**[The new energy world order](https://www.dawn.com/news/1766161/the-new-energy-world-order)**

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MODERN lifestyle would not have evolved without the widespread use of fossil fuels over the past century. The burning of coal, oil, and gas increased overall global prosperity, but their unabated greenhouse gas emissions were hardly priced in the economic growth model. And as mankind grapples with climate change in the so-called Anthropocene Age, the energy sector is decarbonising and decentralising in a fundamental shift.

There are many who still believe that the climate debate is deliberately rigged by the ‘liberal wokerati’ to project a doomsday impact of a global average temperature exceeding 1.5 degrees Celsius above pre-industrial levels (we have already hit 1.1°C). However, the energy transition is not being spearheaded by starry-eyed, tree-hugging environmentalists but by hard-core private capital. And despite the recent political pushback against ESG financing and reducing carbon footprint as a form of virtue signalling, the global clean energy space continues to attract tons of institutional capital because it now makes pure economic sense to go ‘long’ on clean energy vis-à-vis hydrocarbons.

These billions of dollars are being put to work across the value chain, including in wind and solar power as Chinese ‘economies of scale’ manufacturing drives down installation costs. Although Covid and recent supply chain constraints have marginally arrested the declining cost curve, these mainstream green asset classes are still cheaper than thermal power even without subsidies and carbon taxes. But because of their intermittent nature (the sun and wind do not always shine and blow), a reliable base load power system is also attracting investment in long-duration storage solutions, such as grid-connected batteries and green hydrogen. Research on various battery chemistries and electrolyser technologies is being boosted by massive amount of cleantech financing, and it would be bold to bet against human ingenuity figuring out a few technological breakthroughs, that are also commercially viable and scalable, sooner than later.

Another hot investment theme is demand-side management to connect various consumer-distributed energy resources (such as rooftop solar PV, home and electric vehicle batteries) to the distribution grid. A bi-directional and AI-driven digitised relationship between multiple sellers and buyers of electrons not only reduces peak load but also the quantum of investment required to upgrade the transmission infrastructure as the energy sector further ‘electrifies’. There is also now renewed focus in the West on developing a ‘circular economy’ to cut down on waste and improving energy efficiency.

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The increasing adoption of electric passenger vehicles (primarily in China and Europe, and increasingly so in the US) will significantly depress future demand for petrol and diesel and associated crude oil refining. The e-mobility sector is growing rapidly due to falling battery costs, improving technology, regulations, subsidies, an expanding charging infrastructure footprint, and more EV manufacturers entering the space. Long-haul road transportation, shipping, and aviation are, however, unlikely to be electrified, but could be decarbonised with synthetic fuels derived from green hydrogen (such as ammonia, methanol, and other sustainable molecules) if their economics, logistics and scalability issues work out.

Likewise, other ‘hard to abate’ sectors, such as steel and cement, may partially be retrofitted to burn green hydrogen instead of coal for process heat. Gas-fired boilers are increasingly being re­­p­­laced in Europe by electric heat pumps for dom­estic space heating, and building (and social) codes are being revised to improve energy conservation.

Geopolitics remains a key factor in the energy world, and increasingly so after the Russian invasion of Ukraine. For example, while it weans off its ‘addiction’ to cheap Russian gas and accelerates its energy transition, Europe is simultaneously competing against China’s dominance of critical raw materials supply chain, as well as President Biden’s massive $370 billion subsidies and tax incentive package for clean energy in the US. Re-shoring and friend-shoring, in the name of energy security and jobs creation, are also in vogue that may result in balkanising the global energy landscape through protectionism, and higher consumer prices ultimately.

While China and the US (the top two global eco­nomies and emitters) are strategically battling it out for clean energy supremacy, developing countries (including Chile, Indonesia, and Congo) that are endowed with clean metals and minerals such as lithium, copper, cobalt, nickel, manganese, and graphite, will soon rival the geopolitical importance of major oil and gas producers.

Who will dominate the emerging new energy world order remains to be seen as the fossil fuel industry pushes for curbing emissions via carbon capture and storage technologies, and against actual ‘phasing down’ of hydrocarbons to achieve the Paris Agreement goals by mid-century. Natural gas, including LNG, is likely to remain a key ‘transition fuel’ for the foreseeable future, albeit with increasingly stringent regulations on methane leakage. Traditional oil and gas companies that are not least cost producers, or do not stick to their core competencies, will be pushed aside by energy upstarts just like Tesla, Amazon, and Netflix upstaged the incumbents in their respective industries.

The availability and cost of climate finance required to achieve a ‘just’ energy transition for developing nations is a key agenda item at this year’s COP28 climate conference. If, and when, we decide to structurally reform our energy sector with less (not more) role of the government, a fair share of this global climate capital will also gravitate towards Pakistan. With the right policy framework and minimal red tape, we could use this money to finance private projects across a wide spectrum including critical raw materials’ mining, nature-based carbon offsets, e-buses and e-rickshaws, wind and solar hybrid power, and smart grids. We need more than just ‘adaptation’ financing to deal with annual floods and heatwaves. Time is of the essence and Pakistan can choose to be an also-ran, or a leading participant, in the emerging new energy world order.

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