WS AMATI GLOBAL INNOVATION FUND

Innovation Frontier

The Modernisation Of Electricity Infrastructure

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Our Investment Approach

The Amati Strategic Innovation Fund is a global equity portfolio aiming to capitalise on a recognised inefficiency in the way equity markets value innovation.

We strongly believe based on academic research and direct experience, that outperformance can be generated by investing in companies that are creating and benefitting from innovation.

Our approach to innovation encompasses not only the "Pioneers" (first movers in new, high growth markets who are often valued to reflect a dominant market share when the industry matures) but also the "Enablers" (the supplier of diagnostic equipment and test kits doesn't care which exciting new compound becomes a successful drug, just as long as the 'pioneers' keep researching) which can offer sufficiently attractive reward for lower risk. A third category, "Adopters", are the fast-following businesses that will adopt innovative products, services and business models which they see being successful elsewhere.

Investing for extended periods requires a high degree of faith in the invested company and this typically comes from gaining a deep understanding of the business model and competitive environment, as well as clarity regarding the strategy for growth. It is through exploring the complexity of a subject that we unlock the most lucrative insights.

Our concentrated portfolio approach means we are only looking to hold 30-40 exceptional companies from across the world. Each of these companies stands to be a significant beneficiary from one or more global **"Innovation Frontiers"**, but that benefit is yet to be fully reflected in the valuation.

The fund offers exposure to a range of **"Innovation Frontiers"** and this series of papers explores the opportunities offered by each one - this one focuses on the modernisation of electricity infrastructure.

ELECTRICITY INFRASTRUCTURE

Opportunity

The world is facing a huge step up in spending in electrical infrastructure motivated by the changing way we produce and then use energy. The pressures of climate change and the geopolitics affecting security of supply are pushing governments, companies and households to fundamentally reconsider their access to and their consumption of energy.

A brief search on Google will bring a raft of examples of countries, states and regions ramping up investment in their electrical grid infrastructure. In the last week alone:

U.K.

07/07/22

"National Grid Plc has laid out plans for a £54 billion upgrade to the electricity grid, the biggest investment since the 1950s, to connect up its growing fleet of offshore wind farms." [1]

Texas

11/07/22

"We are at a tipping point when it comes to capital investment and energy solutions" [2]

Andrew Waranch, founder, CEO and president of Spearmint Energy

Alberta

12/07/22

"Between $44 billion and $52 billion in capital investments would be needed to reach the net-zero targets set out by the federal government by 2035, said the Alberta Electrical Systems Operator (AESO)" [3]

Australia

12/07/22

"Step change': $12b plan for new electricity grid" [4]

Australian Energy Market Operator (AEMO)

Gulf States

12/07/22

"We have many plans to develop the interlinked electrical grid, which is one of the most crucial strategic projects in the Gulf" [5]

Derasat executive director Dr Hamad Al Abdulla

India

07/07/22

"Investment in renewables would need to more than double to about $30 billion-$40 billion per year for India to reach its target of 450GW by 2030" including "expansion of transmission and distribution networks" [6]

Institute for Energy Economics and Financial Analysis

ELECTRICITY INFRASTRUCTURE

Drivers of Change

Moving to a decentralised structure

When the last significant wave of infrastructure investment into power generation happened in the 1950's & '60's the grid was set up to source power for a relatively small number of very large electricity generation units - typically coal or nuclear powered. These huge units supplied power over long distances with very stable production. Energy would enter the 'transmission' network and be transported at very high voltage (typically >100 kV) to local substations where it would be stepped down to <70kV for delivery to local industrial users. For domestic and office use it is stepped down again to ~240v depending on the country.

This structure served us well until the nature of power generation began to change with the arrival of renewables. By their nature the individual wind or wave turbines, or solar sites are small compared to a large coal plant and they tend to be spread out all over the place, yet they still need to be attached to the grid in order to contribute. This means building the wireline infrastructure to physically connect them, which can be a significant cost, particularly if they are offshore. The unfortunate truth about renewables is that they are often best located in areas well away from where the energy is consumed.

When the grids were first designed the demand for power varied with the weather and the time of day (Coronation Street and a cup of tea), but supply was fairly constant except for planned maintenance. By adding power sources which are more variable (the wind doesn't always blow) we have created an additional level of complexity for grid operators, and they need to invest in order to increase the flexibility of the system and remain in control. The greater the proportion of power from variable sources, the bigger the problem. Since governments around the world committed to the Paris Agreement for carbon reduction the process has accelerated, but we are still in the early stages in many places.

While the process may appear straightforward there are complications associated with joining small generation units to the grid in terms of costs and lead times. Transmission lines were designed from the beginning to allow electricity to flow in both directions to balance and even-out the load across the network, but distribution lines typically weren't. However, some renewable sites are better suited to joining local distribution which means the regional networks need to be upgraded to allow for bi-directional flow. Residential roof-top solar units and, over time, electric vehicle (EV) battery storage will be plugged directly into the local grid, so you can imagine the increased complexity this 'Internet of Energy' brings. All this to say that grid operators need to invest.

A recent, and extremely detailed study by Princeton University assessed the capital requirements in terms of investment in renewable generation and the associated transmission under several probable scenarios. In even their least impactful scenario the US alone will need to spend an additional $210 bn by 2030 and ~$1 tn by 2050. However, in the scenario which most likely achieves the net zero targets these numbers rise to $385 bn and $2.46 tn respectively. [7]

Electrification of Everything

The drive to reduce emissions has led to a wave of investment and government support for new products such as EVs and heat pumps to replace internal combustion cars and gas heating respectively. This makes sense given that transport accounts for ~30% of GHG emissions of which around half comes from cars. Residential heating accounts for another 13% or so in developed countries. As individuals make the change to these more sustainable approaches, they take energy from the grid that used to come down a pipe. This increased demand also requires upgrading of the network. (I like to picture Scotty, the unflappable engineer from the original Star Trek shouting into his communicator “She cannae tek nae more Captain” as another 3 Teslas are plugged in).

Extreme Weather

The third significant driver of network capital investment comes from the increase in extreme weather we have witnessed over the past few years. Whether it has come from forest fires in California or freak snow storms in Texas, grid operators are being forced to upgrade aging equipment to prevent the more regular blackouts seen in many parts of the world. The causes and consequences of climate change are forcing their hands.

Geopolitics

As if the structural issues were not enough, the industry is now seeing huge political pressure to speed-up the process in an effort to avoid reliance on oil and natural gas following the Russian invasion of Ukraine. The very real threat of a global shortage of energy has lit a fire under the sector and brought a tangible urgency to the process of electrification via renewable sources.

ELECTRICITY INFRASTRUCTURE

The Innovation Cluster

Moving to a decentralised structure

With the evidence very clearly identified, our approach is then to find the companies which are structurally best positioned in this process. Here we look across the value chain which incorporates; the power generators and grid operators (utilities), machinery and component manufacturers, construction contractors, smart grid technology providers and independent facility managers - as well as the subcontractors, sub-suppliers and consultants that support the different links in the chain. The resulting group of companies we call the 'Innovation Cluster' and by digging into each segment we can assess their respective advantages and challenges. Each segment of the cluster faces different competitive dynamics, regulatory challenges and growth opportunities. By reviewing these different factors and speaking with experts from across our network we home in on the those with the most attractive reward for the risk. Here we are looking for structurally advantaged businesses with limited competition and a long potential runway for growth. Companies which meet these characteristics typically demonstrate high operating margins, have low financial leverage, and generate solid returns on capital through the cycle. Earlier stage ‘Pioneers’ may not yet have reached this level of maturity, but we look for evidence that they are on a clear path to achieve it over our 3-5 year investment horizon.

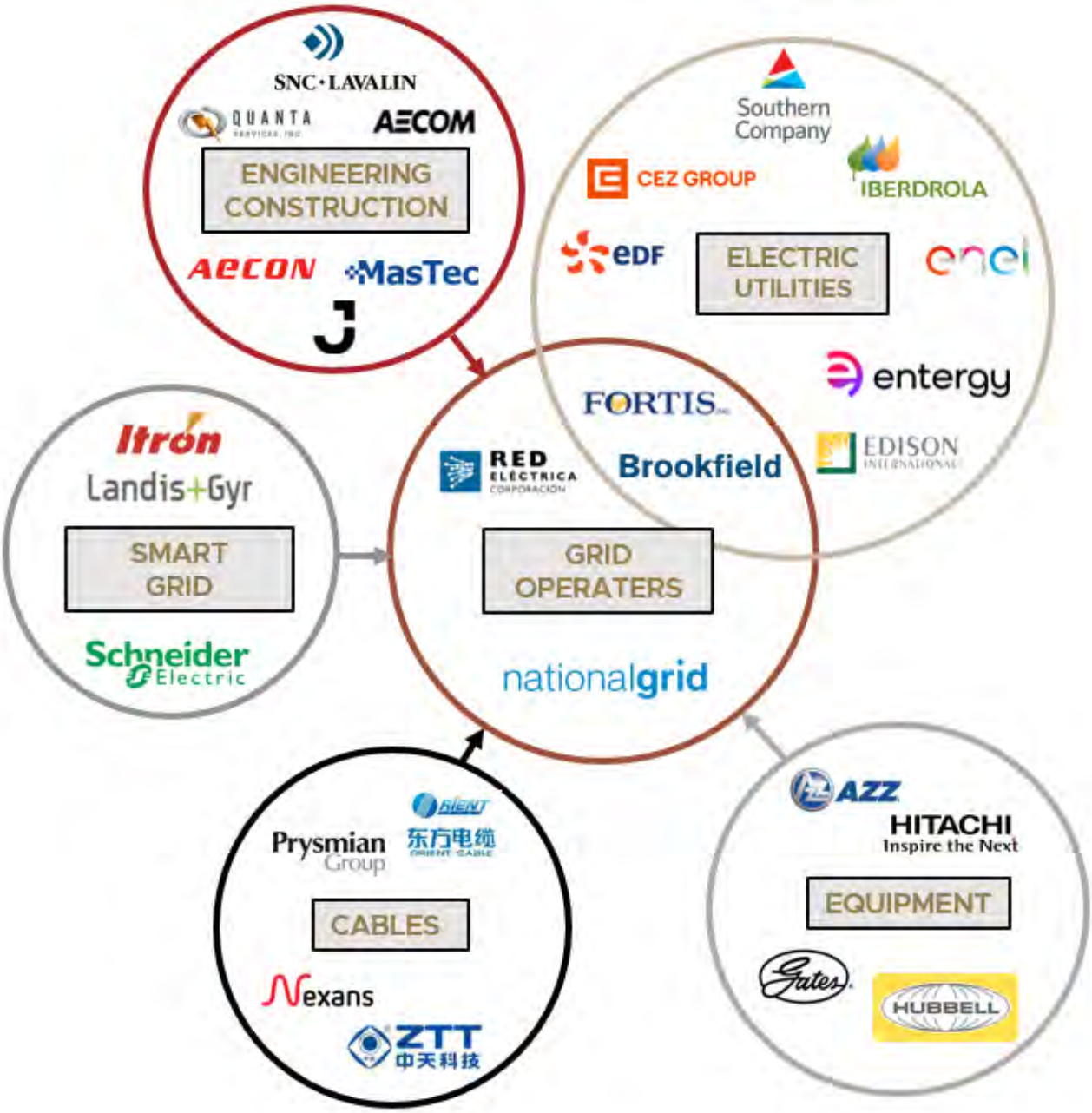
For the Electricity Infrastructure cluster, we identified the power cable producers, specialist equipment providers and companies supporting the expansion of the Internet of Energy. The cable manufacturers in particular stand out as they operate in a highly consolidated segment and their growth is skewed in the near term towards their higher margin, subsea revenues. The relatively high capital intensity and long lead times associated with new manufacturing capacity mean that barriers to entry are high. The two pure-play market leaders are Prysmian and Nexans and both offer material upside with attractive risk profiles, assuming our views on the sector are correct. With a material increase in production capacity about to come on-stream in the US, Prysmian has the edge in our view.

Among the specialist equipment providers, we again find significant consolidation and particularly identify US listed Hubbell Inc as a clear beneficiary of network expansion and hardening. Moreover, Hubbell has a strong record of using their free cash generation to further consolidate the segment and expand their reach. All three businesses are 'Enablers' in our terminology, meaning they are supporters of the Innovation leaders (known as 'Pioneers'). Companies in this cohort tend to have lower binary outcome risk than the Pioneers but benefit from the same underlying trends. Companies which are 'Adopters' of the innovative changes in the space, in this case mostly the utilities, are of less interest from an investment standpoint given the typically high levels of regulatory intervention and restricted availability of returns. Among the technology providers we have identified several businesses of interest and continue to review the opportunities. As yet we have no direct investments here.

ELECTRICITY INFRASTRUCTURE

Innovation Cluster Map

Electricity Infrastructure Modernisation



ELECTRICITY INFRASTRUCTURE

The Future

Moving to a decentralised structure

As the recent news articles suggest, many countries are only just waking up to the true extent of the infrastructure investment required to meet the goals of the Paris Accord and to respond to the already changing nature of the climatic and geopolitical conditions. Yet most of the investment plans to date fall far short of the impending requirements to meet a fully Net Zero future. As renewables continue to gain share in the provision of energy, network upgrades will be necessary just to keep the lights on.

The transition to cleaner energy sources also brings the need for an increase in energy storage through gravity, heat or chemical systems which further increases the complexity and the capital required. All of this at a time of rising inflation, already high tax and debt burdens and a cost of living squeeze. There has rarely been a time when efficiency improvements through innovation were more needed than today.

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The return on investments in overseas markets may increase or decrease as a result of exchange rate movements. There may be occasions where there is an increased risk that a position in the Fund cannot be liquidated in a timely manner and at a reasonable price. In extreme circumstances this may affect the ability of the Fund to meet redemption requests upon demand.

Citations

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