

How does the Nasdaq Clean Edge Green Energy™ Index (CELS™) stand to benefit from the Inflation Reduction Act of 2022? And how should investors approach index fundamentals in today's market environment?

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Historical in scope and appeal, the Inflation Reduction Act (IRA) of 2022 addresses two issues that have been top of mind for the average consumer, the Federal Reserve and the government: record high inflation and climate change. Inflation surged to a multi-decade high in 2021¹, necessitating one of the fastest and steepest rate hike cycles in history by the Federal Reserve. With additional shocks to the economy by way of supply shortages, the coronavirus pandemic and the Russia-Ukraine war, inflation continued to surge in 2022. As much of the inflation surge stemmed from supply-side factors, contractionary monetary policy was not seen as a silver bullet for bringing inflation down. The passage of the IRA has given the average American consumer a strong reason to be optimistic about inflation reduction while the effects of monetary policy take hold.

The central focus of the IRA is bolstering American leadership in clean energy to proactively address the climate crisis. Expanding the production of clean energy and lowering its cost will naturally act as an inflation dampener, given the sharp rebound in traditional energy prices and their significant contribution to overall price levels in the economy. Beyond its focus on energy, the IRA has begun to reduce prescription drug costs, another large spending bucket for the American consumer. 5-7 million Medicare beneficiaries could see their prescription drug costs decline because of a provision in the IRA that would allow Medicare to negotiate these costs².

The IRA makes the single largest investment in clean energy in history, with the aim of reducing carbon emissions by 40% by 2030. It empowers the average consumer to actively participate in the transition to clean energy by providing powerful incentives as prescribed by the field of behavioral economics. Consumers are incentivized to buy high-efficiency appliances, purchase electric cars, and install solar roof-top panels via generous tax credits (worth up to \$7,500 for EVs). By 2030, the IRA anticipates powering homes and communities with 950 million solar panels, 120,000 wind turbines and 2,300 grid-scale battery plants through an expansion of production tax credits by \$30 billion².

The IRA has the potential to be truly game-changing, not just for its potential impact on spiraling energy costs, but also for providing incentives to create manufacturing jobs in clean energy technologies such as solar, wind, clean hydrogen, and carbon capture. Additional clauses in the bill introduce certain complexities for companies to navigate, in terms of sourcing components that are "Made in the USA" and employing workers in lower income communities. While this could delay the observed impacts of the legislation, it is broadly in keeping with other goals of the Biden administration in growing US manufacturing, broadening equity across all American workers, and strengthening US self-sufficiency in crucial areas like clean energy, semiconductors, healthcare/pharmaceuticals, and defense.

¹ <https://www.wsj.com/articles/us-inflation-june-2022-consumer-price-index-11657664129>

² <https://www.whitehouse.gov/briefing-room/statements-releases/2022/08/15/by-the-numbers-the-inflation-reduction-act/>

The IRA addresses two other issues that concern the broader public, that of the tax code and fiscal deficit. Large corporations and wealthy, high-income taxpayers will pay more in taxes. With the implementation of a 15% minimum corporate tax on income for large corporations, up to \$313 billion over 10 years in incremental tax revenue is projected³. Additionally, a better-funded IRS is expected to enforce greater tax compliance, reducing the cumulative deficit by \$124 billion over 10 years⁴. From a historical perspective, the tax increases are moderate and are unlikely to weigh on growth. This is likely to allay any concerns about negative externalities.⁵

CELS Index – Fundamentals Overview and Impact of IRA

The Nasdaq Clean Edge Green Energy Index (CELS) is designed to track the performance of companies that are primarily manufacturers, developers, distributors and/or installers of clean energy technologies, as defined by third-party research partner Clean Edge® – a leader in clean energy indexing since 2006. It includes sub-sectors such as advanced materials (e.g., silicon, lithium), energy intelligence (e.g., conservation, smart meters, LEDs), energy storage & conversion (e.g., advanced batteries, electric vehicles, fuel cells) and renewable electricity generation (e.g., solar, wind, geothermal).

The IRA is seen as a material positive for many companies that make up the Nasdaq Clean Edge Green Energy Index (CELS), as evinced by the commentary provided by management teams on recent earnings calls. Of the nearly \$400 billion in federal funding under the IRA, approximately 60% is directed towards clean energy. These funds will be delivered through a mix of tax incentives, grants, and loan guarantees⁵. Benefits are likely to accrue in 2H2023 or early 2024 by way of investment tax credits, stronger project pipelines and reduction in payback periods.

Multiple participants are expected to be beneficiaries. Enphase Energy, with an index weight of 8.2%, has indicated that it is looking to add six manufacturing lines for microinverters. First Solar, with an index weight of 7.5%, expects benefits of \$660-\$700 million from domestic manufacturing credits to flow through to the COGS line and provide a boost to the manufacture of solar modules and solar module components. Plug Power, with an index weight of 2.4%, expects the payback period of returns on its electrolyzer plant to shorten. Nextera Energy, with an index weight of 1.9%, expects new solar capacity to more than double vs. 2022 levels by the second half of this decade. As it stands, the focus is on when certain benefits will accrue rather than whether they will accrue, depending on the provision. For EV manufacturers including Tesla (index weight of 8.2%), Lucid (3.6%) and Rivian (3.3%), the impacts from higher tax credits will be more immediate and direct.

Revenue and Gross Margin Trends vs. Index Performance

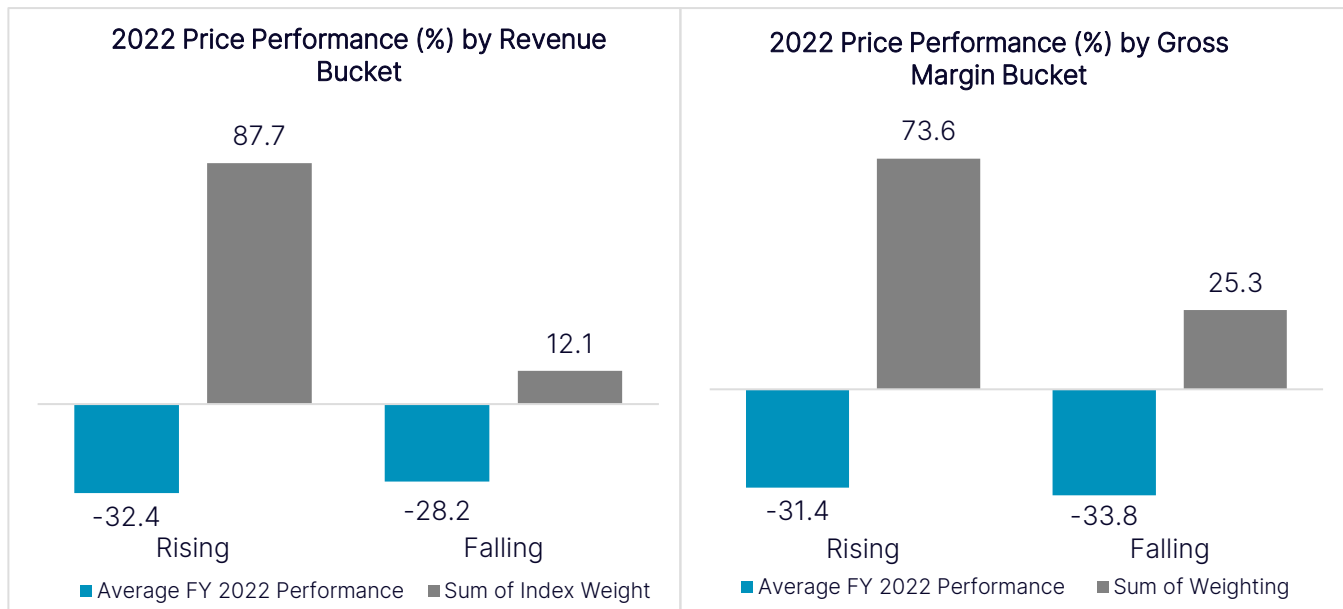
The companies that make up the CELS Index have shown significant strength in fundamentals over the past year despite a challenging macroeconomic backdrop of rising interest rates, recession fears, high inflation, and supply chain challenges. 53 out of 64 companies (representing 88% of index weight) tracked by the index saw revenues increase in 2022 vs. 2021, driven by strength in demand for electric vehicles, clean energy generation, energy storage technology including microgrids, and a broader shift towards decarbonization. Of the companies that grew revenues, 40 companies grew by double digits (by 54% on average). Of particular interest is Tesla's contribution to the increase in aggregate revenues across the index, driving about 50% of the year-over-year growth alone. It signals widespread adoption of EVs is around the corner, validating years of costly investments in R&D. The material acceleration in Tesla's recent profitability also demonstrates the importance of investor patience with certain early stage areas of disruptive technology that are positioned to succeed in massive addressable markets.

³ <https://www.crfb.org/blogs/whats-inflation-reduction-act>

⁴ <https://www.crfb.org/blogs/whats-inflation-reduction-act>

⁵ <https://www.mckinsey.com/industries/public-and-social-sector/our-insights/the-inflation-reduction-act-heres-whats-in-it>

Only seven companies saw revenues decline in 2022, representing approximately 12% of the index weight. It is encouraging that most of the index constituents posted revenue growth despite headwinds from a challenging market in China, supply chain delays and tightening financial conditions. In terms of fundamentals leading performance, companies with revenue growth in 2022 slightly underperformed, on average, companies with revenue declines. This suggests that investors are not rewarding topline growth within the index in the current market environment.



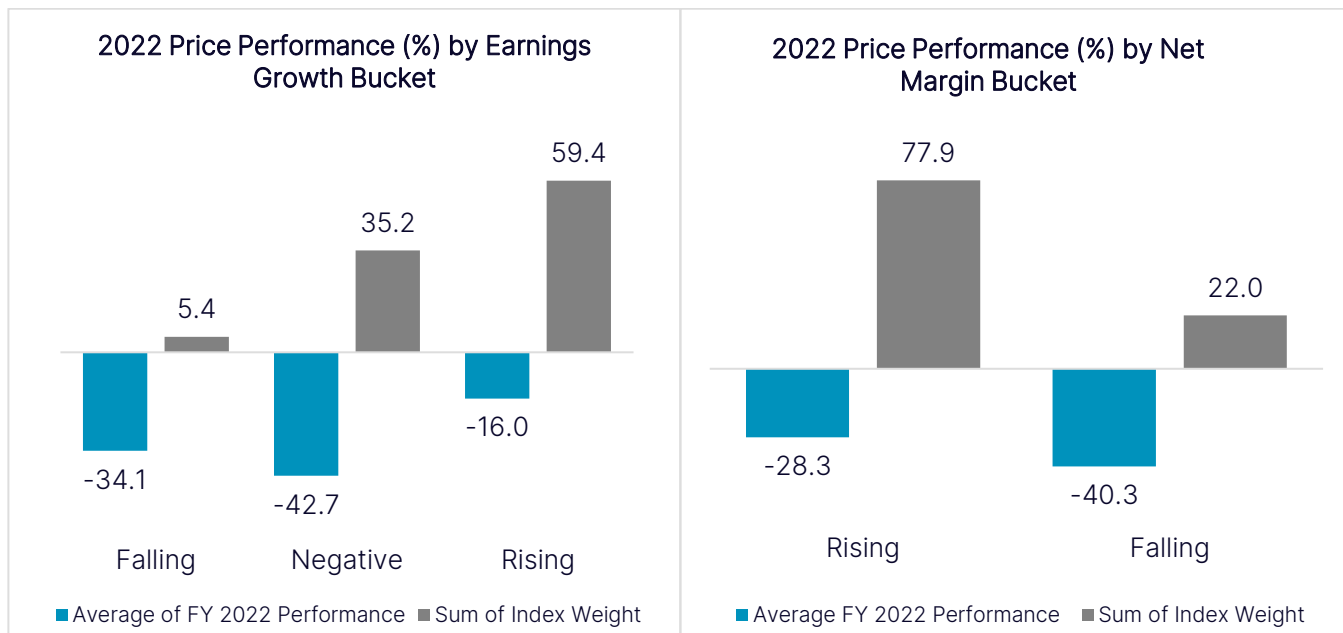
37 out of 64 companies (representing 74% of index weight) tracked by the index saw gross margins rise year-over-year due to increased efficiencies in an inflationary environment. 24 companies (representing 25% of index weight) tracked by the index saw gross margins decline due to material cost inflation, higher fixed overhead costs, supply chain challenges and logistics cost challenges. Investors should be encouraged that a large percentage of the index generated improvements in gross margins in an inflationary environment, but based on the very similar performance between the two buckets, haven't been rewarding it as such.

Earnings and Net Margin Trends vs. Index Performance

26 out of 64 companies (representing 59% of the index weight) tracked by the index saw earnings growth in 2022. These companies were able to successfully weather the headwinds from supply chain, FX, and inflation pressures from higher raw material costs, while benefitting from industry tailwinds such as unit growth in solar, EV adoption, higher energy storage penetration and improvements in cost and efficiency of renewables. Of the companies that saw their earnings increase, 17 companies (representing 39% of index weight) grew earnings by more than 100%. Tesla on its own grew earnings by approximately \$7Bn year-over-year.

35 companies (representing 35% of index weight) posted losses while 3 companies (representing 5% of index weight) saw earnings decline. Industry and company-specific headwinds such as a challenging fuel cell market in China, margin pressures, elevated hydrogen costs, state subsidy cuts, delays in EV deliveries in Europe, and higher operating expenses weighed on earnings for these companies. EV companies Rivian and Lucid are still generating substantial losses as they scale up, with recent IPOs in 2021 and 2020, respectively. These two companies alone generated combined losses of \$8Bn in 2022 vs. aggregate profits of more than \$12Bn for the index overall. One need only look at the trajectory of Tesla's earnings to get a sense of how quickly losses can become profits once a certain scale is reached in EV production.

We observed a stronger correlation between performance and earnings. Companies that posted losses underperformed the most, while companies that grew earnings outperformed by a significant margin. On average, companies that posted losses were down 42.7% on average, while companies that grew earnings were down only 16.0%. Profitable companies with falling earnings were down 34.1%.



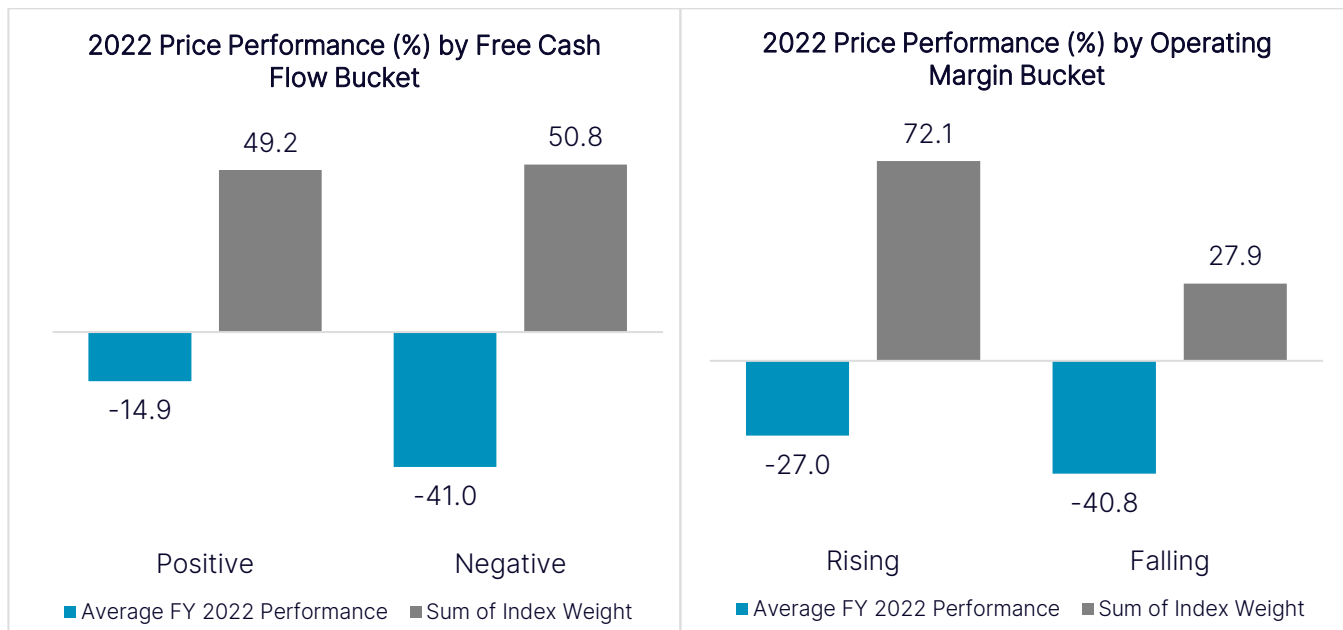
45 out of 64 companies (representing 78% of index weight) tracked by the index saw net margins rise due to a combination of strong revenue growth and cost optimization efforts with some FX gains. 17 companies (representing 22% of index weight) tracked by the index saw net margins decline.

We observed a strong correlation between performance and net margins. Companies with improving net margins outperformed companies with worsening net margins by 12 percentage points, on average.

Free Cash Flow and Operating Margin Trends vs. Index Performance

20 out of 64 companies (representing 49% of index weight) tracked by the index were free cash flow (FCF) positive due to a combination of factors including margin improvement, business cyclicity and working capital efficiency. 44 companies (representing 51% of index weight) were free cash flow negative.

We observed a strong correlation between performance and FCF. Companies that were FCF positive significantly outperformed companies that were FCF negative by 26 percentage points. On average, companies that were FCF positive were down only 14.9% in 2022 vs. companies that were FCF negative down 41.0%.

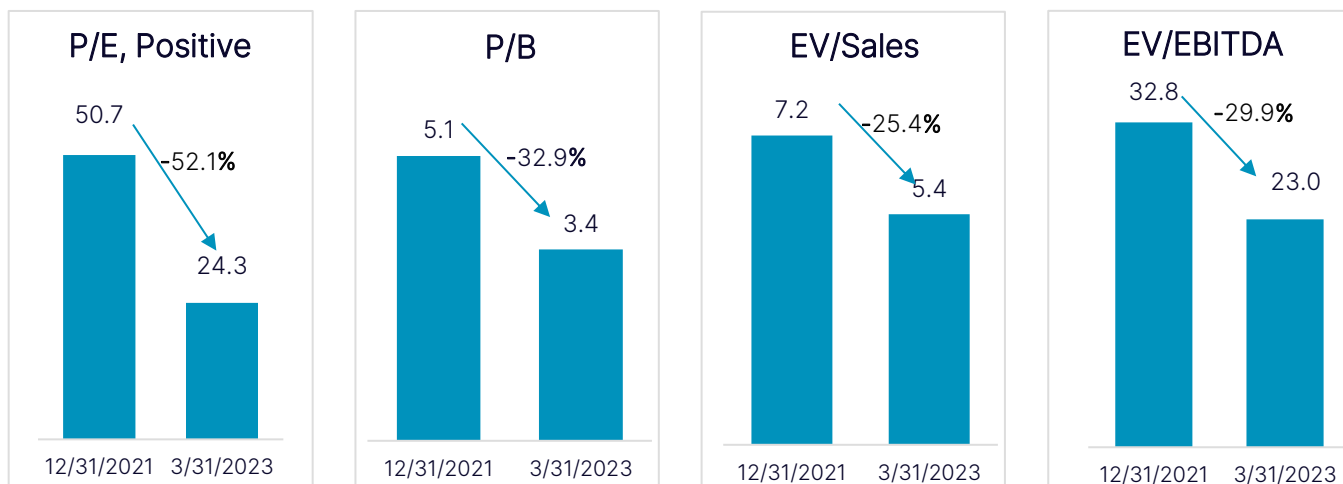


37 out of 64 companies (representing 72% of index weight) tracked by the index saw operating margins rise, largely due to price increases and cost optimization efforts. 27 companies (representing 28% of index weight) tracked by the index saw operating margins decline largely due to higher operating expenses in accounting, legal and marketing combined with acquisition-related expenses.

We observed a strong correlation between performance and operating margins. Companies with improving operating margins outperformed companies with worsening operating margins by approximately 14 percentage points.

Current Valuations vs. Year-End 2021

Over the course of 2022, the Nasdaq Clean Edge Green Energy Index became significantly cheaper on a wide variety of index-weighted valuation metrics, including price-to-earnings for positive companies (P/E, positive), price-to-book (P/B), enterprise value-to-sales (EV/Sales), and enterprise value-to-EBITDA (EV/EBITDA). Concerns around the macroeconomic environment, industry headwinds such as supply-chain challenges and company-specific headwinds weighed on valuations in 2022. Per Bloomberg, P/E for CELS companies with positive earnings recently dropped down to only 24.3, which was within the range of a broad-based benchmark like the Nasdaq-100®.



Conclusion

The accelerating transition to EVs and renewables is fundamentally changing the environment in which companies in the clean energy industry have been operating. Since 2020, EV companies and providers of battery technology have benefitted from the announcement of green recovery packages and net zero pledges in major vehicle markets. For example, growth in Europe was driven largely by tightening CO² emissions standards that were developed in 2020 and 2021. These changes lifted the market capitalization of EV manufacturers. As per a study by the International Energy Association (IEA), EV sales in Europe increased by a compound annual growth rate (CAGR) of 61%, the world's highest, above China (58%) and the United States (32%) over the period 2016–2021⁶. As per another study by Deloitte, the EV market is expected to reach a size of \$53 trillion by 2050⁷. Exposure to EV manufacturers is thus essential for any thematic index oriented around the clean energy transition.

As per another study by the IEA, renewables are expected to grow by almost 2400 GW over the period 2022–2027, which is equal to the entire installed capacity of China. Over 90% of global electricity capacity expansion over this period is expected to be driven by renewables. As with the EV landscape, there is significant policy support by way of China's 14th Five-Year Plan and market reforms, the REPowerEU plan and the IRA⁸. While there are concerns about a recession in the U.S. slowing demand for renewables, they appear to be offset by optimism surrounding a strong backlog, policy support and exposure to verticals (such as defense and telecom) that follow their own cycles independent of GDP. Undoubtedly, continued acceleration of adoption across EVs, renewables and other clean technologies seems likely over the next decade and beyond.

The fundamentals of the CELS Index are broadly strong for an industry seeing intense competition among players trying to capitalize on the rising demand for clean energy. While there remain concerns about companies that are not yet profitable (e.g., ChargePoint Holdings, Wallbox and Blink Charging), they appear to be somewhat offset by a strong demand environment and policy support. These companies could potentially be acquisition targets for players looking to strengthen their ESG efforts. Should this scenario not play out, they are likely to benefit from partnerships with industry bellwethers such as Toyota, Mercedes-Benz, and GM.

Sifting through all the noise in the recent quarters, we believe that the IRA is game-changing for the industry. What is appealing is that it supports a transition from both the demand side and the supply side, ensuring that multiple actors are involved. Public spending is likely to trigger private sector investment suggesting the start of a virtuous cycle. Over the long term, companies that make up the CELS Index are well-positioned to capitalize on the shift to clean energy.

CELS was down 30.5% for full year 2022, in-line with the Nasdaq-100 which was down 32.9%. The sensitivity of many of its early-stage growth companies to higher interest rates certainly weighed on the index. Additionally, there were sector-specific headwinds such as widespread supply chain disruptions, a downturn in the semiconductor market, extended Covid-19 shutdowns in China, and high material costs which weighed on earnings and index performance. Over the near to medium term, we are likely to see most if not all of these headwinds abate, if they haven't already. Indeed, CELS was already up nearly 11% through the first quarter of 2023 as inflation in the US was broadly recognized to have peaked, along with interest rates.

Investors looking to gain exposure to companies that provide clean energy technologies can invest in products tracking the Nasdaq Clean Edge Green Energy Index (CELS), including the First Trust Nasdaq Clean Edge Green Energy Index Fund (Nasdaq: QCLN), First Trust Nasdaq Clean Edge Green Energy UCITS ETF (Nasdaq: QCLU) and Samsung KODEX US Clean Energy Nasdaq ETF (Korea: 419420 KS).

⁶ <https://www.iea.org/reports/global-ev-outlook-2022/trends-in-electric-light-duty-vehicles#abstract>

⁷ https://www2.deloitte.com/content/dam/insights/us/articles/22869-electric-vehicles/DI_Electric-Vehicles.pdf

⁸ <https://www.iea.org/reports/renewables-2022/executive-summary>

Sources: Nasdaq Global Indexes, FactSet, Bloomberg, McKinsey, Committee for a Responsible Federal Budget

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