

Climate change investment risk

Update on the “Smart Carbon” methodology

April 2017

In 2015, Impax developed a new approach to managing climate change investment risk within equity portfolios, exploring the potential impairment to future cash flows of companies whose valuations are linked to fossil fuel assets (i.e. extractors of coal, oil and gas).

We have been running three model portfolios based on modifications to the MSCI World Index, which reduce Exploration and Production (“E&P”) exposure to varying degrees, and in order to preserve energy price (factor) exposure, replace it with Energy Efficiency stocks. The models have been rebalanced quarterly over the past 18 months in response to MSCI index weightings and updates to our proprietary fossil fuel risk analysis.

In this paper we report on the model’s continuing development and discuss why, over the past 18 months, reinvesting fossil fuel exposure in energy efficiency exposed equities has outperformed a “do nothing” approach.

Results from this period

Since inception, the model portfolios have performed slightly better than the market with the full divestment option performing delivering a return of 45bps in excess of the “do nothing” MSCI World index, with limited impact on tracking error.

Table 1: Performance of the “Smart Carbon” Portfolios (see p4 for definition of portfolios)

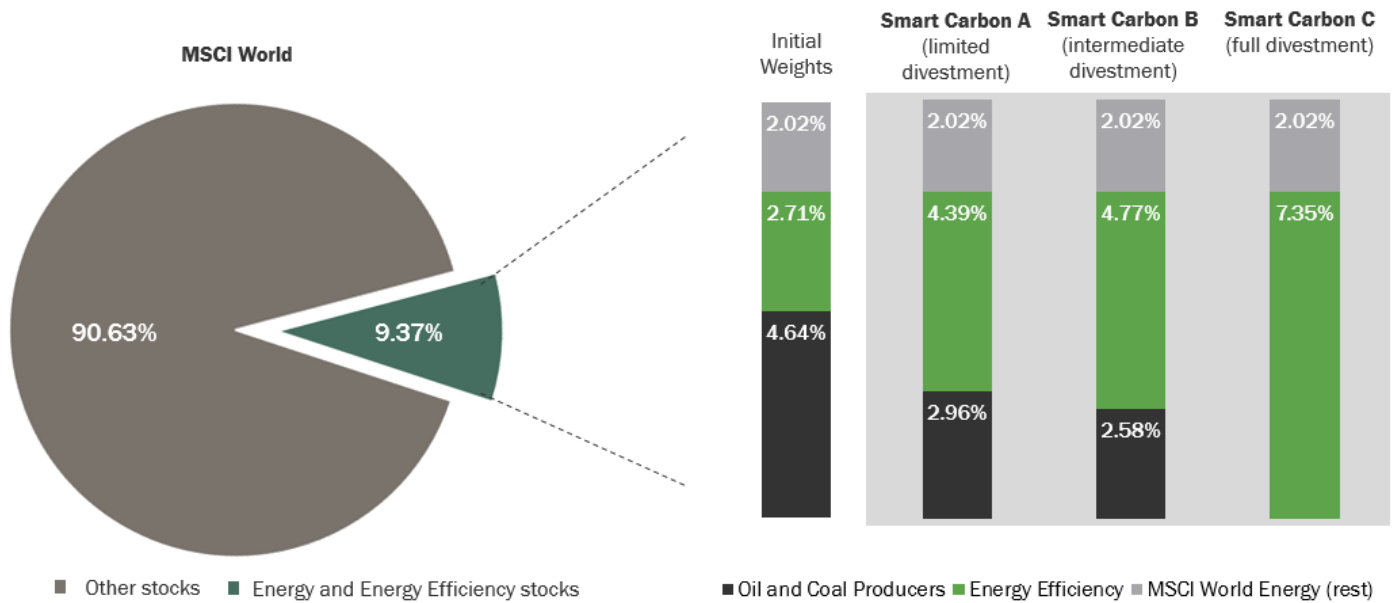
Smart Carbon Options	Performance* (USD; 01/09/15 to 28/02/17)	Tracking error to MSCI-W
A – Divestment with Threshold	19.19%	0.22%
B – Graded Divestment	19.24%	0.26%
C – Full divestment	19.59%	0.56%
Do Nothing - MSCI World	19.14%	-

Source: Impax model portfolio, run using Factset.

* These results are based on model performance results that have certain inherent limitations. Unlike the results shown in an actual performance record, these results do not represent actual trading. Also, because these trades have not actually been executed, these results may have under- or over-compensated for the impact, if any, of certain market factors, such as lack of liquidity. No representation is being made that any account will or is likely to achieve profits or losses similar to these being shown.

Our Smart Carbon B model portfolio (partial fossil fuel divestment and reallocation to Energy Efficiency) now indicates a further reallocation towards Energy Efficiency from Fossil Fuels, relative to the recommendations six months ago¹ (2.10% in March 2017 vs 1.65% in September 2016). This rebalance results in portfolios shown in Figure 1 (see also original portfolios in the Appendix, Figure 3).

Figure 1: "Smart Carbon" model portfolios as at 1 March 2017



Source: Impax model portfolio, run using Factset.

¹In considering this switch, investors should also note that the E&P Stocks and Energy Efficiency stocks are exposed to other risks that are not described in this paper.

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The changes in allocation have been influenced by the lower profits of the E&P companies, driven by long term low oil price expectations, makes them more sensitive to the introduction of a carbon price to their end markets.

Market developments

The six months since our previous update have been tumultuous in political terms, creating significant currency movements and affecting risk appetite in capital markets, impacting equity valuations and oil prices. The most significant of these events which we believe relate to the Smart Carbon investment thesis are discussed below:

- Ratification of the Paris Climate Agreement ahead of President Trump's election**
 The global agreement to reduce greenhouse gas emissions came into effect two years earlier than expected as governments sought to protect momentum on emissions reduction policy in the face of US opposition under an imminent Trump administration. Although President Trump is not likely to be active in applying local constraints to fossil fuel use, or apply diplomatic pressure on others to do so, the international consensus around tackling emissions appears to remain solid.
- Lower oil prices**
 In our last note we highlighted the decline in oil futures prices used within our scenario modelling. During the period other factors pointing to oversupply, notably the failure of OPEC to agree production cuts, have kept oil prices at within a lower range. In this rebalance these lower prices have only adjusted very slightly (as shown in Table 2 below) indicating long term market expectations of depressed oil prices.
- US energy policy**
 The new US Administration has indicated an interest in increasing domestic oil and gas production, which would most likely depress prices.

Table 2: Price of oil futures (USD/barrel)

Year	As of Sept 2015	As of Sept 2016	As of March 2017
2020	59	52	54
2021	60	53	54
2022	61	54	55
2023	61	55	56
2024	62	55	57
2025	63	56	57

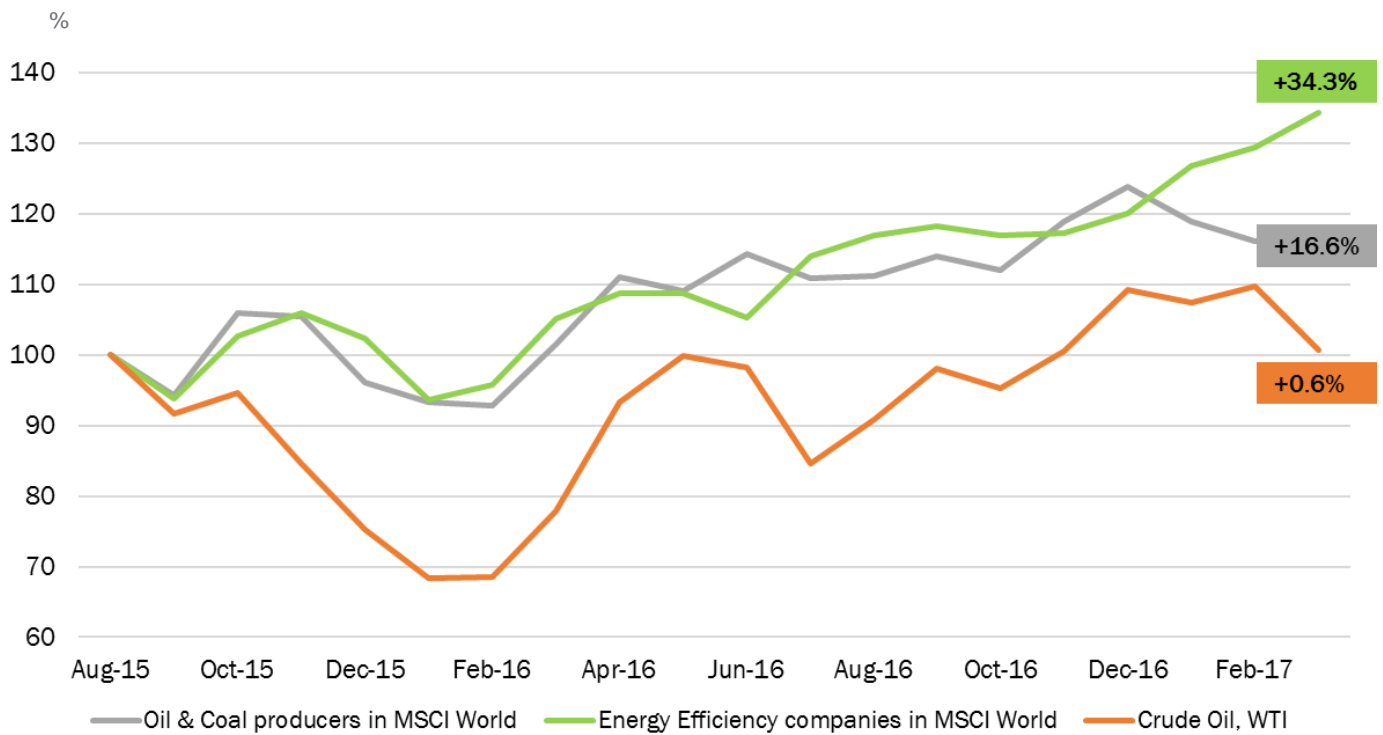
Source: Factset.

Within this uncertain macroeconomic and political context, energy efficiency markets have shown sustained positive returns, as shown in Figure 2 below. The fluctuations in oil price since the inception of the model portfolios have provided further support to the rationale for replacing Fossil Fuel equities with Energy Efficiency names. During this period Energy Efficiency companies in the MSCI World Index² have shown material outperformance over the oil price with an 86% correlation to energy stocks.

By making this switch from E&P stocks to Energy Efficiency names, the portfolios have retained energy price exposure whilst reducing carbon price risk exposure and demonstrating only a very small tracking error (0.56%).

²Defined as the overlap between the MSCI World Index and the FTSE EO Energy Efficiency Index.

Figure 2: Performance of oil, Energy Efficiency companies and Fossil Fuel producers (USD)



Source: Bloomberg.

Ongoing development of the Smart Carbon Portfolios

At launch, given the complexity of the issue we stated our intention to:

- (a) continue refining our approach in modelling the impact of Carbon Prices, and
- (b) update the analysis to reflect changes in the asset mix of E&P Stocks.

We will therefore continue to run these model portfolios and provide evidence on both performance and relevant policy developments in this area.

APPENDIX

Background to this update

The likelihood that governments of major economies will act within the next decade to reduce greenhouse gas emissions is accelerating in the wake of the Paris Climate Agreement (*which came into force in November 2016, two years earlier than expected*).

While we expect variety in the design and pace of policies across countries, the ultimate effect will likely be a cost penalty (“Carbon Price”) to users of greenhouse gas emitting fuel sources in order to reduce demand. Such intervention in fossil fuel markets has the potential to create stranded assets among the highest cost extraction sites. For a typical investor, the greatest exposure to Carbon Price risk arises through ownership of E&P Stocks. These companies are unlikely to be able to pass on the full effect of Carbon Pricing to their customers or to quickly adjust their revenue or asset base to avoid this exposure.

In contrast, companies with energy efficiency solutions will see an expansion in their markets as consumers of energy seek to protect themselves from retail prices artificially raised by policy interventions.

Impax’s Smart Carbon methodology

In September 2015, Impax introduced an investment strategy that enables investors to reduce exposure to companies engaged in the exploration and production of fossil fuel assets (“E&P Stocks”) and switch into stocks whose principal business is in the Energy Efficiency sector.

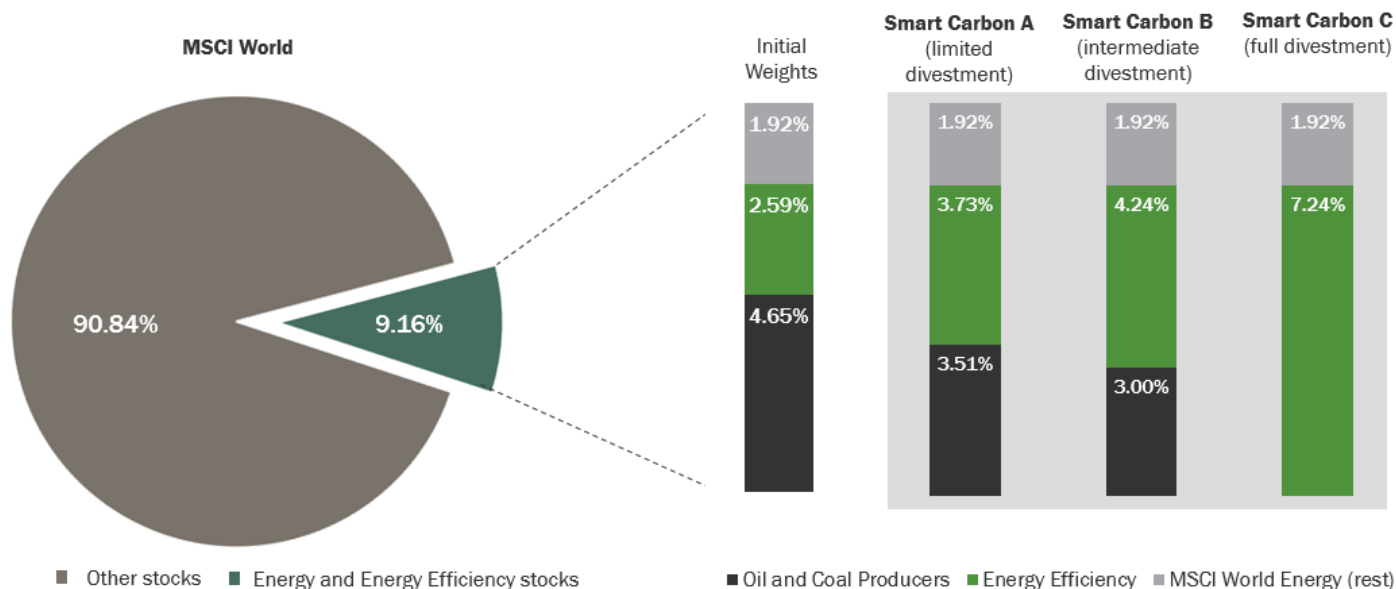
We decided to avoid the popular approach of “carbon footprinting” as this typically fails to take account of a company’s pricing power, and may actually increase risk within the portfolio.

Instead, we developed scenarios around the likely impairment to future cash flows of companies based on the cost of extraction of their underlying assets. This ensures that we are reducing exposure to companies whose value lies at the right-hand side of the cost curve rather than treating the risk to all fossil fuel assets equally. Having assessed the risk to future cash flows of each company we developed three alternative solutions for rebalancing the MSCI World index that reflect stock level risk. Divested proceeds were reinvested in energy efficiency names. The remainder of the portfolio was left untouched.

The initial portfolios shifted between 4.5% and 0.7% of the index from E&P into Energy Efficiency (see Figure 3 below).

- **Divestment with Threshold (Smart Carbon A):** No change to the weighting of stocks with less than 3% reduction in value from Carbon Pricing; zero exposure to companies with more than a 10% reduction; cut exposure to companies with reductions between 3% and 10% by 50%.
- **Graded Divestment (Smart Carbon B):** Reallocate capital from companies with a reduction in value higher than 10%; reduce exposure to the remaining companies in proportion to their value reduction.
- **Full Divestment (Smart Carbon C):** Reallocate capital from all coal and oil producers in the index towards energy efficiency stocks.

Figure 3: "Smart Carbon" portfolios as at 1 September 2016



Source: Impax model portfolio.

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For a fuller explanation of Impax’s Smart Carbon Methodology please see the original whitepaper [here](#).

<http://www.impaxam.com/resource-efficiency/impact-investing>

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