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INFRASTRUCTURE
RENEWABLE ENERGY FUNDS: A 100% LOW CARBON ALLOCATION

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The infrastructure market can be divided into four major categories: transportation infrastructure, energy infrastructure, telecommunications infrastructure, and public services infrastructure.

In a context of low rates and stock market volatility, investors' interest in infrastructure is increasing:[1] around 2% of institutional investors are represented in this asset class, which is also particularly popular among insurers.
The expected yields in infrastructure debt range between 3.5% and 6% net, varying according to the nature of the project and market conditions. In terms of equity, investing equity in a 'brownfield' transaction (i.e. the buying or refinancing of an existing piece of infrastructure) can yield around 5% to 10%, depending on the underlying risk and leverage effect. In a 'greenfield' transaction (i.e. construction financing), the expected yields are higher.

For this asset class, as for others, **taking part in the energy transition means both (i) consuming less energy and (ii) better producing such energy.**

1. As of the end of March 2014, European infrastructure funds held $87 billion under management.

A distinction may thus be made between, on the one hand, general infrastructure projects that benefit from ambitious energy performance contracts, and, on the other hand, natural and renewable energy undertakings that contribute directly to the objective of 'decarbonising' the world's energy mix.

As concerns the first category, the market reality is that measures of energy performance are still too heterogeneous. While efforts are being made and various initiatives have been launched, these do not yet enable robust, comprehensive and widely comparable evaluations of their energy impact.

Thus, in the world of infrastructure, better energy production via renewable energy funds offers an adequate toolset for investors wishing to allocate their capital in projects that respond to the issues of the energy transition. While their carbon impact is undeniable, do such funds constitute an attractive alternative investment?

1 | Renewables worldwide: 9.1% of electricity production

World supplemental electricity generating capacity from natural and renewable sources grew by **103 GW** in 2014, a figure which represents half of all net supplemental power worldwide.
In particular, 49 GW of wind-turbine capacity and 46 GW of solar photovoltaic capacity were added to the global energy matrix.
This increase meant Renewables contributed **9.1% of worldwide electricity production** in 2014, compared to 8.5% in 2013.

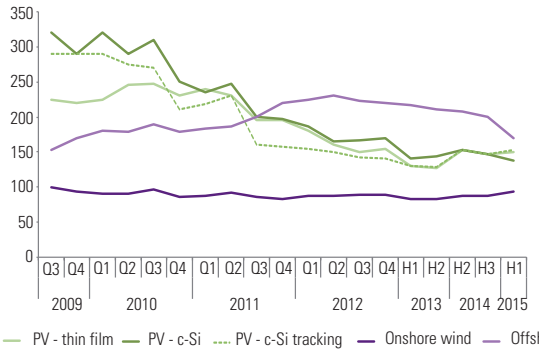
The economies of scale enabled by the rising tide of Renewables along with technological innovations have brought about a sharp decrease in renewable electricity production costs.[1] 'Network parity' has thus been achieved with respect to 'traditional' energy sources, and there is now a gap of more than €10/MWh between the price of EPR nuclear and onshore wind power.[2]

Furthermore, the close linking of production and consumption allowed by this type of energy production reduces transportation infrastructure requirements while increasing overall energy efficiency in tandem with the development of smart grids.

Thus, on economic considerations alone, **Renewables' share of the global energy matrix should continue to grow.**

1. For example, a decrease of more than 65% in construction costs for solar was observed for the period 2009-2012.
2. The overall cost of electricity (Levelised Cost of Electricity, LCOE), which includes construction and operational costs throughout the equipment's lifetime, is an indicator of this network parity.

Evolution in cost price per mWh – photovoltaic (pv) and wind



Source: Mirova based on (IEA, 2014; UNCTAD, 2014).

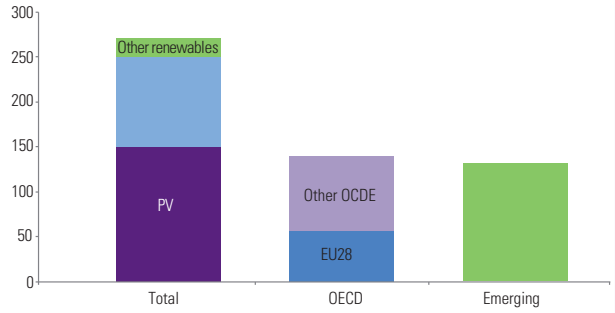
2 | Sums invested in Renewables: $270bn in 2014; +$200bn over 10 years

Worldwide investment in renewable energy represented **$270 billion in 2014**, marking an increase of 17% despite the sharp downturn in crude oil prices. This growth is due in the greatest part to investments in solar energy ($149.6bn, +25%), while investment in wind power also rose by 11% ($99.5 bn).

In addition, economies of scale have succeeded over the past few years in bringing down the costs of renewable energy technologies (especially solar), which has made each new installation increasingly more powerful.
The results posted in 2014 were thus characterised by the rapid expansion of renewable energy into new markets in

developing countries, where investment jumped by 36% up to $131.3bn,[3] compared to $57.5bn in the EU-28. This expansion has continued in near linear fashion since 2004, and more than $2 trillion in all have been invested in the renewable energy sector in the last decade.

Investments in renewable energy - 2014 (in billions of $)



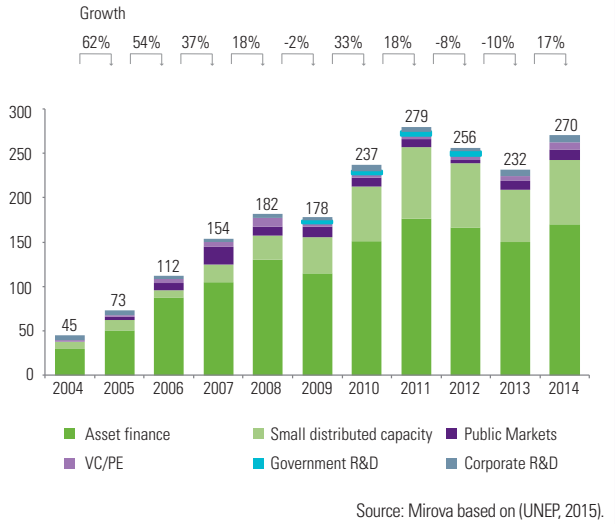
Source: Mirova based on (UNEP, March 2015).

3 | Project finance: the place of renewable energy funds

The financing of renewable energy projects has for 10 years represented **the majority of funding in the renewable energy sector** worldwide and has continued to reach as much as $244bn in 2014 **(90% of funding in the sector; +10% in 2014).**[4]

Projects of 'commercial' scale (>1 MW) have increased by 10% and now represent $170.7 billion. The growth in smaller-scale projects was even greater: +34%, reaching $73.5 billion. Indeed, large cost reductions have made rooftop solar a competitive option for businesses and households alike seeking to cover part of their energy needs with clean energies. The United States, Japan and China show the greatest increases in investment in smaller-scale projects.

Annual investments in renewable energy for the past 10 years by type of financing



Source: Mirova based on (UNEP, 2015).

3. China, with $83.3 billion invested, Brazil ($7.6 billion), India ($7.4 billion) and South Africa ($5.5 billion) were all among the 10 highest-investing countries, while more than $1 billion were invested in Indonesia, Chile, Mexico, Kenya and Turkey (Source: UNEP).
4. Source: UNEP – March 2015.

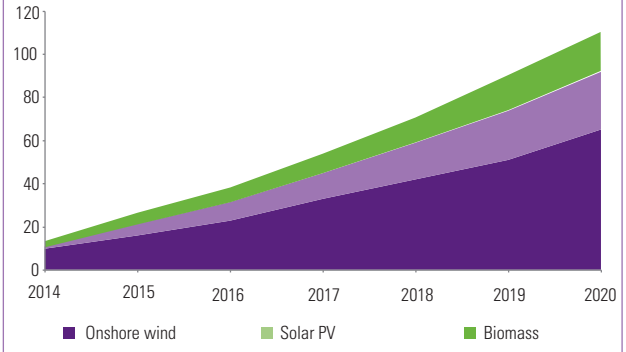
Other investment categories in this sector include: renewable energy companies raising equity on the market ($15.1bn), risk-capital funds ($2.8bn) and R&D spending by businesses ($6.6bn) and by governments ($5.1bn).

It should be noted that the proportion of institutional investors has been growing regularly: they represent around 10% of the equity in project financing in Europe through the renewable energy funds in which they invest.

4 | Significant additional requirements: the trend continues

Meeting renewable energy objectives within the European energy mix will require an increase in installed capacity between now and 2020 of more than **100 GW** (solar, onshore wind and biomass).

Investments in renewable energy - 2014 (in billions of $)



Source: Mirova based on (Ernst and Young, 2014).

Reaching this goal, given current investment amounts in the sectors involved (which are unlikely to bear further strong reductions considering their maturity), will require **a total additional investment of €236 billion**, or an estimated equity requirement of €70bn.

As for the place of project financing in underlying investments in renewable energy, it can only be imagined that renewable energy funds will continue to grow based on a business model that is ever more secure (see below).

In like manner, renewable energy funds in so-called 'emerging' markets are sure to drive growth in this kind of financing.[5]

5 | The underlying business model of renewable energy funds

Funds dedicated to financing renewable energy production infrastructure ('renewable energy funds') are assets that are **100% orientated towards the energy transition** and are particularly geared towards traditional institutional investors taking into account their risk, maturity and rate of return.

5. The risk premium is tied to the country and the way electricity prices are decided within the zone, but mostly to the technology involved.

The assets underlying these funds — such as windfarms, solar plants, hydroelectric plants and biomass conversion plants — rest on:

- Mature technologies;
- Straightforward business models now further upheld by the achievement of 'network parity';
- Proven project finance techniques.

The way renewable energy funds work, then, is by offering a project company (i.e. one dedicated to a specific kind of infrastructure) a relatively wide range of financing options (from subordinated debt to investment capital — or equity).

Investors' net profitability varies in accordance with the type of financing and the specific risk of the project; in Europe this currently ranges between 6% and 10%.

Moreover, by distancing itself from the risk-capital model, a transparency approach lets an investor endorsed by the Solvency II Directive reduce his or her statutory capital requirement.[6]

The asset class made of renewable energy funds thus presents numerous advantages in terms of equity investment:

1. Renewable energy projects are tangible assets, tied to the real economy and responding directly to its needs.

   The yield on these investments is generated mainly by the projects' returns throughout ownership (stable and recurrent cashflows), and to a lesser extent by the resale share price (on the secondary asset market).

2. A weak risk profile:
   - Historical data and statistics on Renewables;
   - Proven technologies and a long track record of projects;
   - Reliable compensation (through outfitters and energy off-takers);
   - A stable long-term contractual framework (buy-side operating contracts and sell-side power purchase agreements or feed-in tariffs).

3. Attractive yields and the prospect of value creation in association with an economic turnaround, a rise in the price of electricity and a strong demand for 'brownfield' infrastructure on the secondary market.

In proposing a market risk/yield ratio, infrastructure funds dedicated to renewable energy have increasingly appeared as a natural asset-allocation strategy in the move towards a low carbon economy. Additionally, the funds' diversity in terms of maturity, nature of underlying assets (whether on the primary or secondary market) and degree of risk (geographical area, technology) presents a broad range of investment possibilities.

6. According to the Standard formula, funds that finance renewable energy projects are classed in the 'Other Equity' category: the applied shock load is 49%. This should soon sink to 30% - 39%. A transparency approach, recommended by Solvency II, consisting in the separation of the compulsory portion from the asset portion for market risk, permits the refinement of capital requirements and benefiting from diversification, fitting well the project finance techniques that underlie renewable energy funds.

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