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INVESTING IN RENEWABLE ENERGY

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INVESTMENT TRENDS IN RENEWABLE ENERGY (RE)

With climate change at the forefront of public interest across the world, in 2015 almost all world leaders solidified their commitment to addressing the issue in the Paris Agreement. Subsequently, at least 77 countries have pledged carbon neutrality by 2050. In the private sector, rapidly changing investor appetite incentivizes even non-energy companies to make sustainability an integral consideration in their operations. In 2019, total issuance of sustainable debt surpassed \$1 trillion, as banks ramp up their exposure to this growing asset class. These factors underlie the **\$10 trillion** BloombergNEF expects to flow into clean energy by 2050, extending the exponential growth in investments seen over the past two decades (Figure 1). And thus, ESG became the next buzz word in finance. But apart from the brand equity and feel-good factor stemming from perceived good corporate social responsibility, or from direct regulatory incentives, is there an economic case to be made for institutional investments in RE? Does such case stand given the recent oil crash that has made the commodity all the more affordable? In this Focus, we explore why the answer is a resounding Yes.

Global new investment in clean energy, by region
2006 - 2019
\$bn

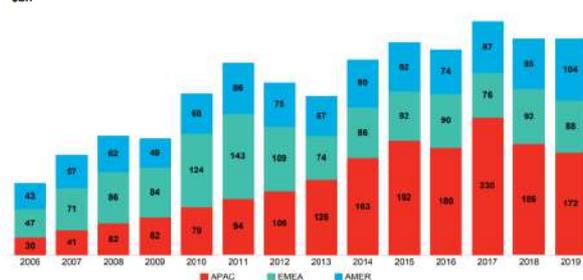


Figure 1 – Global new investment in clean energy, by region (2006 – 2019)
Source: BloombergNEF (2019)

HISTORICAL DEVELOPMENTS OF RE

The use of renewable energies was already known in the ancient history in the form of biomass to fuel fires. However, the “exploit” of renewables rose after the 1970s energy crisis as a replacement and new path against the depletion and dependence on

oil, stepping up the development of wind, solar, and geothermal energy resources. In fact, the renewables’ topic was not only a suggestion, but a must-do for the future of the earth.

The main forms of renewables which have been successful till now are solar energy and onshore wind electricity. The reason can be explained through the learning curve, which shows, over time, a drastic reduction of costs given by technology and manufacturing improvements. In fact, it was observed a learning factor of 21.5% (cost reduction) from 1976 to 2015 for solar energy, while for onshore wind electricity the rate was 12% (UCsUSA, IRENA). Nevertheless, nowadays there are yet some challenges to face as coal power is still preferred by consumers. Among the different problems, regulatory and political barriers put limits on the procedure to increase the interest of investors. The lack of infrastructure and high initial transaction financial costs discourage people from investing in renewables. Indeed, there is a common feeling of unreliability given by non-continuous and sporadic exploitation of these sources.

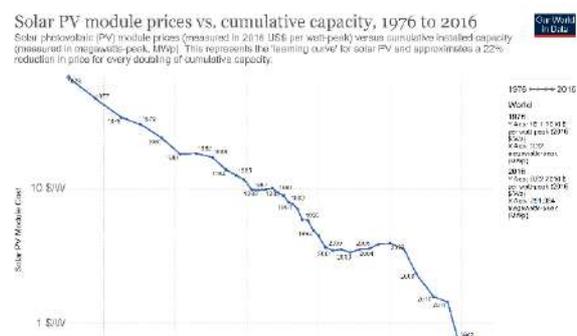


Figure 2- Solar PV module prices (1976-2016)
Source: Our World in Data

THE ECONOMIC CASE FOR RE INVESTMENTS

Demand-wise, RE growth is driven by the expansion of both the overall energy market and the RE sub-sector itself. Global energy demand is projected to grow at a 2018-2050 CAGR between 0.7-1.3%, i.e. up to 50% by 2050 (McKinsey). The IEA estimates that half of such growth will be supplied by RE. This is in turn fueled, among other things, by booming corporate commitments to long-



term RE procurement to meet their sustainability goals, most notably from big tech such as Alphabet, Microsoft, and Samsung.

Due to the sporadic nature of project development, there is no consistent trend in revenue or profit growth of the public companies in the sector. Notwithstanding, the 28 constituents of the S&P Global Clean Energy Index averaged a healthy top line CAGR of **16.73%** over the past 5 years. A similar, though more muted, upward trend is seen for net income. Going forward, we expect higher margin improvements due to economies of scale and enhanced efficiency as RE technologies mature.

With the double blow of the coronavirus and the Russia-Saudi Arabia price war causing oil prices to plummet, should we reverse our investment thesis? In short, no. Any resulting increase in demand for oil cannot be sustained even if this price level endures since the fundamental need to address climate change still stands. If anything, the event highlighted the geopolitical tensions that constantly loom over and drive uncertainty for oil investments. As such, it reinforced the momentum to move away from the volatility of this market (examples of political/market turmoil as a direct consequence of oil dependency abound) to more abundant and evenly distributed sources, such as RE. In one extreme, when oil price dipped in 2014-2016, India's government cut fossil fuel subsidies and diverted the savings to RE projects. In time, improvements in the risk-return profile of these projects will invalidate the economic case for fossil fuel investments. For more in-depth analysis of the impact of the oil crash, see our previous Focus [here](#).

“RE-PROJECT” FINANCING

We analyzed the equities that constitute the BICS Renewable Energy industry group and the S&P Global Clean Energy Index, categorized into project developers, equipment manufacturers and biofuels. The typical RE equity has a market capitalization of US\$2.1 billion, partially depicting the nascent nature of the industry. A median P/E ratio of 32 indicates high growth expectation. However, such an investment universe still omits traditional utilities who are increasingly diversifying into

renewable assets. These stocks are relatively less volatile, and could be appealing to the likes of pension funds. Corporate green bonds are more common in industries where the environment is likely core and financially relevant to the firms' operations (e.g., utilities, energy, transportation, real estate). Green bonds issuers are on average larger than other bond-issuing public firms, while they are similar based on profitability (ROA), firm value (Tobin's Q), and capital structure (leverage). Moreover, green bond issuers tend to be industry leaders in terms of environmental performance and since they are larger than other bond issuers, they are less likely to be financially constrained.

Green bonds are fixed income securities labelled 'green' as their aim is to finance specific environmental or climate-related investment. These bonds are typically asset-linked and backed by the issuing entity's balance sheet in a such way that the performance of the projects is linked to green assets to which the proceeds are allocated. In addition, they usually carry the same credit rating as their issuers' other debt obligations and offer tax incentives to attract the attention of investors. In recent years, the increasing importance of green bonds has been amplified by the growing relevance of ESG investments. The chart below shows that over the last 5 years, green bonds issuance revealed a sharp expansion all over the world.

Europe leads green bonds, while China emerges as key player

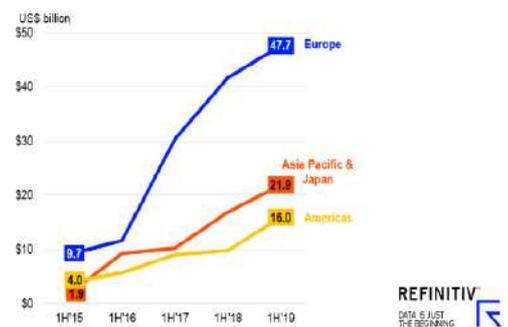


Figure 3- World growth in green bonds' issuance (US\$ billion)
Source: Refinitiv (2019)

In the table below, we show some current examples of green bond issuance related to different projects and type of issuers.

Project	Purpose	Issuer	Size	Amount
Ramset Hydropower	Low-carbon hydroelectric power	World Bank	1.957 million MW	400 \$US million
Walney Offshore Wind Farm	Offshore wind	UK Green IB	367 MW	224 GB million
Sarulla Geothermal	Geothermal Power	JBIC	321 MW	1.17 \$US billion
Jordanian solar	Solar-PV	IFC	102 MW	247 \$US million
Guaimbé and AGV solar power plants projects	Acquisition of 8 solar farms	AES Tietê	225 MW	820 BRL million

In general, another common empirical result for these companies is the capital structure: in fact, we observed a structure composed of 70% Debt and 30% equity (Diacore, 2016).

THE FUTURE OF RENEWABLE ENERGY

According to the prediction of the main research centers (for example, MITEI, IRENA) the future of solar energy looks promising and radiant. The improvements of technology will make the cost of solar energy even cheaper (by 2030 halved solar costs, say experts). In addition, it is prospected higher-efficiency levels to generate up to 1.5 times more power than existing technology. An important role will be played by systems of integration in houses and firms, as well as the development of new technologies such as super-grids, tandem silicon cells and concentrated solar power systems. Similarly, also wind energy promises a bright future. Based on the analysis of IRENA, we shall expect in the next 3 decades the average cost falling 30% by 2050 and an increase in wind turbine size for onshore applications. The level of future uncertainty is mainly driven by the deployment of innovative technologies regarding wind turbine, higher hub weights, longer blades with larger swept areas. A relevant area of development explores the potentials of floating offshore capacity to install in deeper waters.

On the other face of the coin, there are potential regulatory bottlenecks to be solved. In solar energy field, a relevant problem relates to energy storage as in many countries it is not clear whether regulated entities are in charge or not for storage costs. In fact, if they need to consider transportation costs for moving electricity to storage sites, this source of cost would be relevant and negatively impacting the profitability of the project, a significant deterrence for companies. In addition, for what concerns wind energy, possible contractions may arise from licensing and siting issues for onshore and especially for offshore sites in international waters. In the case of offshore sites, the identification of the site's location is decisive to define the regulator and hence the regulation to comply with, as well as the costs to face in pre-operational stages.

INVESTMENT RISKS

With private investments expected to provide the lion's share of the future investments needed to meet ambitious decarbonization agendas, investment risks are more pertinent than ever. While weather-related volume risk is often cited as the Achilles heel of RE, a 2011 survey by the Economist highlights *financial risk*, which mainly materializes in the early, pre-operational stages of the project and especially for small companies, as the most pressing for investors (see Figure 4).

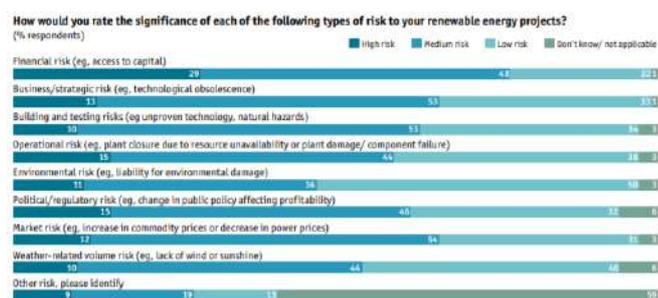


Figure 4 – RE project risk perception
Source: The Economist Intelligence Unit

This is understandable, because in contrast to investments in more traditional energy sources, most RE investments are often upfront and sizeable, with low working capital later on (Diacore, 2016). Oil & gas project cash flows, on the other hand, are relatively more stable throughout the project lifetime. Despite such characteristics, the cost of



capital for RE projects are increasingly lower relative to traditional energy sources. For example, onshore wind projects in the EU in 2014 have a WACC between 3.5% (Germany) and 12% (Greece) (Diacore, 2016), versus 9.57% for Oil & Gas and 6.71% for general utilities (Damodaran, 2014). This is partially attributed to various instruments available for risk transfer, chief among which are insurance, financial derivatives, and special purpose vehicles. Political/regulatory risk, another major source of risk, could also be mitigated via government guarantees. This method, which has decreased in popularity in developed nations/RE markets, is still essential to supporting more nascent developing markets. Taken together, these measures further improve the risk-return trade off of these investments, completing the business case for RE.

CONCLUSION

RE has come a long way since the 1970s; although social and moral incentives have also intensified, it is the economics that truly renewed investors' interest in the sector. Further advances in technology, regulatory framework, and financial market instruments will power the forward momentum, unfazed by such short-term speed-bump as the Covid-19 recession. If anything, perhaps the clearer skies from Shanghai to New Delhi will remind us of a cleaner alternative way.

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