Ireland Strategic Investment Fund, Fossil Fuels and Climate Change

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Key Findings

- As of December 31st, 2015 disclosures, the Ireland Strategic Investment Fund (ISIF) had investments in at least 152 companies in the fossil fuel sector, with a value of **€133,100,509** (12.2% of all stocks owned by ISIF).
- The ISIF had investments in about 50% more 'green' companies (companies which derive at least 20% of their revenue from environmental solutions or new energy) than the MSCI ACWI (Morgan Stanley Capital International, All Country World Index) benchmark. It also appears to tend to pick more carbon efficient stocks particularly in the utility sector, demonstrating manager awareness around climate change.
- However, the ISIF has higher than average exposure to high carbon sectors. It has investments in 50% more fossil fuel companies and has a 50% higher carbon footprint than the MSCI ACWI benchmark.
- Had the ISIF sold off its fossil fuel stocks at the beginning of 2015 in favour of investing in clean energy companies, it is estimated the fund would have accumulated **€22 million more** at the end of 2015, while **lowering the portfolio's carbon footprint by 48%.** It is estimated that retaining fossil fuel investments cost the ISIF **€100 million** over the past three years.
- Unwinding existing fossil fuel investments in favour of increasing investments in green companies would further align the ISIF with Ireland's sustainability objectives (in particular the Paris Agreement) and would position the ISIF to capitalise on the global energy transition.

Introduction

This research, commissioned by Trócaire, aimed to answer the following questions:

1. What is the current level of investment of the ISIF in Fossil Fuel Companies?

2. How would the ISIF have fared if its 2015 global fossil fuel investments had been invested globally in clean energy instead?

The analysis is based on the ISIF's global portfolio (disclosed quoted equity holdings in the NTMA Annual Report 2015). It does not include analysis of the ISIF's investments in the Irish economy.

1.What is the current level of investment of the ISIF in Fossil Fuel Companies?

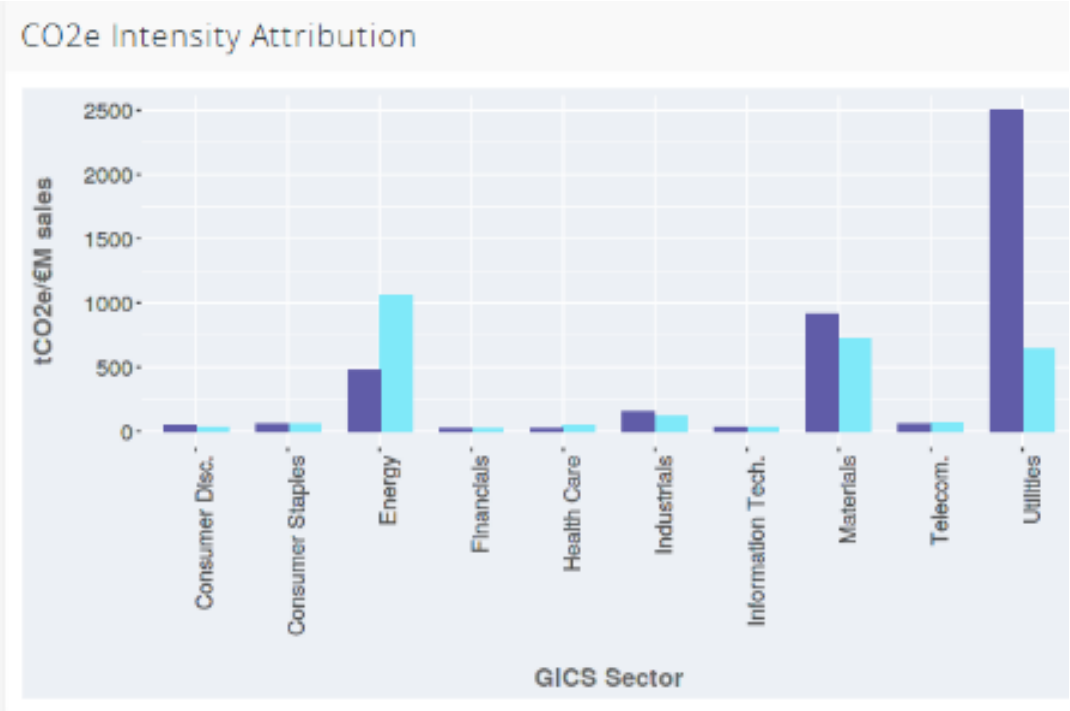
As of December 31st, 2015, the ISIF portfolio included at least **152 fossil fuel* quoted equity holdings** with a value of **€133 million**, comprising approximately **12.2%** of the quoted equities portfolio weight.

ISIF Fossil fuel holdings by type	% exposure*
Coal miners and coal power companies	1.8%
Oil and gas companies	10.8%

Fossil fuel companies definition: Weighted exposure to fossil fuel companies (GICS Sector=Energy, SASB SICS=Coal, SASB SICS=Oil & Gas, Custom list of coal miners and utilities from Bloomberg, Carbon Underground 200 largest oil, gas and coal companies by reserves, Top 100 Coal Miners and Top 100 Coal Power burners with over 30% from thermal coal mining revenues or GW power generation)
*Note: Some companies fall into both categories so summing the exposures adds up to more than 12.2%,

Carbon Footprint of ISIF Equities

- The ISIF carbon footprint is 339 tonnes of CO_2 equivalent (CO_2e) per €million sales based on direct (such as factory smokestacks) and indirect (mostly from electricity) CO_2e emissions, 50% higher than the MSCI ACWI benchmark footprint of 225 tCO_2e/€m sales.
- This higher footprint is a result of sector allocation, not stock selection, which means the ISIF tends to invest in more carbon efficient stocks relative to sector peers, but also tends to invest more overall in high carbon sectors.
- The ISIF has higher than average exposure to high carbon sectors. It has investments in 50% more fossil fuel companies and has a 50% higher carbon footprint than the MSCI ACWI benchmark.



Light blue=ISIF
Dark blue=MSCI ACWI

2. How would the ISIF have fared if its 2015 global fossil fuel investments (coal, oil and gas) had been invested globally in clean energy (companies with more than 20% clean energy revenue) instead?

If the ISIF had sold off its fossil fuel stocks at the start of 2015 and re-invested in clean energy stocks, it would have made an estimated **€22 million more** than it did by staying invested in fossil fuel stocks as of December 31st 2015, with a higher sharpe ratio (a measure of risk-adjusted return), while **lowering the portfolio's carbon footprint by 48%.**

	Fossil Free ISIF	ISIF	Difference
Modeled 1 Year Return	2.6% (rounded)	1.5% (rounded)	+1.2% (€22 million)
Sharpe Ratio	0.21	0.12	+0.09
Green Exposure	20.6%	8.4%	+12.2%
Weighted Carbon Intensity	**176 tCO_2e/€**	**339 tCO_2e/€**	-48%

The high cost of investing in fossil fuels in the 21st century

Not divesting from fossil fuels cost the quoted equities portion of the ISIF Discretionary Portfolio an estimated €22 million in calendar year 2015, and €100 million over the past three years (see Appendix A).

- **This is directionally consistent with market trends for major indices**.

Over the five-year period to December 31st 2015, the MCWI Ex Fossil Fuels Index (which is the standard index minus fossil fuel stocks) has outperformed the MSCI ACWI by 1.4% per year. The FTSE Environmental Opportunities 100 Index (which tracks the 100 biggest companies with significant (>20%) revenue exposure to environmental solutions) returned an annualized 5.7% over the five year period to December 31st, 2015, while the MSCI World Energy Index (100 largest oil, gas and coal companies) lost an annualized 3.21%.

Index	Annualized Returns (5-Year)
FTSE Environmental Opportunities 100	5.7%
MSCI World Energy Index	-3.21%

- **Over the 20th century fossil fuel stocks outperformed the market in general, however over the past ten years this has not been the case in most time periods. This is due to both oil price volatility and changing expectations about the long-term future of oil in a carbon-constrained economy with the rise of the electric car and renewable energy.**

Over the long term fossil fuel company valuations can be expected to decline in inverse relationship to a faster than expected pace of technological change for fossil fuel substitutes (electric cars, solar power, energy storage) and/or regulatory actions to reign in air and carbon pollution. Most fossil fuel company stock valuations do not assume an ambitious pace of technological and regulatory change, even though there are signs this is increasingly likely. The Bank of England Governor Mark Carney has warned of the danger of a “Minsky Moment” if market expectations around the pace of technological and regulatory action change abruptly, causing a rapid fall in fossil fuel company valuations. To guard against this disorderly transition, some prudent investors with a long-term outlook are unwinding their fossil fuel exposures.

The Energy Transition Investment Trends

- **Major investment indices are now only half as exposed to the fossil fuel sector (1.5% to coal, 7% to oil and gas) as they were five years ago. This is not due to any active decisions to divest, but rather because fossil fuel stocks have lagged while other sectors have produced healthy returns.**

- **While fossil fuel stock performance stagnates, clean energy is taking off.**

The world is currently adding twice as much clean power capacity as coal, oil, and gas combined, according to *Bloomberg New Energy Finance* (BNEF). Wind's market share of power generation has doubled four times in the past 15 years, and solar has doubled seven times. It's also getting cheaper to make power from wind and solar, thanks to technology, better financing and economies of scale. Increased demand for a technology generally reduces prices, whereas increased demand for a commodity increases prices. This basic calculus has driven the price of a renewable kilowatt of energy ever downward, making the choice of energy an economic one. Companies which make a significant amount of their revenue from environmental solutions now make up 5% of global investment indices; the Clean200 list (www.clean200.org) of companies have a collective value over $1 trillion. While the long-term trends auger well for clean energy investments in contrast to fossil fuel energy investments, commodity price volatility will produce some short-term periods of outperformance for the fossil fuel sector, such as was the case in the first six months of 2016.

- **In the next 10 years, McKinsey expects oil demand growth to flatten due to growing fuel efficiencies and competitive technologies such as the electric car.**

Battery prices fell 35% last year, and electric car sales rose by 60%. By 2022, BNEF estimates electric vehicles will cost the same as their internal combustion counterparts, and if growth continues at the current pace, oil displacement by electric cars will reach 2 million barrels per day by 2023—the size of the current oil glut and enough to drive global oil prices to record lows. Factoring in autonomous cars and ride-sharing services, electric cars could reach 50% of new car sales by 2040, according to BNEF, 50 times higher than what OPEC is projecting.

The Energy Transition Investment Trends

- **Market trends alone do not portend an imminent conclusion to the fossil fuel age, but they do suggest an end to fossil fuels as a long-term growth market and the beginning of a long run expansion of clean energy demand.**

The prospects for market trends should also be viewed in the context of ongoing changes set to increasingly influence the financial and regulatory environment. From the commitments made by Governments in Paris Climate Agreement, to the Bank of England (the Bank's Governor Mark Carney has warned investors not to find themselves left with stranded fossil fuel assets (investments which are unable to generate the expected economic return as a result of changes in the market and the regulatory environment), to the Vatican (Pope Francis has made moral invocations to drastically reduce use of fossil fuels in the Papal Encyclical *Laudato Si'*).

- **Many mission-mandated investors believe that companies which create positive rather than negative externalities will prevail. In the case of climate solutions investing, it appears increasingly likely that this is the case.**

Many investors have found this out the hard way. Indeed, in a world of limited capital every investment has opportunity cost. Take coal, which accounts for over 40% of global greenhouse gas emissions. The industry is declining rapidly in value, especially in the United States. Peabody Energy, the largest private-sector coal company in the world, filed for Chapter 11 bankruptcy protection this April, following Arch and Alpha. The Dow Jones Coal Index dropped 93% over the past five years. Oil companies are facing similar problems. Fifty-two have filed for bankruptcy since 2015, and over a third of the world's biggest oil and gas companies have crushing debt loads (over $150 billion) and cash flows depressed by low oil prices, according to the Deloitte Center for Energy Solutions.

Appendix A: Methodology

The one-year analysis used the ISIF quoted equities as reported in the 2015 Annual Report for the NTMA, using a starting investment value of €1,771 million (value of quoted equities as of December 31st 2014). The three-year analysis used the same holdings and a starting value of €2,052 million (value of quoted equities as of December 31st 2012). It then estimated the potential financial impact had the fund shifted its investments from the fossil fuel companies including coal utilities (The Carbon Underground 200 list originally pioneered by Carbon Tracker was provided by Fossil Free Indexes, and consists of the top 100 public coal companies globally and the top 100 public oil and gas companies globally, ranked by the potential carbon emissions content of their reported reserves) and the most coal-intensive utilities (utilities which generate more than 30 percent of electricity from coal, provided by the Sustainable Finance Programme at the University of Oxford's Smith School of Enterprise and the Environment) to companies that derive at least 20% of their revenues from environmental markets or new energy (Companies providing environmental solutions derive at least 20% of their revenues from environmental markets or new energy as verified by FTSE Environmental Markets or Bloomberg New Energy Finance). From there, the total returns over a one and three year period to December 31st 2015 were calculated.

Fossil fuel definition: Weighted exposure to fossil fuel companies (GICS Sector=Energy, SASB SICS=Coal, SASB SICS=Oil & Gas, Custom list of coal miners and utilities from Bloomberg, Carbon Underground 200 (largest oil, gas and coal companies by reserves), Top 100 Coal Miners and Top 100 Coal Power burners with over 30% from coal mining revenues or GW power generation)

Appendix B: Data Cleaning Methodology

Strip out non-pertinent info (e.g. country, totals, etc.)
Put same company on same Excel row
Delete companies with "-" holdings
Use "Text to Columns" to isolate # shares
Use Substitute to eliminate # shares from text string
Use filter to eliminate numbers (i.e. amount holdings)
Use substitute to isolate equity name
Use Trim and Left to clean equity name and holdings
Match cleaned equity name to original - restore numbers to non-matched equity names that lost numbers in filter (e.g. 3M)
Sorted by holdings amount
Run equities through Bloomberg (BDP search), finding first three name and ISIN predictions
Visually find best matches among predictions
Ambiguous equity names matched using national context (from PDF), ISIN country information, Quotenet.com, etc.
Use pre-existing database to match unmatched equities with ISIN
Use Quotenet.com, etc. to match unmatched equities with ISIN
Trim name, ISIN and holdings; create CSV file

>95% of equities by holdings covered, more than half of equities by number covered, no significant errors detected

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