 billion, up 5% compared to 2023. Manufacturing investment totaled \$59 billion in 2024, up by 66% from 2023.

FIGURE 3
Actual clean investment by segment
 Billion 2023 USD

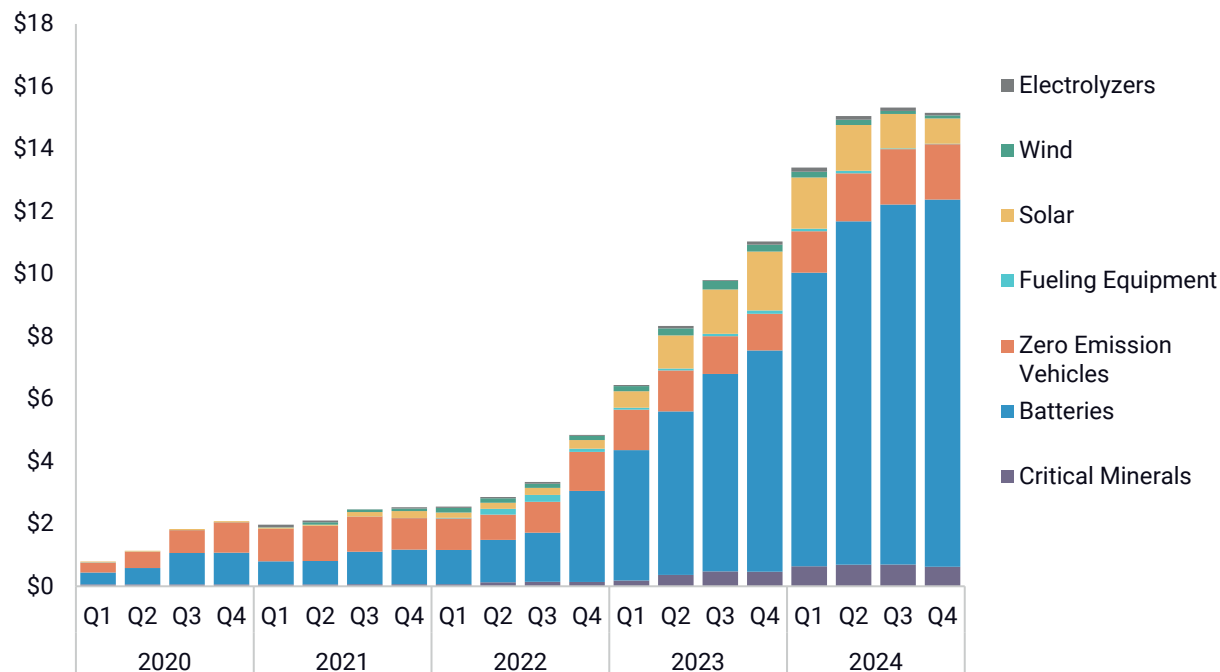


Source: Rhodium Group/MIT-CEEPR Clean Investment Monitor

Manufacturing

The electric vehicle (EV) supply chain—critical minerals, batteries, vehicle assembly, and charging equipment—continued to dominate clean manufacturing investment in Q4, at \$14 billion (93%) of the total \$15 billion in actual investment (Figure 4). Investment in the EV supply chain was up 79% in 2024 relative to 2023, reflecting sustained momentum in the sector. Battery manufacturing investment increased by 2% quarter-on-quarter to \$12 billion, marking a 91% year-over-year increase from 2023. Solar manufacturing investment decreased by 24% quarter-on-quarter from \$1.2 billion in Q3 2024 to \$935 million in Q4 2024. Despite four quarters of consistent decline, solar manufacturing investment in 2024 as a whole was 8% higher at \$5.5 billion than the \$5.1 billion invested in 2023.

FIGURE 4
Manufacturing investment by technology
 Billion 2023 USD



Source: Rhodium Group/MIT-CEEPR Clean Investment Monitor

The pipeline of new clean energy and transportation manufacturing investment—measured by new announcements in manufacturing projects—stayed flat quarter-on-quarter at \$6 billion but is down 67% from Q4 2023. Full-year 2024 clean manufacturing announcements reached \$31 billion, down 51% from 2023. Most Q4 announcements (77%) were in battery manufacturing.

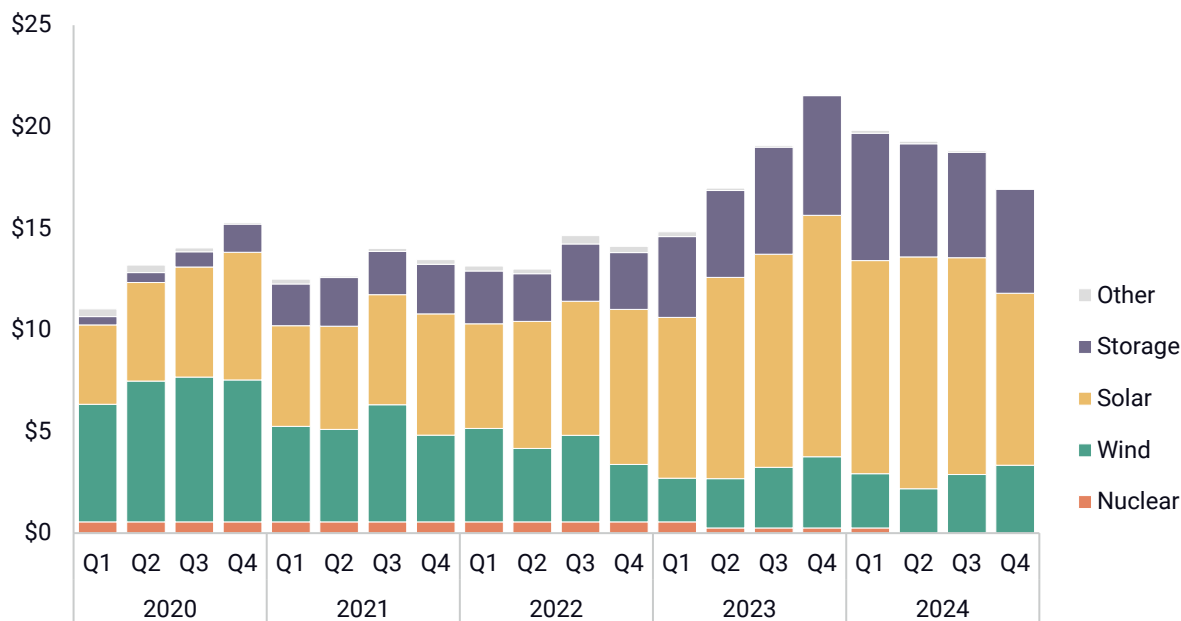
Energy & industry

The last quarter of 2024 saw a total of \$19 billion in new actual investment in clean energy production and industrial decarbonization, down 9% quarter-on-quarter and down 20% relative to the same period in 2023. Within this segment, 90% of actual investment went toward clean electricity, while the remaining 10% supported industrial decarbonization projects, a distribution consistent with previous quarters. Utility-scale solar and storage investment accounted for the majority of clean electricity investment in Q4 at \$14 billion, but both of these technologies recorded declines in Q4 relative to both Q3 2024 and Q4 2023 (Figure 5). Utility-scale solar investment fell by 21% in Q4, while grid-scale storage investment remained relatively flat quarter-on-quarter. Wind investment recorded a third consecutive quarterly increase, up by 16% quarter-on-quarter to \$3.3 billion in Q4.

For the full year of 2024, there was \$82 billion in actual energy & industry investment, up 5% over 2023. Investment in solar and storage posted annual gains in 2024 relative to 2023, up 2% and 14%, respectively. Annual investment in wind was flat year-on-year compared to 2023. In terms of capacity additions, 2024 saw the addition of 37 GW of new clean electricity generation, including 31 GW of utility-scale solar (up 63% from 2023), 5 GW of wind (a 26% decline from 2023), and 1 GW of nuclear capacity. Storage capacity additions totaled 11 GW, up 62% from 2023.

New investment announcements in energy & industry grew by 38% in 2024, driven by utility electricity announcements, which grew by 67% relative to 2023. Within the utility electricity sector, solar investment announcements rose by 62% in 2024, while storage saw a 73% increase and wind grew by 66%. Given significant Q4 additions to the project pipeline in the Clean Investment Monitor database, we now expect 31-42 GW of new capacity to come online in 2025, an upward revision of our previous forecast of 30-36 GW in our Q3 report.

FIGURE 5
Electric power investment by technology
 Billion 2023 USD

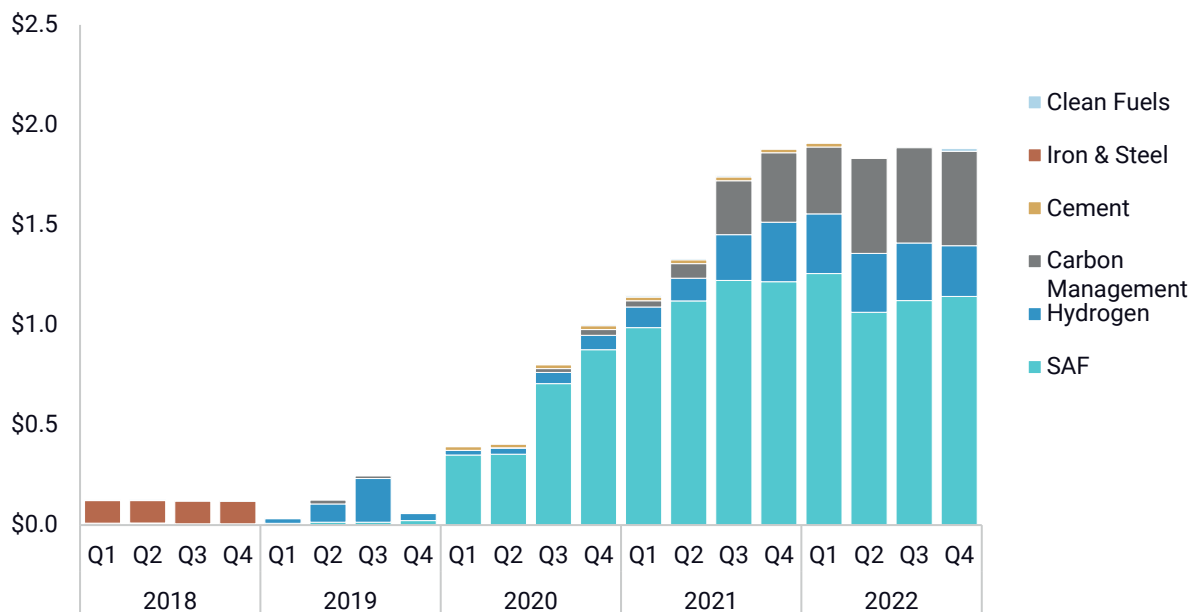


Source: Rhodium Group/MIT-CEEPR Clean Investment Monitor

Industry investment was flat quarter-on-quarter but up 23% in 2024 relative to annual investment in 2023. Within industry, the production of sustainable aviation fuel (SAF) made up 61% of investment with \$1 billion invested in Q4 2024 (Figure 6). The remainder of Q4 industry investment was split between carbon management (25%, \$472 million), hydrogen (13%, \$253 million), and clean fuels, comprised by ethanol produced with carbon capture utilization and storage (1%, \$14 million). Hydrogen was down 11% relative to the previous quarter but annual

investment in hydrogen was up 53% in 2024 compared to 2023. Carbon management was flat quarter-on-quarter but annual investments were up a substantial 144% in 2024.

FIGURE 6
Industry investment by technology
 Billion 2023 USD



Source: Rhodium Group/MIT-CEEPR Clean Investment Monitor

Industry announcements in 2024 were down 18% year-on-year compared to 2023, though Q4 industry announcements were up relative to the previous two quarters, with most of the investment announcements (79%) in SAF and some in hydrogen.

Retail

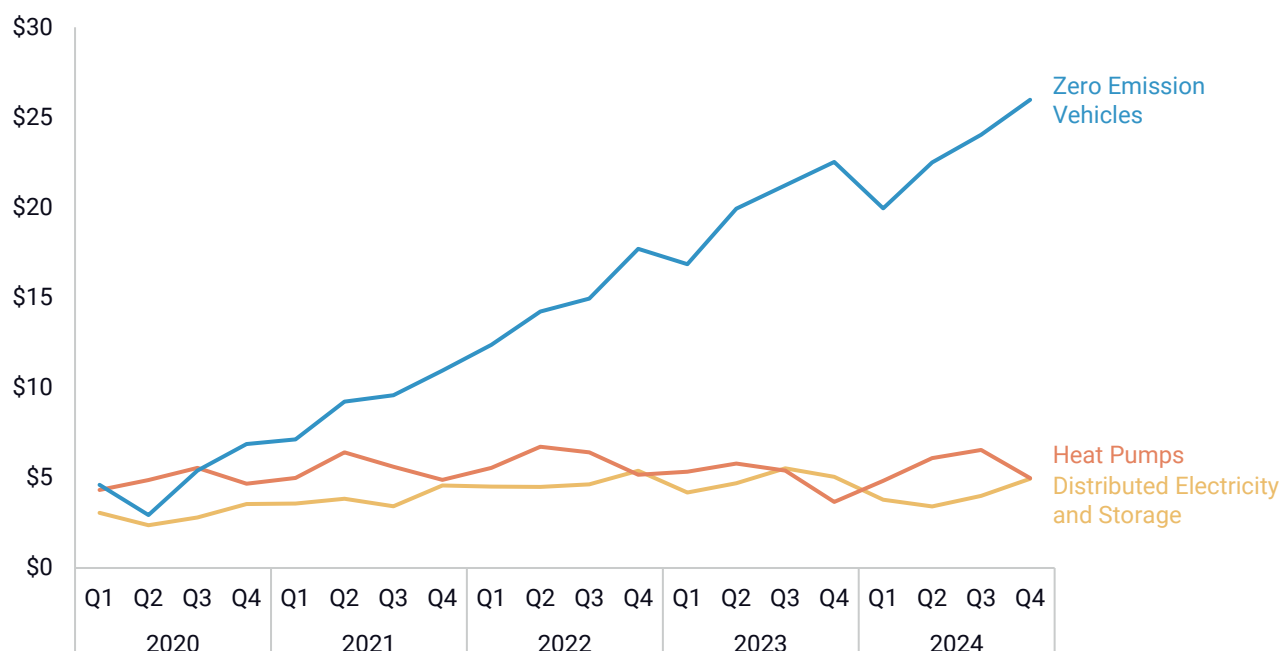
Consumer purchases of zero-emission vehicles (ZEVs), distributed renewable electricity and storage, and heat pumps came in at \$36 billion in Q4 2024, up 4% from Q3 2024. Full-year 2024 retail investment reached \$131 billion, up 9% from \$120 billion in 2023.

ZEV sales finished the year strong after declines in Q1 2024 (Figure 7). Investments corresponding to new ZEV registrations (a proxy for sales) increased by 8% in Q4 2024 compared to the previous quarter and 15% relative to Q4 2023. The growth came from both battery electric vehicles (BEVs), up 4% quarter-on-quarter, and plug-in hybrids, up 18% quarter-on-quarter. BEVs again saw substantial growth from the “Big Three” US automakers—General Motors, Ford, and Stellantis—up 25% from the previous quarter and 66% from Q4 2023. Tesla saw a small quarterly

decline in Q4, and made up less than half of BEV sales, hitting the lowest market share since our tracking began in 2018.

Distributed electricity generation and storage investment has been relatively flat for the past three years; investment increased 24% quarter-on-quarter in Q4, coming out of a mid-year lull, but was down 2% relative to the same quarter in 2023 and down 17% in 2024 compared to 2023. Heat pump investment has been similarly flat over the long run, falling by 24% quarter-on-quarter but up 36% relative to a low point in Q4 2023 and up 11% over 2023 for the year.

FIGURE 7
Retail investment by technology
 Billion 2023 USD



Source: Rhodium Group/MIT-CEEPR Clean Investment Monitor

Investment by congressional district

The Clean Investment Monitor was launched in September 2023 to provide the most comprehensive, publicly available source of information on investments in the manufacture and deployment of climate technologies, and the pipeline of outstanding investment expected to occur based on our tracking of announced projects. Clean energy has quickly ascended to one of the largest industries in the US, fueled by federal incentives included in the Inflation Reduction Act (IRA) and the Infrastructure Investment and Jobs Act (IIJA). Over the past 2.5 years, investment in the manufacture and deployment of clean energy, clean vehicles, and carbon management technologies has been announced at a record pace. However, with shifting federal leadership, uncertainty surrounds the future of

some of those policies designed to foster domestic manufacturing of clean technologies, reshore supply chains, enhance US competitiveness, and accelerate decarbonization.

Using Clean Investment Monitor tracking from Q3 2022 through Q4 2024, or July 1, 2022, through December 31, 2024, we report the sum invested so far in each district of the 119th Congress. This estimate is based on our detailed tracking of the status of more than 21,000 clean manufacturing, utility-scale clean electricity, and industrial decarbonization projects. We also report the outstanding investment that is expected to occur in each district, reflecting announced projects that are not yet completed. Additionally, we calculate outstanding investment as a share of the total value of announced projects in a district (i.e., “percent of announced value outstanding”).

Table 1 presents the top 20 congressional districts ranked by the amount invested so far, while Table 2 ranks the top 20 congressional districts by amount of outstanding investment expected for announced projects. The full dataset with all congressional districts and project counts is available [at this link](#).

TABLE 1

Top 20 congressional districts ranked by investment in projects through end of 2024

Q3 2022–Q4 2024

Congressional District	Invested (Billion 2023 USD)	Outstanding investment (Billion 2023 USD)	Percent of announced value outstanding
NC-09	\$10.46	\$5.67	35%
GA-01	\$7.91	\$0.77	9%
AZ-09	\$7.50	\$8.85	54%
CA-25	\$6.62	\$4.29	39%
NV-02	\$6.60	\$11.16	63%
TX-22	\$5.86	\$12.70	68%
GA-11	\$5.83	\$1.75	23%
KY-02	\$5.74	\$3.53	38%
TX-19	\$5.65	\$11.66	67%
CA-20	\$5.09	\$6.01	54%
TX-23	\$5.03	\$6.93	58%
TN-08	\$4.70	\$2.99	39%
GA-12	\$4.36	\$1.27	23%
TX-17	\$4.03	\$6.99	63%
MI-04	\$3.84	\$0.99	21%
KS-03	\$3.71	\$0.42	10%
OH-03	\$3.64	\$0.00	0%
TX-27	\$3.36	\$10.17	75%
WY-00	\$3.27	\$10.92	77%
CA-22	\$3.23	\$1.55	32%

Note: Excludes cancelled projects from amount already spent and amount remaining

TABLE 2

Top 20 congressional districts ranked by outstanding investment expected for announced projects

Q3 2022–Q4 2024

Congressional District	Invested (Billion 2023 USD)	Outstanding investment (Billion 2023 USD)	Percent of announced value outstanding
LA-02	\$0.24	\$20.58	99%
TX-36	\$0.69	\$16.46	96%
TX-22	\$5.86	\$12.70	68%
VA-02	\$0.61	\$12.33	95%
TX-13	\$3.12	\$11.79	79%
TX-11	\$2.62	\$11.77	82%
TX-19	\$5.65	\$11.66	67%
NV-02	\$6.60	\$11.16	63%
WY-00	\$3.27	\$10.92	77%
TX-27	\$3.36	\$10.17	75%
AZ-09	\$7.50	\$8.85	54%
IL-16	\$0.59	\$8.76	94%
TX-14	\$3.16	\$8.29	72%
UT-02	\$2.00	\$8.02	80%
OR-02	\$0.89	\$7.30	89%
TX-17	\$4.03	\$6.99	63%
NM-01	\$0.36	\$6.95	95%
TX-23	\$5.03	\$6.93	58%
TX-06	\$2.21	\$6.91	76%
IN-08	\$1.57	\$6.71	81%

Note: Excludes cancelled projects from amount already spent and amount remaining.

During the 2.5 years of spending tracked in this analysis, \$289 billion has been invested in manufacturing, clean electricity, and industrial facilities, and 2,034 new facilities have opened across the US. Of this, \$223 billion was invested in districts currently represented by Republicans, representing 77% of the total \$289 billion spent, compared to \$66 billion invested in districts represented by Democrats.

Looking ahead, there is a total of \$524 billion of outstanding investment that remains to be spent on construction and installation for announced or under-construction facilities. This pipeline includes 2,189 facilities that have yet to come online. Of this, \$402 billion in outstanding investment is expected for announced projects in Republican districts—77% of the total outstanding investment. Districts represented by Democrats are expected to see \$122 billion of outstanding investment for announced projects.

ABOUT THE CLEAN INVESTMENT MONITOR

The Clean Investment Monitor (CIM) is a joint project of Rhodium Group and MIT's Center for Energy and Environmental Policy Research. The CIM tracks public and private investments in manufacturing and deployment of climate technologies in the United States. Through this data and analysis, the CIM provides insights into investment trends, the effects of federal and state policies, and on-the-ground progress in the US towards net-zero greenhouse gas emissions.

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