

The sea change in energy markets of 2022 emerged as a more fundamental shift by year end.

Caught out by Russia's presumptive military assertion, Europe opted to accelerate decarbonisation. Across the Atlantic, the Biden administration managed to legislate spending of perhaps US\$10 trillion for infrastructure and energy assets. China, now activating its third five-year plan with an energy security focus, accelerated its renewables rollout and expanded the ambit of its ambitious innovation program for energy storage, hydrogen and a variety of energy-related technologies.

India appears to have decided that it should not – again – leave the running to China and has upgraded its targets, while Indonesia and Vietnam recently embraced US-led cash incentives to finally move on from their fossil-fuel dependencies. Notably, Indonesia has attracted stronger investment in recent years and is showing early signs of resurgence in its industrial potential, though its mineral processing strategy might yet be constrained by its carbon intensity.

As the year came to an end, the EU finally confirmed its well-rehearsed policy for a border tax (CBAM) on imported carbon content, initially to apply to steel, cement, aluminium and like products from October. US moves to engage the EU in a 'climate club' that would replace existing trade terms for steel and aluminium signal merging interests between two of three leading economic jurisdictions. The UK, Canada and Japan also are believed to be taking a keen interest. Assuming the 'club' intends to move beyond the US' current subsidy approach (and potentially to a larger CBAM), 2023 will see a large economic bloc moving toward a decarbonised trade agreement.

GLOBAL RENEWABLES INVESTMENT ACCELERATED – CHINA LEADING

Notably, the International Energy Agency's (IEA) estimate for renewables investment took a sharp upward turn. Its estimate for new installations in the next five years (as at December) is 2400GW – a 30% increase on last year's number and almost 75% increase on today's installed capacity. About half the global growth is expected to come from China – suggesting a 50% increase in its total installed renewables capacity. For reasons to follow, China may be just getting started.

2022 was the first year free of subsidy in China's renewables sector. One unusual feature of the year followed the termination of subsidy in December 2021. Usually, phased cuts in subsidy were followed by a hiatus in new investment as investors rush to capture a retiring subsidy. In 2022, the first quarter saw a flood of unusually large new renewables commitments. Two factors appear to have been at work: the latest technologies were delivering very low energy cost, and local governments became enthusiastic promoters. It appears that renewable energy is now the least cost energy source in most Chinese provinces.

Similar, but different, is the EU picture. Heavily exposed to gas, EU energy costs inevitably rocketed after Russia's supply became a liability. The effect on electricity prices was to sharply improve the position of renewables and, for the year to October 2022, average long term contract prices for new PV and wind projects were 77% below wholesale electricity prices.

TECHNOLOGY LOWERING RENEWABLE COST, SUBSIDY EXPANDING SUPPLY OPTIONS

Aside from the accelerated growth of renewables, another consequence of China's technological progress – especially with photovoltaics – is rapid expansion in hydrogen activity. While China already had a large installed hydrogen capacity, most of it was "grey",

being sourced mostly from coal. During 2022 there was a burst of new “green” hydrogen projects, most of them aiming for a commercial outcome. By year’s end, perhaps 250 projects were in some form of progress and a very large number of new developers of hydrogen electrolyzers – maybe 100 – had staked a piece of the turf.

Chasing China’s first-mover advantage, India and the US aim to diversify the global photovoltaic supply chain with about US\$25 billion of public investment over the next five years. According to the IEA, India’s production linked incentive, and US manufacturing tax credits will largely close the cost gap with China – while import tariffs and local content schemes will raise the hurdle for China exports to those markets. The result, on IEA estimates, may be a large surplus capacity in China’s PV manufacturing within five years.

On its face, 2022 shifted the energy transition from a policy debate to an execution challenge. Critically, the fossil fuel premium and public finance incentives in the biggest economies now favour renewables and renewables technologies are opening a cost advantage over fossil fuels. The prospect of CBAM and like mechanisms this year in the largest markets fills the commercial picture.

Commercial tactics are likely to be challenging in the short term, as energy prices and supply remain volatile and – in many markets – established utilities are challenged in managing disruption. Weak balance sheets in India are a risk to renewable offtakers, uncertain public policy handicaps Australia’s electricity generators, and in most markets – US, EU, China and others – regulation, planning and market constructs have become the next challenge to a higher level of investment.

A serious complicating factor in the immediate outlook is the intervention of governments. Even before Russia’s actions shook the EU’s gas dependency, there were many policy-based drivers in global energy markets. ESG factors shaping capital decisions were moving against most fossil fuel investments – and may yet limit some options in offsets in future carbon trading. In markets like Australia, policy inertia collided with faltering primary energy supply to the extent that a gas price cap was imposed by one of the world’s largest gas exporters. The EU reacted to the spike in its gas costs with a series of measures, including a notional price cap – but was saved by a combination of sharply increased US LNG exports and a mild winter season. With so many dissonant influences on what are fundamental social and economic materials, any short term view must assume a high degree of volatility.

DECARBONISATION AS A COMPETITIVE DRIVER

Even allowing for the many hurdles, energy transition may become a fundamental competitive strategy sooner rather than later.

China has leadership on some technologies aligned with energy transition. It also leads on the scale and momentum of transition. Now that the US, EU and India have made commitments to accelerate, economic competition – rather than policy – drives accelerated investment.

Disruptive change often occurs unnoticed. Analysts refer to the metaphorical “boiling frog” that does not feel the rising heat until too late. With energy transition, political, technological and consumer factors have coincided to produce momentum that suggests a watershed has passed, perhaps unnoticed.

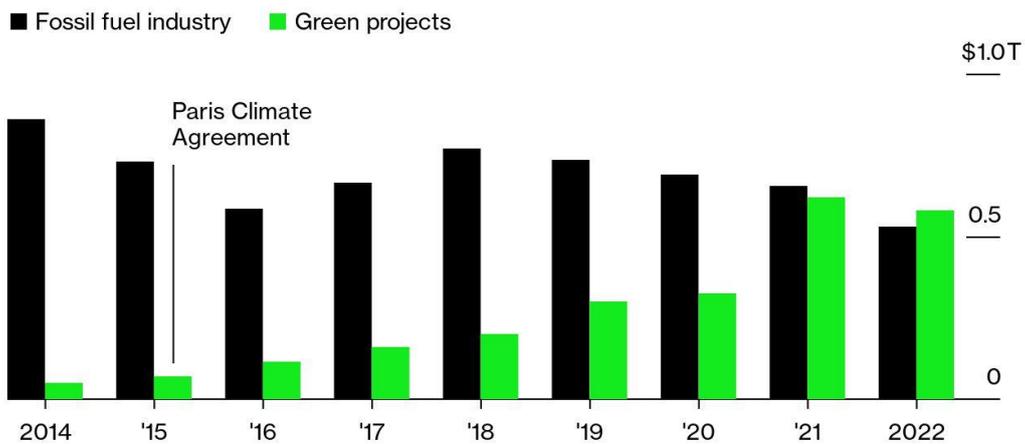
Looking back, the 1970s oil price crisis marked a fundamental change in energy use. Globally, the energy intensity of human activity – measured by its share in GDP – has fallen by between 50 and 75%. Relative to day’s dynamics, the hike from US\$2/barrel of oil to US\$15 and then US\$30 in a few short years was a simple matter.

Today's energy dynamics have three fundamental drivers. Risk of – and, increasingly, actual – profound climate effects from carbon emissions has been modifying political and investment behaviour for some years. The energy produced from renewables has come down steeply in price. And lately, scarcity of primary fossil fuels – exacerbated by the withdrawal of Russian gas supply from EU markets – has driven fossil fuel prices a long way ahead of any notional carbon price.

Putting aside the inevitable bumpiness in such a transition, it is clear that renewables are the growth asset in primary energy and coal and gas trends are clearly declining.

Green Turnabout

Green debt issuance exceeds oil, gas and coal-related financing for first time since the Paris climate announcement at the end of 2015

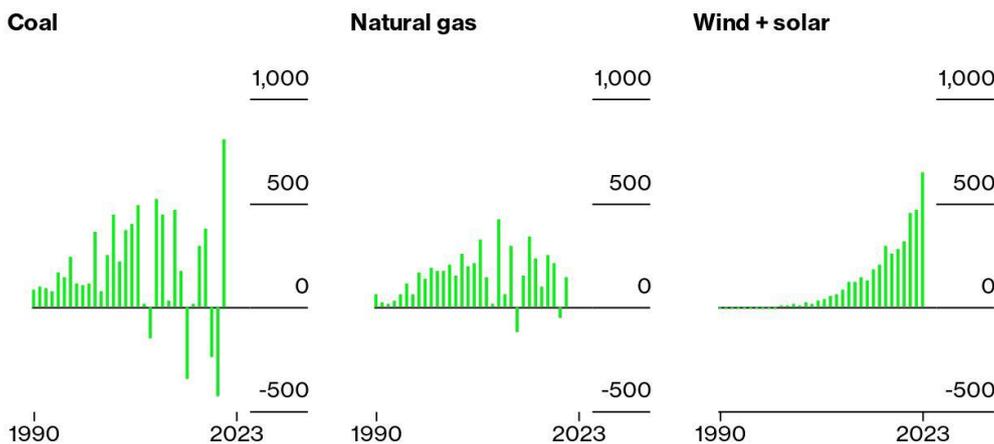


Source: Bloomberg League Tables

Bloomberg Green

Variable, Past Peak, Up and Up

Year-on-year addition in power generation by technology, terawatt-hours



Source: BP, IEA, BloombergNEF

Note: 2022 and 2023 wind and solar are estimated.

Bloomberg Green

One notable feature of the investment trends for primary energy is the smooth growth in renewables and the bumpy, largely negative trend in fossil fuel investments. Right now, China

has the momentum of at least three national five-year plans. It appears to have created the capacity to supply renewable energy at a low enough cost that most of its 250 or so hydrogen projects are “green” – 16 are already operating. Energy Iceberg has estimated that known projects would deliver over one million cubic metres of production by 2025 – five times the national target.

While the US, EU and India have shifted to an aggressive policy footing and – with others like Japan and Australia – are promoting decarbonised energy investment in Indonesia, Vietnam and parts of Africa, China is moving up the value chain.

China has strong capabilities in PV and onshore wind and is developing a variety of offshore wind technologies in large scale deployments. It is expanding its established nuclear capability and has extensive hydroelectric capacity. Its battery companies – notably CATL – are already world leaders and provide the platform for a highly competitive electric vehicle industry. This much is evident.

What is not yet evident is how well China might leverage very large scale, integrated renewable energy at low cost. It has the technology, many of the assets and is implementing the market reforms and infrastructure to do so.

Where China diverges is in strategy. Most OECD innovation is driven by risk-taking investment, often in a combination of private investment and public subsidy or tax incentives. China has had an industry strategy that began as a Soviet-styled planning model and evolved into a combination of central planning, State enterprise and local government-directed activity, bolstered in crucial ways by entrepreneurial innovation.

The strategy in evidence is one that builds on large scale, low cost renewables and dominant related technologies. We can see some narrowing, in the sense that “green” hydrogen is dominant and fuel cell transport is focused on heavy vehicles rather than cars. China has pilot projects in “green” metal processing and a range of next-generation storage technologies.

What we cannot see is the so far unknown “Ns” in China’s “1+N” policy design, being the shorthand for a policy (1) which is gradually devolved in a large number (N) of specific policy drivers.

Clearly, China has created competitive advantage by adopting a national scale implementation of next generation energy technologies. Its challenge will be to maintain that advantage as global markets emerge and evolve.

HYDROGEN: DOES THE MOUNTAIN COME TO MUHAMMAD?

China may have a more natural energy advantage if as it appears, hydrogen and ammonia are not practical replacements for LNG, oil and coal.

Rio Tinto’s chief scientist suggested recently that decarbonisation may require a fundamental change in where energy intensive industry is located. Hydrogen, which many have assumed will be produced and traded like LNG, is in fact more likely to be used at source. Similarly, ammonia – which has been suggested in Japan as a bridging energy supplement to coal – is a very expensive fuel. In both cases, hydrogen and ammonia, by product emissions are markedly higher than fossil fuel emissions.

Fundamentally, the highly energy efficient transport of fossil fuels is not presently matched in the most commonly assessed renewable alternatives.

If technology does not deliver a reliable source of transportable renewable energy for industry, it may be that a range of energy intensive industrial processes will migrate to the source of

low cost renewable energy. And, at this stage, China appears to make that opportunity its next stop on the path to a newly competitive industrial future.

Strategically, it seems likely that complex transition arrangements will emerge for the obvious reason that large, energy intensive industries are located today in jurisdictions lacking in the land and climate conditions most likely to deliver low cost renewable energy at scale. But as the larger economies move their industry toward decarbonisation it seems clear that the carbon penalty imposed on traded goods will become a substantial influence.

If businesses need to move relatively quickly to decarbonised supply chains – we can see consumer influence in products such as EVs, building materials – China’s lead on renewables may evolve as a strategic interest.

Coming out of the COVID-induced lapse in activity, China’s electricity demand jumped from about 7400 TWh in 2020 to over 8000 TWh last year. Renewables supplied over 2700 TWh of 2022 demand and the IEA expects that number to exceed 4300 TWh in five years. By comparison, US electricity demand is above 4100 TWh of which 960 TWh came from renewables last year and 1400 TWh is expected to be supplied in 2027.

Of the heavily industrialised countries, Japan and Germany have the obvious challenge with decarbonisation. Germany’s starting point is complicated by the fact that 45% of its heating comes from gas, which has become a priority substitution. Japan’s transition is burdened with the impact of Fukushima, which led to the closure of its 54 nuclear plants – of which only 9 reopened so far.

Just over half of Germany’s electricity came from renewables last year and almost 80% is expected to be met by 2027. But the target will go up as gas heating switches to electricity and other energy loads are also substituted with electricity.

Japan’s electricity demand is about 1000 TWh, of which 22% was supplied by renewables last year. The IEA expects that share to reach only 28% by 2027. In addition, Japan has heavy use of oil and gas for heating which will require transition at some point. The Japanese Government decided last month to legislate for reopening of nuclear plant that used to supply 30% of Japan’s electricity. Aside from the resistance of local governments concerned over risks, Japan needs to recover technical expertise given companies that formerly supplied the industry have largely withdrawn.

As global trading conditions, carbon pricing, offsets, acquittal and industry policy initiatives unfold, an important strategic concern will be the mobility of primary energy for industry. At this stage, it appears unlikely that commercially viable substitutes for traded fossil fuels will emerge in a timely way.

China and the US and potentially India present as potentially low cost sources of renewable energy at scale in markets with large domestic demand. Australia, Chile and MENA jurisdictions are expected to attract investment for what will be largely displaced energy intensity, shipped as raw materials for higher value processes.

Navigation of these challenges will become a challenge for companies, requiring much greater engagement with governments and multilateral architecture than most have become used to.



Michael Gill

Michael Gill is Dragoman’s Asia Director. He is the former Chief Executive Officer of the Australian Financial Review Group (1998-2011) and former Chairman of the Australian Associated Press (1999-2011). He was also the President of UNICEF Australia between 2007–2014.