

COP24: Stranded assets, the trillion dollar question for the energy sector

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Executive Summary

As the parties to COP 24 gather in Katowice to agree on implementing the Paris agreement, there could be a step up towards the reality of assets having to leave the market and others coming to displace them. The UNFCCC Executive Secretary told participants that climate change could lead to productivity loss in the order of USD 2tn by 2030. We estimate that c USD 1.4tn in the energy sector alone have already been lost between 1997 and 2017, and that future loss of value from stranded assets could range from USD 0.3tn to 1.6tn. Coal assets alone could lose value in the order of USD 550bn to 2035. We expect wide spread impact across a number of sectors, first and foremost energy, thus our focus in this paper.

Beyond coal power plants as the first obvious casualty, risk affects upstream assets, infrastructure, components and equipment, contracts and services. We see an inflection point in relative returns, with ROCE (return on capital employed) of our low carbon basket exceeding that of the high carbon basket for the first time in 2017, by 2.3pp. Asset stranding amongst others is at the origin of some of the major energy company splits.

Execution, regulation and counterparty risks call owners, investors and stakeholders for a selective and dynamic approach. First, new supply companies face greater risk related to volatile wholesale power prices. Second, regulated activities take a greater weight within group structures, and there may be material revisions to regulatory returns in networks and associated activities. Last, financial strength of exposed businesses has reduced, as a result of previous stranding. Further asset losses might put entire business lines into question. Balance sheet stability is at stake if large assets have to be written off and are no longer available as financing collateral.

The global economy stands the risk to lose large amounts of value from assets becoming unproductive and misallocation of capital. While the debate about the various forms of stranding of assets is alive, and the process has already begun, we believe there is considerable scope for further accelerated loss of value from sources yet not fully appreciated. We focus on energy as the first immediately affected sector.

Which types of assets are prone to become stranded assets?

Needless to elaborate, power stations are most immediately affected assets, specifically coal powered plants. Directly associated are the assets of the entire coal supply chain including the mining sector and its supply chain. We recognise the strength of Asian coal demand resulting from close to 300GW of new coal plant build to 2022, most of which in China. However, we argue that this very plant is at high risk of later stranding along with its connected industries, even if it supports a coal value chain over the medium term. We have included these assets in

our global calculation below. We believe there is enough value in terms of contribution to system security and other services for gas, particularly CCGTs (combined cycle gas power turbines, the most efficient gas plant), that we do not count them in at this stage. That is a question of the time horizon. Large parts of the global gas fleet may only become stranded at a very late stage (see below). The oil sector is heavily exposed both as a direct emitter and energy intensive sector. Oil fields, particularly tar sands, have become riskier, as have refineries. Reduced utilisation rates may affect pipelines, vessels and midstream infrastructure. Industrial plant across all sectors that is either energy intensive or emission heavy in its own right or dependent on a CO2 heavy end customer is of concern. We point to steel manufacturing, automotive, pulp/paper, and fertilisers as a non-exhaustive list, even though we do not analyse them in this paper.

When will assets become stranded?

We see key catalysts for stranding in the context of climate change: A step up in CO2 prices, currently occurring and already partially stranding assets, the next leg up in emissions reductions and prices in Europe and elsewhere, business adjustment for a 2 degree scenario as per the UN Framework and IEA’s new policy scenario, and lastly adjustment of the target beyond a 2 degree scenario. We see three stages of coal phase out: A first phase of reduced load factors which has already begun, inefficient plant leaving the market and transition to CCGT; supported low carbon systems through the 2020s with early full phase outs in the mid-2020s; and lastly full end of coal from the mid-2030s to 2040. Gas will in our view retain residual value due to its critical functions. But, there is business as usual in gas and oil, according to our gage.

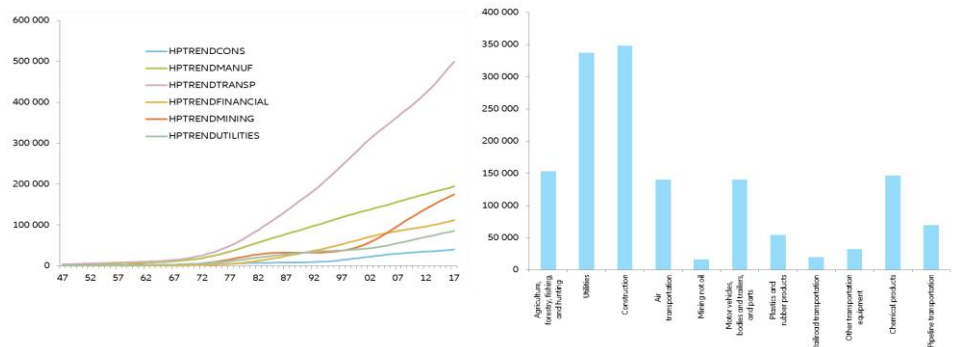
How much value could be lost?

As a first step, we consider historic stranding. In order to isolate climate change from other factors, we have looked at a depreciation based approach for the US. Our intuition is that a process of an over-elevated consumption of fixed capital under this definition can be associated with stranded assets. A trend analysis in long term time series of amortisation by relevant sectors since 1947 (source: US Bureau of Economic Analysis) reveals a break in the trend of the mining, –oil and gas sectors from 1997 onward suggesting a new regime of capital depreciation post signature of Kyoto protocol. Consequently, we have decided to calculate the difference between what has been observed in terms of depreciation and the theoretical path of depreciation for diverse sectors, maintaining a trend prior to 1997-2017 era.

Figures 1&2:

Trend in consumption of fixed capital

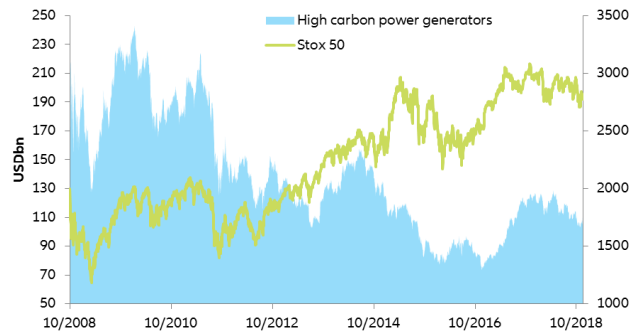
Estimated amount of stranded assets (USD bn)



Sources: US Bureau of Economic Analysis, Euler Hermes, Allianz Research

Our estimate of stranded assets, based on a normal trend of depreciation and what has been observed, shows that oil and gas has registered an approximate cumulated loss of more than USD 1 trillion between 1997 and 2017, while utilities and construction follow with USD 347 bn and 350 bn of losses respectively. European utilities have been particularly affected by climate change induced energy transition and loss of asset value. Our basket of European coal generators has lost USD 167bn of market capitalisation between 2008 and 2016 whereas the broader market has added Eur 800bn over the same period.

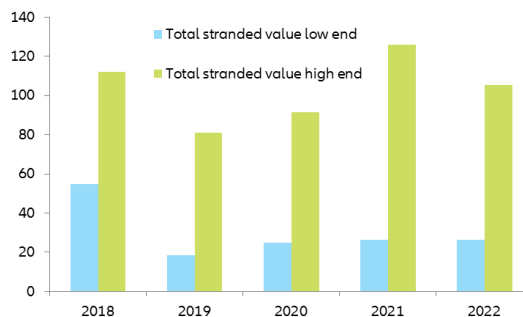
Figure 3: Market capitalisation European high carbon power generators vs Stoxx 50



Sources: Bloomberg, Euler Hermes, Allianz Research

Estimates for future stranded assets according to various definitions in the energy sector alone range from USD 300bn (source: The Carbon Brief) to USD 1.6tn (source: Carbon Tracker). There is M&A activity in the sector, and transaction values might crystallise a view of positive future value. Whichever one prevails depends on the quality and management of the assets in question and the speed of change in the market place. In any event, there is risk of stranding of hard assets and goodwill arising from M&A in the coal sector, in Europe and elsewhere. A very simplistic way of estimating loss of value would be to assume immediate loss of market value of all coal fired assets, existing and yet to be built. We have undertaken this exercise by assuming a global coal phase out by 2035 and resulting stranding of the entire global coal park by that time. We have based our calculation on average current construction cost for new coal plant build from 2018, historic values for capacity retirements, and average industry amortisation periods. This yields a value of USD 150-515bn for coal assets alone. Large parts of conventional power generation fleets will be loss making over the long term. We argue that such losses are just another expression of stranded assets as they are ultimately triggered by climate change.

Figure 4: 2035 loss of value coal assets by year of trigger (build/retirement)

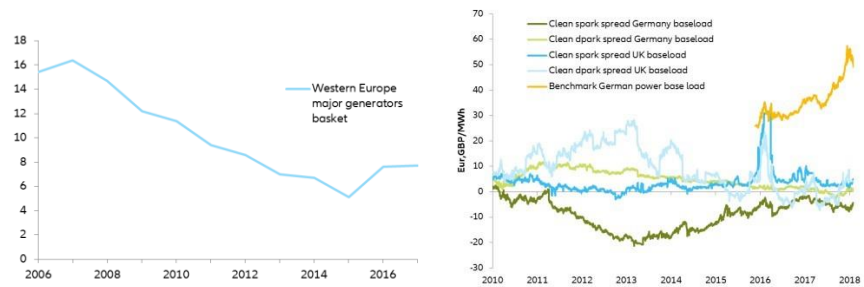


Sources: Bloomberg, Euler Hermes, Allianz Research

Stranding is gradual and visible

We choose power in Europe as an archetype, as the region is most advanced in the matter and the effects most visible. Europe has already seen assets strand even though more is still to come. Cumulated extraordinary write downs and impairments over the period 2010-17 amounted to Eur 130bn, of which in turn 68% relating to generation assets (source: Company disclosures, EY). While they are a result of market forces such as power prices, we attribute these very market forces at least partially to direct and indirect climate change effects. Climate change regulation has led to coal crowding out by renewables, overcapacity and therefore prices not being driven by the marginal cost of carbon intensive technologies. Profitability has shifted away from carbon intensive generation to clean technologies in a very visible way, as evidenced by rapidly declining ROCE despite very large reduction in capex. Collectively, the sector has destroyed about 1200bps of return despite significant reduction in capex as the direct result of eroding profitability and arguably late reaction to slow stranding of assets. All of this has occurred despite a 50% power price rally and recovery to pre-financial crisis levels as shown in Figure 7 below. It is low carbon merchant assets that have reaped the benefit.

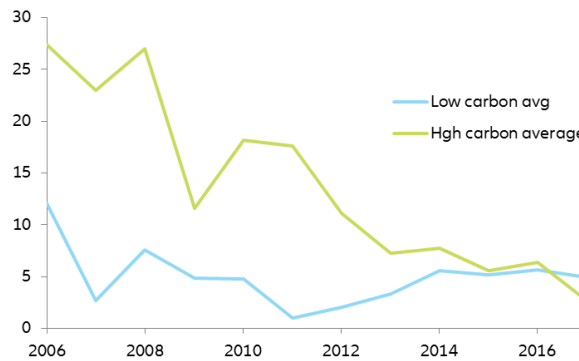
Figures 5&6: Wholesale power markets and power generation ROCE



Sources: Bloomberg, Euler Hermes, Allianz Research

The challenge of fossil fuel profitability, which we have chosen as one proxy for the trajectory of asset stranding, is clearly visible when looking at the divide of ROCE over time for high vs low carbon generations. For the chart below, we have used representative baskets of the major high and low carbon footprint generators. It is worth noting that the low carbon basket is characterized by high levels of growth investment that initially suppress returns.

Figure 7: High vs low carbon generators' ROCE (%)



Sources: Bloomberg, company data, Euler Hermes, Allianz Research

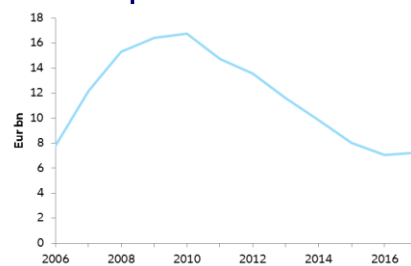
The change in return on invested capital is at the origin of some of the major corporate transformations we are currently seeing. While we are of the view that the majority of them is

positive for the companies in question, we still highlight that they originate from destruction of value. Furthermore, even though conventional returns are being substituted with those from with clean energy, by virtue of scale, declining conventional asset returns weigh more than growth from small scale renewable projects still. We therefore expect systematic return recovery from 2020 only.

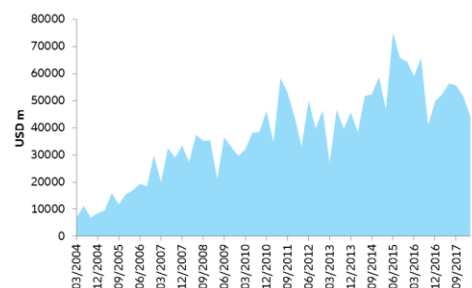
Capex in itself, ie the expectation of future return opportunity, shows the same divide with a visible displacement of investment away from activities exposed to climate change and asset stranding towards those assets that stand to benefit from transition to a low carbon world. We expect continuation of withdrawal of investment from high carbon intensive and redirection into clean growth activities.

Figures 8&9: High vs low carbon investment

Capex high carbon generators basket Europe



Global clean energy investment



Sources: Bloomberg, BNEF, company data, Euler Hermes, Allianz Research

Higher risk for capital and corporate strategies – and what it means for business

The change of capital allocation is altering risk profiles. The mature clean energy technologies now command risk premiums that are comparable to conventional businesses, by virtue of fossil fuel risk premiums increasing and clean tech ones decreasing. Yet, we see new sources of risk.

- Asset stranding amongst others is at the origin of some the major energy company splits. Businesses are subject to execution risk as a result of radical transformation. The new supply companies face greater risk related to volatile wholesale power prices.
- Increased regulatory risk is another one as regulated activities take a greater weight, combined with potential for material revisions to regulatory returns in networks and associated activities. Additionally, there is the end of subsidies for mature technologies and associated change of business models.
- Businesses are subject to execution risk as a result of radical transformation. Managements should consider value chain effects trickling through an entire industry and its adjacent industries in order to adjust or protect their potential exposure.
- Companies will face greater counterparty risk: Exposed businesses' financial strength has reduced as a result of previous strandings. Further asset losses might put entire business lines into question. Balance sheet stability is at stake if large assets have to be written off and are no longer available as financing collateral. Companies will have to deal with new, less experienced and less well financed counterparties, both as customers and suppliers. Companies may have to manage exposure to greater payment delays and customer risk from new actors and smaller scale businesses.
- Competitive intensity will increase significantly. Technology companies, big oil, heavy industry entering into renewables and aggressively competing non-energy companies such as major online heavyweights and others entering the decentralized and consumer oriented areas.

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