

Letter n°93

Why have stocks linked to the energy transition collapsed on the stock market?

(2) The loss of competitiveness of renewable energies.

"Catastrophe is what is taking its course" Walter Benjamin.

- A priori, we should have two reasons to rejoice:

Did not the recent climate summit in Dubai confirm the commitment of around 120 countries to increase renewable energy capacity from 3,400 GW in 2022 to 11,000 GW in 2030?

Moreover, in a decade, the costs of solar energy have dropped by nearly 90%, onshore wind by 65%, and offshore wind by over 50%.

- These are all reasons to celebrate an improvement in the relative competitiveness of renewable energies compared to fossil fuels. However, this overlooks the rise in interest rates, issues of unfair competition, and bureaucratic delays in the development of these energies. Thus, we find ourselves echoing Walter Benjamin's judgment placed at the beginning.
- Numerous questions arise, and we will try to address them in this Letter 93: Why has the S&P Global Clean Energy Index dropped by over 30% this year when global markets are experiencing a significant increase?

Why the substantial decrease, nearly 80% this year, in the prices of essential metals (such as lithium) for electric batteries? Why are there project abandonments or asset depreciations in wind energy? Why are companies specialized in hydrogen experiencing significant declines in the stock market? Why are many equipment producers in wind or solar energy reporting losses?

Why the decline in the price of metals essential to batteries?

The demand:

- With the energy transition, some minerals are experiencing a significant increase in demand. A wind turbine requires 10 times more rare materials to produce the same amount of electricity as a gas turbine.
- Palladium is useful for catalytic converters and semiconductors. Similarly, nickel, cobalt, and copper are essential for battery production. Let's also mention lithium, manganese, not forgetting rare earth elements. Silver is used in solar energy and electric vehicles. Platinum is useful for developing green hydrogen, especially hydrogen-powered cars.

Copper is used in solar panels, wind turbines, and electric vehicles. An electric car requires 80 to 170 kilograms of copper, which is 3 to 4 times the amount used in a gasoline car.

- China is a key player in metal consumption: 60% of the global demand for aluminum and iron ore, 50% of copper and steel...

- But the market is set to rebalance: a report from Boliden, a company active in metals, anticipates a 35-fold increase in lithium consumption, a 7 to 26-fold increase in rare earth consumption, as well as a 330% increase in cobalt needs, a 100% increase in nickel demand, and a 35% increase in copper demand in Europe by 2050.

The supply:

- Russia, the third-largest global producer of nickel and aluminium, is a key player in the supply chain, contributing 45% of the world's palladium production, 30% of global titanium production, of which 50% used by Airbus and Boeing is produced by VSMPO, 15% of platinum, 11% of aluminium, and 10% of nickel.
- Lithium: The main producers are China, Australia, and Chile (accounting for three-quarters of production alone), but Bolivia holds the largest reserves.
- Drying up of investments since 2014:

This is true for the majority of metals, and thus there are few unused capacities. For some metals, the lack of available capacities could hinder the development of renewables as mine development can take 10 to 15 years.

In the short term, dependence on China will persist as it is the main producer of rare earths, the primary lithium refiner, and, for cobalt, it controls 15 of the 18 operating mines.

Ultimately, recycling should become a major source of supply for these metals.

Price developments: a recent fall.

Why have the prices of lithium (down 80% this year), cobalt (down 45%), nickel (down 43%) and palladium (down 39%) - all essential metals for electric batteries - fallen so sharply this year?

For some metals like cobalt and nickel, the price decreases can be explained by the development of new batteries using lithium, iron, and phosphate, eliminating the need for cobalt or nickel. In the short term, Benchmark Minerals anticipates overcapacity in the three main metals: lithium, nickel, and cobalt.

- Lithium prices are now only 40% higher than the 2020 level and 15% higher than the 2021 price. The cause of this decline is the emergence of new producers outside of China, Australia, and Latin America (which alone holds more than 50% of global reserves and 1/3 of copper reserves), currently leaders in the sector. Iran has recently discovered a significant deposit, Ghana is developing its production, and the United States has made discoveries in Oregon.
- Copper: Why are copper prices stable when demand is supposed to significantly exceed supply? After reaching a high of \$10,845 per ton on 4 March 2022, the price of copper has dropped and has not varied much this year, currently at \$8,550 per ton. The cause of the price weakness is the lower Chinese demand, as China consumes 14.5 million tons, more than 50% of the world's copper production. The real estate crisis and the slowdown in growth inevitably impact demand.

Are these declines sustainable?

Nothing is less certain. With available capacities being modest, investments in new mines in recent years being moderate, and recycling developing slowly, prices will be at the mercy of temporary closures of various large mines worldwide. For example, last year, when the world's first copper mine in Chile, accounting for 10% of global supply, was temporarily closed.

Albemarle, the world's leading lithium producer, warns of a supply shortage by the end of the decade. Benchmark Minerals confirms this, as it anticipates a global demand of 3.1 million tons in 2030, which is 0.4 million tons higher than the expected supply.

According to the IMF report "Energy Transition Metals" on lithium, nickel, cobalt, and copper, the prices of the first three are expected to appreciate significantly by 2030. The global demand for copper should, according to the IFP (French Institute of Petroleum), increase from nearly 30 million tons to 100 million tons by 2050.

Prospects of overproduction in batteries and electric cars:

Five out of the top 10 battery producers globally are Chinese, competing with two South Koreans and the Japanese company Panasonic.

- The American market:

In the United States, despite subsidies of up to \$7,500 per car and a decrease in the average price from \$65,000 to \$52,000 in the last 12 months, electric car sales are capped at 100,000 per month, accounting for 8% of registrations after experiencing strong growth. One million electric vehicles sold in ten months is four times less than in China.

The goal set by Biden to have 50% of car registrations as electric vehicles by 2030 seems unrealistic, and American automakers are losing money on the vehicles sold. Consumers prefer to take advantage of cheap gasoline, GM and Ford are slowing down their investments (with respective projects of \$4 billion and \$12 billion) in this sector, and VW is delaying the construction of a fourth battery plant in the United States.

Perhaps there is a consumer desire to wait for new, cheaper models and a wish to take advantage of the \$7,500/vehicle reduction that, starting from early 2024, will no longer be deferred but immediate.

Ford's market capitalization, once exceeding \$100 billion for the first time with the announcement of an electric Mustang and an electric pickup, has fallen to \$48 billion.

- The Chinese market:

China dominates the battery market, holding a 78% market share in 2022, according to Benchmark Minerals. The majority of the factories are in China, and those located elsewhere are often Chinese subsidiaries. The production capacity reaches 90 million vehicles each year. Massive subsidies, approximately \$30 billion, have been a key factor behind this dominance.

In the production of electric vehicles, the Chinese company BYD now holds a third of the Chinese market and is expected to achieve \$4.2 billion in profits this year.

By 2030, according to Benchmark Minerals, Chinese capacity is expected to be three times higher than its local market, and the American and European markets should be self-sufficient as Europe and the United States are expanding their capacity and are expected to be able to produce nearly 20 million cars each.

Overall, according to Benchmark Minerals, if the projects are realized, the global production capacity will be almost double the demand.

Why are there issues in solar?

Certainly, the development of solar power has benefited from a 90% reduction in prices between 2009 and 2023. Indeed, global capacities in renewable energy increased by 9.6% in 2022 (with 90% allocated to solar and 9% to wind).

However, the price of polysilicones, which are essential for the production of solar panels, has increased by a factor of 3.5 since 2020.

The permit acquisition process for installing solar farms or connecting them to electrical grids can be lengthy, reaching up to 4 years in the United States.

The desire to protect against Chinese competition increases installation costs. Six out of the eight top solar cell producers in the world are Chinese, alongside one American and one South Korean.

Chinese prices are said to be 70% lower, and the U.S. government has imposed tariffs of up to 250% on Chinese solar panels.

First Solar, the leading American module producer, plans to more than double its capacities by 2026, but this may not be sufficient to meet the goals set by the Biden administration. Since 15 May, 2023, the stock price of First Solar has lost one-third of its value.

The stock price of Sunrun Inc, an American producer of photovoltaic systems and battery energy storage, has declined by 86% since January 2021.

Why are there abandonments or asset depreciations in wind energy?

Certainly, the development of wind energy has benefited from a two-thirds reduction in prices between 2009 and 2023, but companies have faced numerous setbacks:

Why has Ørsted, the Danish global leader in offshore wind, lost half of its market capitalization in recent months and 75% since the beginning of 2021? This is because the company had to make \$4 billion in provisions for abandoned projects in New Jersey.

Why has the stock price of Vestas, a major Danish wind turbine manufacturer, lost nearly 40% since its peak in January 2021?

Why did Iberdrola abandon the construction of offshore wind farms in the United States? Why is Enel, the Italian utility, reducing its renewable investments from €17 billion to €12 billion?

Why is Siemens Energy and its subsidiary, the Spanish company Gamesa, despite having a backlog of nearly €15 billion, recording losses of €4.6 billion and having to rely on €15 billion in bank guarantees?

The causes include rising interest rates, administrative delays, opposition from various groups, and competition from Chinese companies that are unfairly subsidized, effectively eliminating competition:

Five out of the top 10 wind energy equipment producers are Chinese, alongside the Danish company Vestas (ranked 2nd), Siemens, Gamesa, and Enercon.

Protective measures increase installation costs, approval delays for wind installations, up to 6 years in the United States, slow down these projects, and the lack of financing in many emerging countries forces the postponement of numerous wind energy projects.

The potential of nuclear power and the evolution of uranium prices:

Nuclear power represents only 5% of the world's primary energy, but it is present in 32 countries and provides 10% of global electricity through 445 installed reactors.

Nuclear power has many advantages:

It is a carbon-free and affordable energy that emits 70 times less CO₂ than coal.

A tripling of capacity is expected worldwide by 2050:

Since the beginning of the war in Ukraine, there has been a resurgence of nuclear programs.

According to Forumnucleaire.be, 57 nuclear power plants are under construction in 16 countries, mainly in China, Russia, and India, but also in the United States, France, Great Britain, Canada, and Japan. These orders represent 147 reactors by 2040.

In the United States, as part of the infrastructure plan, Biden plans \$6 billion for existing nuclear power plants.

In China, the first EPR was commissioned in 2018. The country, now equipped with its own technology, has decided to close its doors to reactors of Western design, and a Russo-Chinese duopoly is emerging in third and fourth-generation reactors.

In France, the EPR project has been delayed, but additional investments have been announced.

Even in Germany, there are shifts in policy. The CDU party, currently in opposition, has included nuclear power in its program.

Uranium reserves are abundant and geographically diversified:

Production is well-diversified, with 20% in Niger, 20% in Russia, 19% in Kazakhstan, 18% in Canada, and 13% in Australia. However, there have been insufficient investments in uranium mines in recent years.

Reserves are estimated at 15 million tons, with 40% in the OECD and 20% in the BRICS.

Why these setbacks in hydrogen?

- In hydrogen and fuel cells, the American company Plug Power has dropped by 94% in the stock market since its peak in January 2021 because it consumes cash but has yet to produce hydrogen.
- The European Union's goal of producing and importing 20 million tons of clean hydrogen by 2030 is unrealistic. Only 4% of the projects are funded because there is no competitive economic model, especially with the rise in interest rates.

Conclusion: *"It is not necessary to hope in order to act, nor to succeed in order to persevere"* William of Orange.

Technological constraints, political obstacles, opposition from some populist factions, administrative burdens in project approval, and financial obstacles are the hindrances to this much-needed energy transition.

Let's keep 4 points in mind:

- ***Political obstacle:*** Political resistance comes in various forms. There is first the hostility of climate skeptics, as well as that of populist leaders like Donald Trump, Bolsonaro, and others. Additionally, there are public movements fighting against measures such as banning cars in city centers. Environmental groups also contribute to public division, criticizing the wealthy for polluting excessively without paying enough.
- ***Financial constraints:*** The energy transition comes at a high cost, with the IEA estimating the necessary investments to meet 2030 goals at \$4.5 trillion per year, but actual investments do not exceed \$1.8 trillion per year.

Many projects, such as the IRA in the United States, were conceived when interest rates were low, and stakeholders expected ongoing cost reductions in solar and wind.

Now, faced with rising interest rates, inflation, and escalating implementation costs, companies are forced to abandon numerous projects and make provisions.

States, burdened with debt, must limit subsidies.

Households resist tax increases to fund the transition but will likely have to accept higher energy costs to make the transition feasible.

- ***Chinese penetration:*** Aware of prevailing protectionism, Chinese companies are establishing factories beyond their borders, but American and now European authorities are watchful.

- **Stock market disappointments:** Companies in the sector, regardless of their specialization, reached their peak in January 2021 but have since experienced substantial corrections: -94% for Plug Power Inc in hydrogen, -86% for Sunrun in photovoltaics, -78% for Sunnova Energy (a U.S. company specializing in residential solar), -75% for Orsted in offshore wind, -72% for Innergex Renewable Energy (a Quebec-based company in renewable energy production), -65% for the U.S. company Albemarle Corp, involved in lithium activities, -52% for Neoen, the French renewable energy specialist, -39% for Vestas, -33% for First Solar. Therefore, funds specializing in this theme have underperformed.

While some investors may seek to take advantage of these declines, several of these companies, such as Sunrun, Orsted, Sunnova, and Plug Power, are experiencing losses. Others, like Vestas and Innergex, have high price-to-earnings ratios.

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