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INSIGHT

Energy transition as a means to energy security

Energy security is a pressing priority around the world given the sharp rise in energy prices that has been exacerbated by the Russian invasion of Ukraine and recent OPEC+ policies. Strengthening energy security is a key focus of governments' energy transition policies and should serve as a further accelerator of the net zero trend. We expect this to create compelling investment opportunities across the global infrastructure landscape.

by Albena Vassileva & Mandeep Mundae

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Short-term fixes temporarily unavoidable

Europe is grappling with a near-term shortage of energy sources and supplies following Russia's hostilities. In this environment, security-linked energy initiatives are aimed at identifying reliable gas supplies from "friendly" countries to reduce the dependence on Russian gas. Coined "friend-shoring", this is being achieved in the near term by building new pipelines and/or increasing LNG imports. Some recent examples include:

- new gas pipelines and LNG export terminals being developed in Norway
- renewed focus on LNG import terminals across Europe, including Germany, Netherlands, UK, Poland, and the Baltic states.

However, these are only interim measures designed to address this crucial pressure point in the existing energy system. The real focus of policymakers remains on fostering the long-term transition to clean energy sources that also contribute meaningfully to energy security.

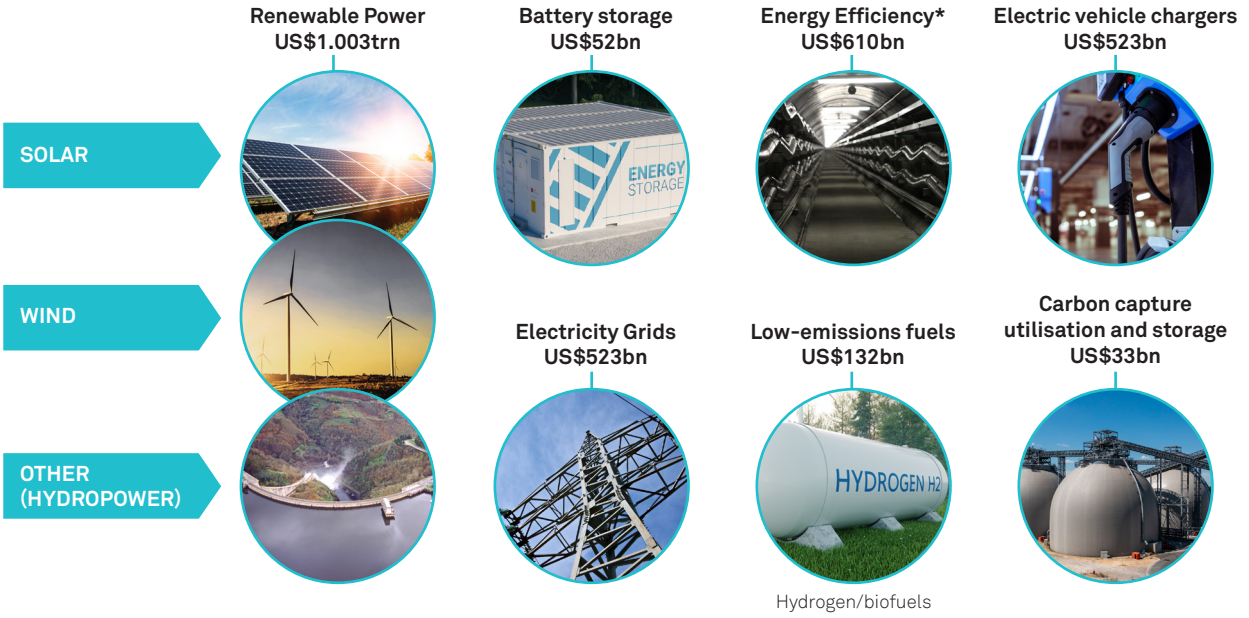
Long-term solutions are the main game

The entire energy system is expected to undergo a profound and deep transition in the next two decades. The International Energy Agency estimates the annual investment required to achieve net zero emissions by 2050 is around US$2.8 trillion over the decade to 2030. This is split across different energy sectors as shown in Figure 1.

This transition is likely to create a variety of investment opportunities across the infrastructure asset class, many of which will be inextricably linked to energy security. The key themes on which we are focusing include the trend towards reliably sourced »

FIGURE 1 GLOBAL ANNUAL INVESTMENT TO MEET NET ZERO

The transition to net-zero emissions by 2050 requires unprecedented levels of annual investment in the decade to 2030 across the energy ecosystem.



Source: International Energy Agency (2021), Net Zero by 2050, IEA, Paris
* Energy efficiency investments relate to the incremental cost of improving the energy performance of equipment relative to a conventional design

electricity to enable the electrification of industries and transport, green hydrogen to replace gas, as well as the resurgence of onshoring in developed economies, which is likely to require carbon capture technologies to deal with the near-term emissions implications.

Security and stability of electricity generation

Electrification is a key net zero trend across many infrastructure sectors, but the electricity that is required needs to be securely generated in order to increase energy security. Countries are already taking three key approaches to achieving this goal and we expect these trends to continue and, in some cases, accelerate.

1 Renewables and storage

Interest in renewable energy was already high due to climate concerns but with the recent rise in global instability, renewables are now seen as a very effective way to increase energy security. Governments globally are increasing targets for renewables in the electricity mix and promoting easier permitting at the national and local levels.

Technological advances are also speeding this trend, with an increased focus on offshore wind, which can deliver significant step changes in installed capacity and does not carry the same "visual pollution" concerns as onshore wind. Historically, offshore wind was only possible in countries with relatively shallow and stable seabeds that could securely hold the mounted turbines. More recently, floating offshore wind farms have been developed and this is enabling the more widespread use of offshore wind technology.

Further advances in battery technology will also be a significant driver of demand for renewables as a secure energy source. The sooner locally produced renewable power can be stored in significant volume, the more countries will be able to rely on it for clean electricity generation.

2 Intra-country connectivity

Electricity can only travel between countries if there is interconnectivity through cables and this is being explored and promoted by appropriate policies in Europe and globally. Connectivity enables the sharing of electricity between countries and, in conjunction with storage, provides

a reliable, fast and secure way to distribute renewable energy to where it is needed from where there is a surplus.

Whilst several neighboring markets in Europe have enjoyed interconnected grids, new projects are being implemented at a fast pace. For example, in 2021 Norway and Germany connected their electricity systems through NordLink, which – at 623 kilometres – is Europe's longest direct power link. A number of interconnector projects are underway linking the UK and Ireland, and the European Union has set a goal of at least 15% of its electricity systems to be interconnected by 2030.

3 Selective resurgence of nuclear

The analysis of local electricity generation would not be complete without touching on nuclear power which is used by some nations as a well-tested and low emissions source of base-load power.

However nuclear power is a divisive topic globally. Not all countries are in favour and many asset managers are not able to invest in nuclear-related infrastructure. This is well illustrated in Europe, where France and the UK are pro-nuclear, the Netherlands sits in the middle and Germany is largely against. Interestingly however, Germany may soften its stance temporarily due to the impact of Russia's Ukraine invasion. This suggests selective nuclear generation projects may emerge in the future, but the investment implications remain unclear.

Green hydrogen to replace natural gas

Green hydrogen[2] is only in its infancy but we believe it is a dominant theme for the future. There are strong national and EU policies aimed at developing reliable sources of green hydrogen to replace natural gas, and across the Atlantic, green hydrogen projects also featured strongly in the actions recommended by the recent US Inflation Reduction Act.

Heavy industrial activities, like steel and cement, are not easy to electrify, hence green hydrogen is seen as a viable, clean alternative to their current reliance on fossil fuels. Key chemical industries are reliant on natural gas as feedstock, which can be replaced by hydrogen.

Green hydrogen-related infrastructure, including generation, transport and storage, is potentially a significant investment opportunity as hydrogen can play a pivotal role in the net zero transition of industrialised economies such as Germany, the UK, Italy, Japan, Korea, Singapore and the US.

Not all of these countries can produce

PORTFOLIO EXAMPLE

Renewables in IFM Investors' portfolios

IFM Investors has made several renewable investments during the recent period of disruption in European energy markets. These companies offer low-cost electricity, and we also believe the increasing recognition that renewables offer greater energy security should provide a further engine for growth in clean energy capacity across Europe in the coming decades.

ERG S.p.A is a diversified European renewables platform with an established portfolio of 2.5 gigawatt (GW) across wind and solar. It has attractive growth credentials, with a near-term 3.5GW pipeline and a high calibre management team, underpinned by a 500-strong workforce with industry leading experience.

Nala Renewables is a global renewable energy platform headquartered in the UK, targeting 4GW of renewable capacity across wind, solar and battery storage by 2025. The company is targeting projects contracted to long-term power purchase agreements (PPAs) which help reduce counterparty and re-contracting risk. It also has access to proprietary deal flow through a partnership with Trafigura.

Together, ERG and Nala have more than 150 assets secured across 15 countries.

PORTFOLIO EXAMPLE

Energy security behind-the-meter

At a micro level, energy security at individual infrastructure assets can be significantly improved through behind-the-meter renewable energy programs that also contribute to reducing assets' carbon footprints. Many IFM portfolio companies are well-advanced along this pathway.

IFM portfolio companies' combined behind-the-meter capacity totaled 182.44 megawatt (MW) at end 2021, up from 160.19MW in 2020. This represents a 14% increase over the year. There is also a significant pipeline of new projects that will come on stream across our portfolios over the next five years.

Vienna Airport - A 24-megawatt peak (MWp) capacity solar farm came online at Vienna Airport in May 2022. It is expected to generate 30,000 megawatt hours of clean energy annually, which will help drive operational cost savings and reduce emissions associated with this essential asset's energy consumption.

Anglian Water - A 11.6MW capacity solar PV array came online at the company's Grafham site in late 2020. The solar array is expected to generate approximately one quarter of the site's annual energy requirements and save around 3,500 tonnes of carbon each year.

Melbourne Airport - Melbourne airport's 12MW solar farm extends across 19 hectares (approx. 26 soccer fields), making it the largest behind the meter solar farm at any Australian airport. The facility is capable of generating 17 gigawatt hours of renewable energy each year, which is equivalent to the amount of energy required to power approximately 3,600 homes.[1]

cheap, reliable green hydrogen, so many will rely on imports from "friend-shoring" countries to help ensure energy security. This suggests export projects in geographies such as Canada, US and Australia are well placed to benefit from the green hydrogen revolution.

Onshoring and carbon capture

The Covid pandemic and geopolitical tensions involving China clearly highlighted the risks associated with offshore production as supply chains came under pressure. Severe supply shortages highlighted unfavourable economic dependencies that needed to be addressed at the national level. This has prompted a resurgence of domestic industrial policies aimed at bringing production back onshore in some of the major developed economies.

A key example is the US, where there are now government incentives for local production of equipment (such as solar panels and batteries) and tax incentives that encourage businesses to source locally. These policies aim to reduce economic dependence whilst improving energy security.

In addition, the slower pace of offshoring, or even the potential return of heavy industries to developed countries, will likely increase the need for, and investment opportunities associated with, carbon capture technologies. This reflects the need to deal with the rise in emissions that results from onshoring.

Carbon capture is likely to be sought as a solution until the green hydrogen market is more fully developed, enabling these heavy industries to fully transition to the net zero world. Recent EU and US policies have been highly supportive of carbon capture, recognising its place in a realistic transition to net zero. We expect this to foster infrastructure investment opportunities, including transportation and storage of CO2, as well as distributed carbon capture models.

[1] https://www.climatecouncil.org.au/resources/watts-watt-a-guide-to-renewable-energy-capacity-and-generation/
[2] Green hydrogen is produced by splitting water into hydrogen and oxygen using renewable energy or low-carbon power. It is associated with very low emissions compared to grey or blue hydrogen that are produced using fossil fuels.

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