Cannibalization in Renewable Energies (Part II: Offshore)

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> More and more, renewable energies are competing against each other, instead of against conventional energy sources

If you read the reports from major energy agencies and industry associations, you might be tempted to conclude there is a bright future where all types of renewable energies will flourish and coexist peacefully. Well, they will not. Much like in any other sector, some technologies will trump others. In this two-part article, we analyze how solar photovoltaic (PV) is beating concentrated solar power (CSP), and how offshore wind is doing the same to wave energy.

Borrowing the nomenclature from our good friends at Insead, the renewable energy sector is quickly moving from a blue to a red ocean. Solar and offshore are two striking examples of segments where different technologies compete for similar resources, investors and policy makers. In the first part of this article we looked at the solar example, let's now look at the offshore case:

Not unlike fusion energy, wave energy (which is the most significant source of marine or ocean energy, a group which also includes tidal & currents, salinity and thermal energy) has been on the brink of a breakthrough for many years. While writing this article I revisited the earlier work we have done in this sector, and realized that the adoption of wave energy has significantly trailed our 2008 estimates. At the time, we predicted a global installed capacity of 50MW in 2011, significantly above the 10MW that were actually installed. Our 2015 estimates now also seem overly bullish when compared with IEA's latest forecasts (Exhibit 1).

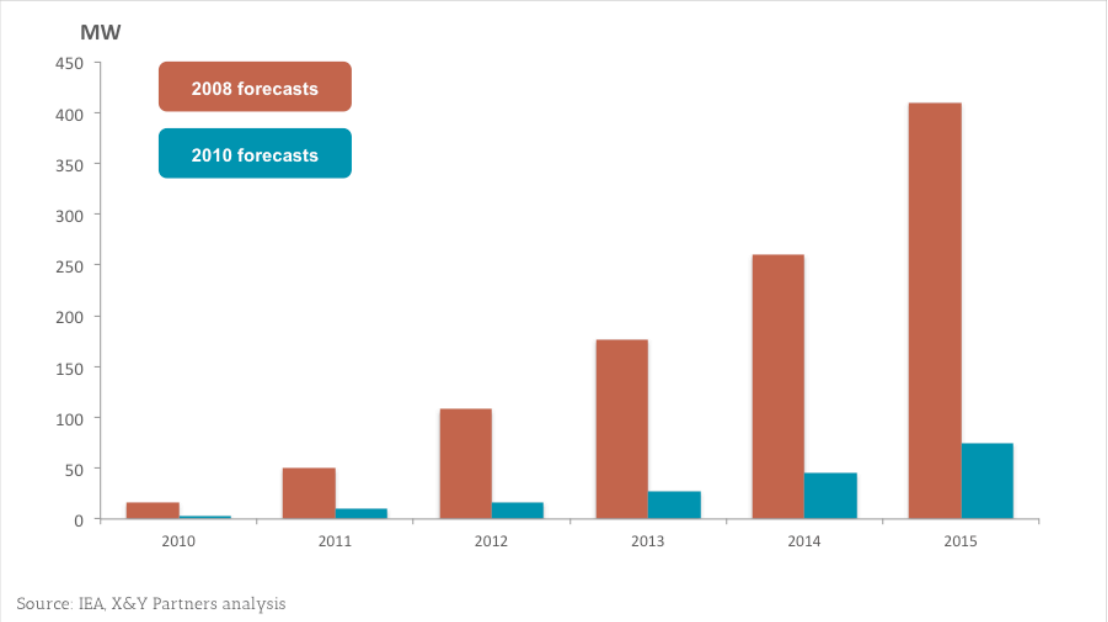


Exhibit 1 - Comparison of 2008 and 2010 global wave energy installed capacity forecasts (MW)

Apart from the typically wide error margins of this type of forecasts (which we plan to discuss in a future article), where have we (and most of the industry) gone wrong?

The blame is usually put on the 2008 financial system meltdown and subsequent credit crunch, but the problem could actually have been too much money, or at least the wrong kind of money. In 2008 close to 3B$ were injected in the marine & small hydro sector through Mergers & Acquisitions (a 149% increase over 2007), compared to only 0,3B$ through Venture Capital and Private Equity (Exhibit 2). This provides an M&A to VC/PE ratio of 10:1, the second highest in the renewable energy sector that year (the highest was in the wind sector, where consolidation of the onshore industry drove record-high M&A transactions).

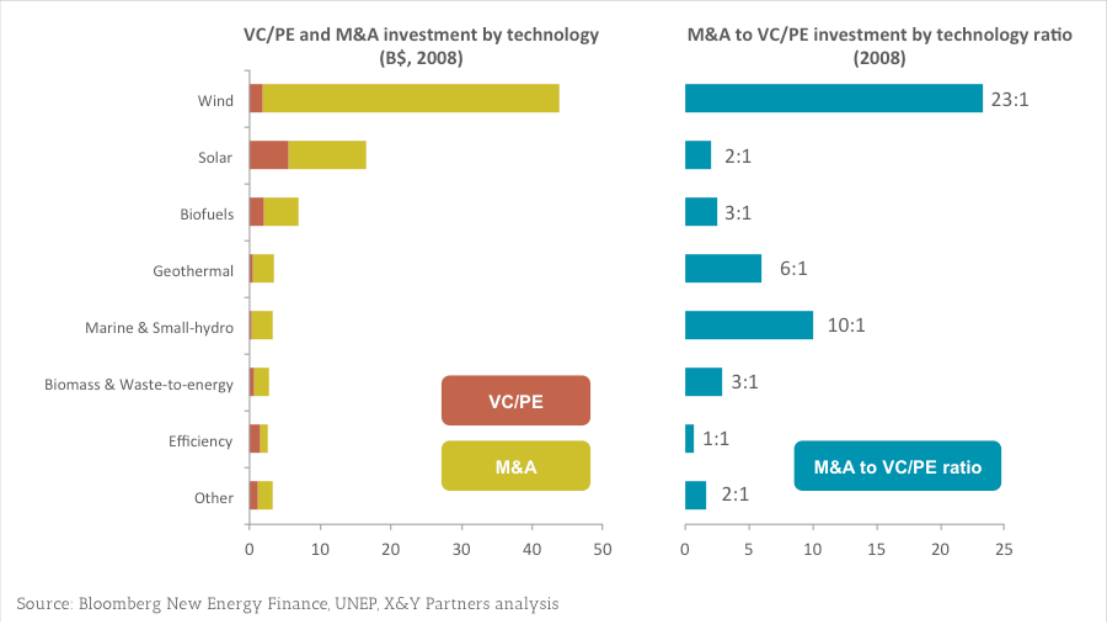


Exhibit 2 - Venture Capital, Private Equity and Merger & Acquisition investments in renewable energy (2008)

VC/PE and M&A money serve different purposes: the former is predominantly used to research & develop a technology, while the latter is used to scale it up (Exhibit 3).

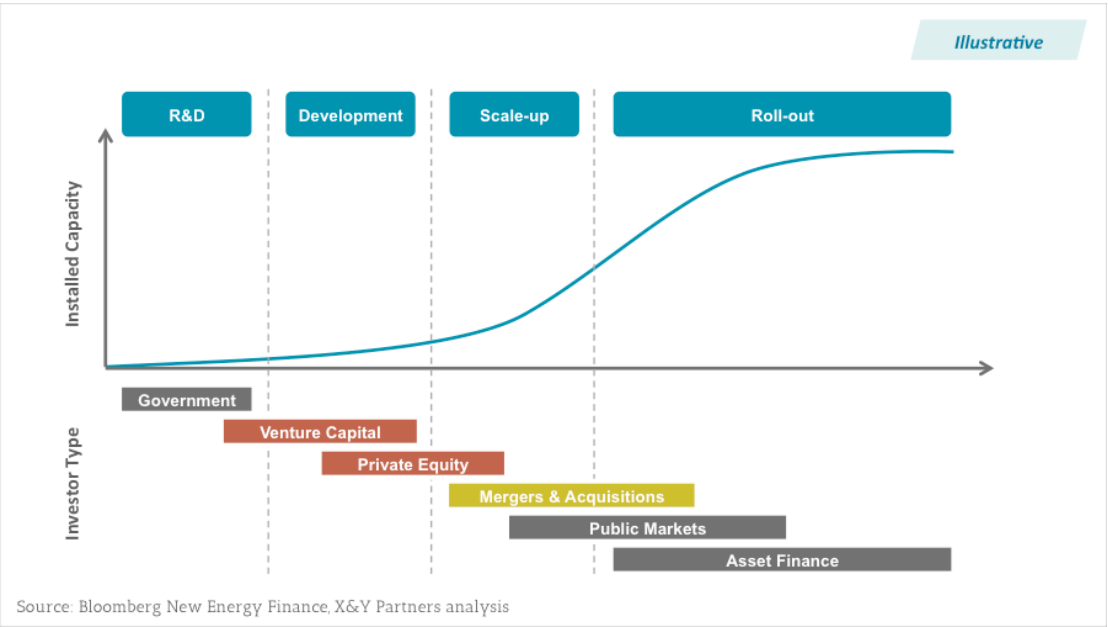


Exhibit 3 - Typical investor profiles for different renewable energy maturity stages

At a time where wave energy was still trying to overcome important technological and engineering obstacles (Exhibit 4), having 10 times more M&A money than VC/PE money might have rushed the technology into larger-scale deployments, hurting both investors and investees.

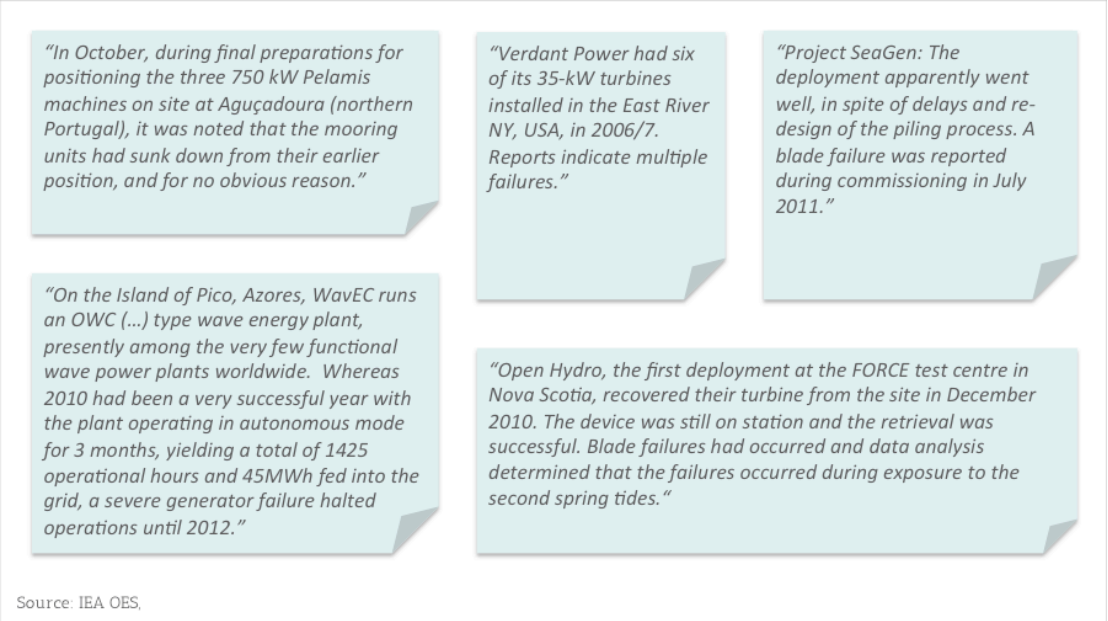


Exhibit 4 - Sample of reported issued in deployed wave energy devices

The rise of offshore wind was also not trouble-free. Its first installments used turbines originally designed for onshore applications, not for the much harsher marine conditions. As a result, and just as with wave energy, these systems would often break down, resulting in downtime that could span across several months, before sea conditions allowed for access to the platform.

However, four years have passed, and wave energy and offshore wind energy are now at two very different stages (Exhibit 5). Offshore wind turbine manufacturers have successfully developed models that can withstand harsh marine conditions, and the sector is poised for strong growth, fueled by the shrinking availability of suitable onshore sites, and by the development of technology that broadens the range of suitable offshore sites (such as floating platforms for deep-sea deployments).

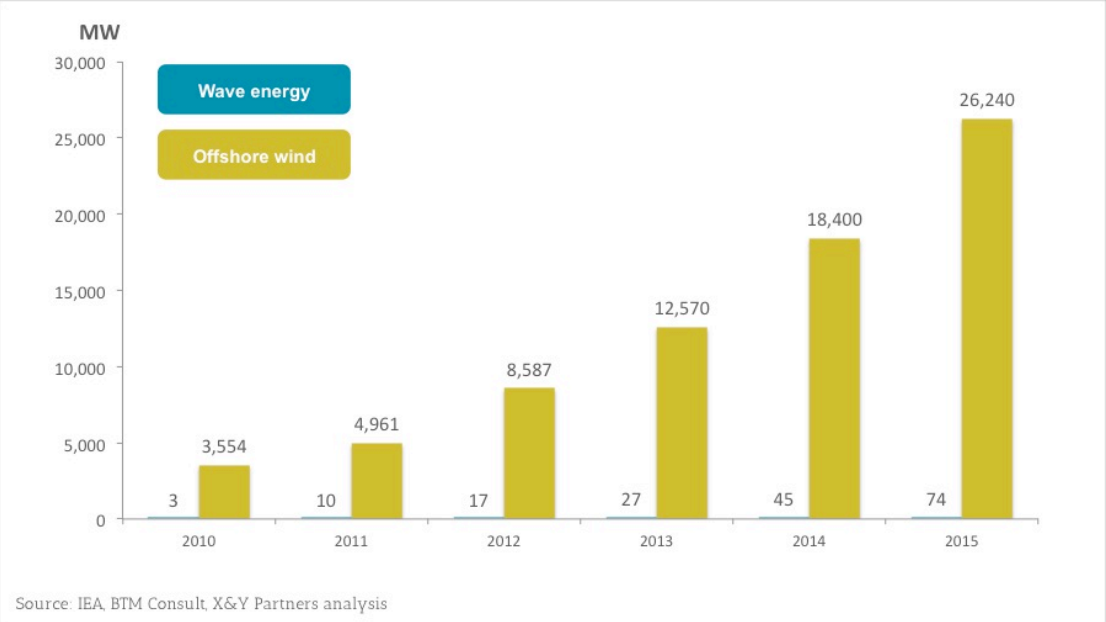
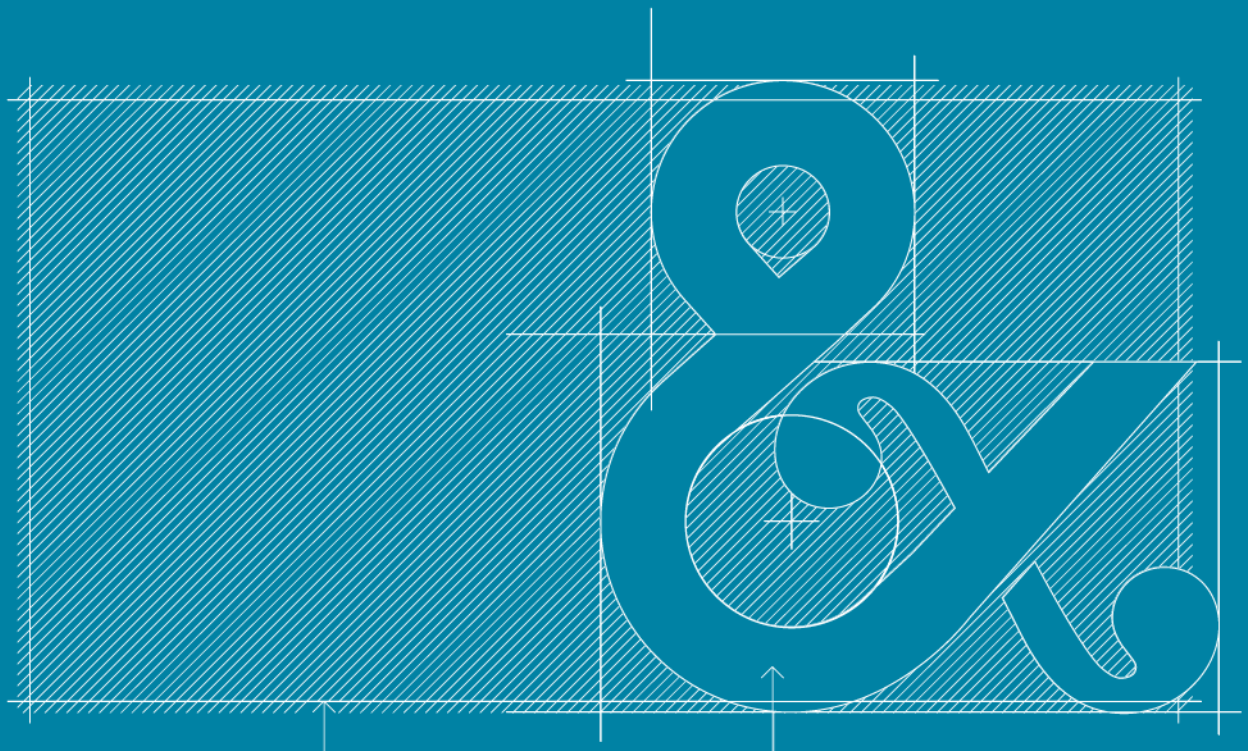


Exhibit 5 - Comparison of wave energy and offshore wind installed capacity forecasts (MW)

Does this mean wave energy will eventually disappear, trampled by offshore wind? Not necessarily. These technologies share the same space (water) but harness energy from different sources (wave vs. wind), which means that wave energy can at least evolve to become a viable option for locations where wave resources are better than wind resources. There is also a degree of complementarity between both technologies (e.g. a hybrid wave/wind park can share grid connections and other infrastructures, diluting capital and operational costs), which could help wave energy to piggyback on the success of offshore wind.

Whether this happens or not will largely depend on the wave energy sector's ability to: **i)** solve the current technological and engineering obstacles; and **ii)** attract the right type of investors to do so.



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