FOORD'S HIGH CONVICTION CALL ON THE GLOBAL ENERGY TRANSITION

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The global energy transition presents a compelling opportunity for the astute investor. Its implications extend far beyond a simplistic switch from fossil fuels to renewable energy. Instead, it invites a nuanced understanding of the complex interplay between economics, technology, geopolitics, and societal aspirations that underpin the global energy system. In this comprehensive review, Foord Singapore portfolio manager Ishreth Hassen unpacks these dynamics to identify the potential winners and losers of this momentous shift.

The catalyst of the global energy transition lies in the struggle against climate change. Sparked by the clarion call of the 2015 Paris Agreement, the race is on to temper the earth's thermostat and limit temperature rises to 1.5 degrees Celsius above pre-industrial levels. Consequently, the investment world has spurned oil and gas, particularly in the aftermath of Russia's aggression in Ukraine. In contrast, renewable energy sources such as solar, wind, hydrogen, and electric technologies have captured imaginations and markets alike.

As investors with a commitment to sustainable practices, we were captivated by the opportunities arising from this energy transition. However, to make informed investment decisions we needed a comprehensive understanding of this complex transition. In reaching our investment conclusions, we credit the global energy needs analysis conducted by Dr Scott Tinker, Professor of Geosciences at the University of Texas at Austin and the team at his nonprofit, Switch Energy Alliance. Our conclusions are intriguing.

The concept of energy density is pivotal to the global energy transition. Hydrocarbons such as coal, oil and natural gas are packed very densely with energy. Simply put, energy density is a measure of the

amount of energy stored in a given system or region of space. The energy density of hydrocarbons is far higher than that of renewables (wind and solar). This means that larger volumes of materials are needed to harness the same amount of energy from renewables compared to hydrocarbons.

The global demand for energy is intrinsically linked to rising prosperity. As countries become more affluent, they consume more energy. No primary energy source has decreased in consumption since 1965 — not even coal. Indeed, the world still consumes more coal and oil today than all the other energy sources combined. With continued population and economic growth, energy needs are poised to rise.

Wind and solar energy production is undoubtedly growing exponentially. However, context is vital. Wind and solar have been able to provide only 10% of new global energy demand in the past ten years. This is not total demand, but just the growth in energy demand. Staggeringly, this means hydrocarbons fulfilled 90% of new energy demand in the last decade.

The future trajectory of energy demand reveals stark regional disparities. Energy demand in North America and Europe has plateaued for almost four decades. However, the energy appetite in Asia and the rest of the world is burgeoning. Home to three-quarters of the world's population, these regions are experiencing rapid economic growth and increased prosperity. The energy consumption in Asia already eclipses that of Europe and North America combined.

Emerging economies are embracing coal for industrialisation, much like the developed world did in the past. Coal, being the densest and most economical source of energy, is an attractive option for rapidly developing nations such as China and India. With the largest populations globally, these two nations' coal consumption outstrips all other energy sources combined.

India now has a larger population but consumes just a quarter of the energy that China does — India’s per capita energy consumption is where China was back in 1995. It is inconceivable to us to think that India could rely on green energy alone to follow China’s path to industrialisation.

Natural gas consumption is also surging. This energy source is denser than renewables but produces fewer emissions than coal and oil. This positions natural gas as a viable transition fuel on the path to a more sustainable future.

Energy security is another critical factor in the global energy transition. Large energy importers like Europe, China and India are embracing renewables and electric vehicles in a bid to reduce their dependence on imported energy. Projections suggest that 700 million electric vehicles may be on the

roads by 2040, each wielding 5,000 battery cells. That amounts to a staggering 3.5 trillion batteries needing replacement every seven years. This raises questions about the environmental impact of battery disposal and the skyrocketing costs of key materials like lithium.

Research shows that producing an electric vehicle requires eight times more metals and materials than an internal combustion engine. It takes seven times more copper to produce wind and solar energy than conventional fuels. What happens to costs if there is a shortage of copper, gold or silver — all highly conductive materials needed for 'electrification' of the world? And what about pollution? Internal combustion engines require drilling and produce emissions — but solar, wind and electric vehicles require mining and landfill disposal.

In the global geopolitical context, the energy transition presents strategic investment opportunities. Russia's domination of oil and gas production and China's control over processing supply chains for renewable materials exemplify how energy resources are intertwined with geopolitical power.

What does all this mean for the future energy mix? The supply side looks precariously positioned for the foreseeable future. Many things can go wrong, given the actors involved, yet everything must go right to meet the extremely ambitious global warming targets. Accordingly, security of low cost and incrementally cleaner energy supply will be paramount for global progress.

This calls for a more diversified and well-thought-out investment strategy than simply throwing money at green energy stocks. To us, the data suggests that the world will need to add more energy from all sources, while doing its best to reduce emissions. There will be significant environmental impacts no matter what energy source we use.

There appears to be no scenario under which global oil and gas demand or even supply can shrink in the next decade without triggering widespread turmoil. In fact, both must grow to displace reliance on coal, which is a greater carbon culprit. A shortage of oil and gas production would trigger price spikes, to the ultimate benefit of oil and gas producers (and service companies), anyway.

Oil and gas exploration spend has more than halved since 2014 on myopic misperceptions that the world can quickly transition away from these hydrocarbons. As a result, supply will be highly constrained in the coming years. It's the same for scarce electrification materials such as copper.

Prices will adjust, as they must. Consider the disruption of Russian gas supply last year. Europe's electricity costs rose to six times those in the US, despite generating more than one third of its electricity needs from wind and solar. How can the bloc remain competitive from an industrial standpoint? Clearly only the richest countries can afford this kind of transition, especially at the pace that is needed.

While the use of renewables will grow, the long-term economics of solar, wind, hydrogen, battery or electric vehicle companies remain very murky to us — just like the prospects of internet and software companies back in the late 1990s. In contrast, the economics of supply-constrained commodity producers or the service companies that provide the picks and shovels for this gigantic infrastructure buildout are very appealing.

So how is Foord positioned in this energy theme? Our strategy encompasses traditional energy firms adapting to change, as well as cutting-edge energy technologies and materials. Between traditional and new energy names, we have invested more than 15% of the Foord Global Equity Fund and nearly 15% of the multi-asset Foord International Fund in businesses that will benefit from this energy transition in one form or another. These are high-conviction calls.

Within traditional energy, we favour low-cost producers with extensive reserves, such as Occidental Petroleum and Shell. These companies will return all excess cash to shareholders and are (in our view, incorrectly) priced today as if they won't exist in seven to ten years' time. From an Environmental, Social, and Governance (ESG) standpoint, we like energy producers investing in carbon reduction and favouring gas over coal and oil, such as Woodside Energy (the largest independent gas and liquified natural gas (LNG) producer) and TotalEnergies (which invests heavily in European renewable power supply).

On the new energy side, we like materials such as copper and lithium that will be meaningfully supply constrained for the foreseeable future. Freeport-McMoRan and Livent are respectively the lowest cost copper and lithium producers globally, with impressive management teams and reserves that will last decades.

Foord also invests in companies serving the energy transition, such as TGS, which provides geospatial data for energy companies; Quanta Services, which focuses on the electrification infrastructure needed for renewables; Baker Hughes, a major player in LNG services; and Air Products, which is deeply engaged in industrial gases and green hydrogen.

Finally, gold and silver are precious metals, but also play a major role in electrification, given that they are the two most conductive elements on the planet. We have exposure to these metals through investments in Wheaton Precious Metals and Pan American Silver.

Foord's approach to investment in the energy transition is well considered. Our investment thesis is not speculative but premised on a deep understanding of the market's potential to misjudge long-

term earnings and valuations of companies involved in the energy transition. The approach is dynamic and will continue to adapt as the energy transition progresses.

In summation, the global energy transition is complex and multifaceted. For investors, understanding the intricacies of this transition is paramount. We are taking a proactive, informed and adaptive approach to investing in this theme in the Foord global funds. By investing in traditional energy companies that are adapting to change, and in new energy technologies and materials, we aim to safeguard returns for investors regardless of how the energy mix evolves.

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