Climate Change, Carbon Markets and The World Carbon Fund

Presentation

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Carbon Cap Management LLP

1

Carbon Cap Presentation

Presentation Agenda

1. The Science of climate change
2. The Paris Agreement and Climate Risks
3. Carbon Pricing and Emissions Trading Systems
4. Carbon markets research and the World Carbon Fund

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2

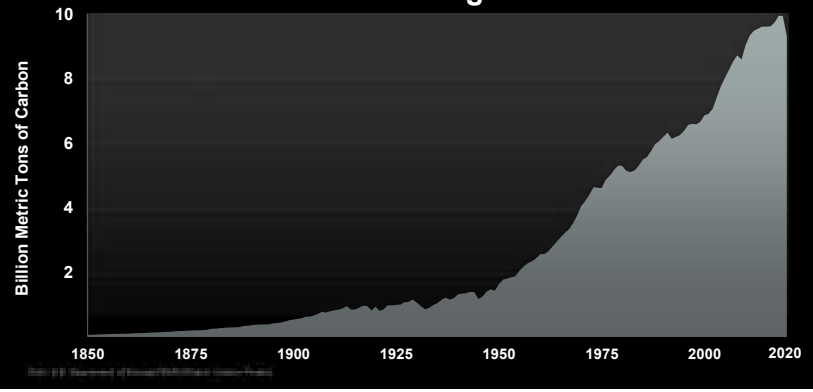
The Science

Understanding Climate Change

3

4

The Largest Source of Global Warming Pollution Is the Burning of Fossil Fuels



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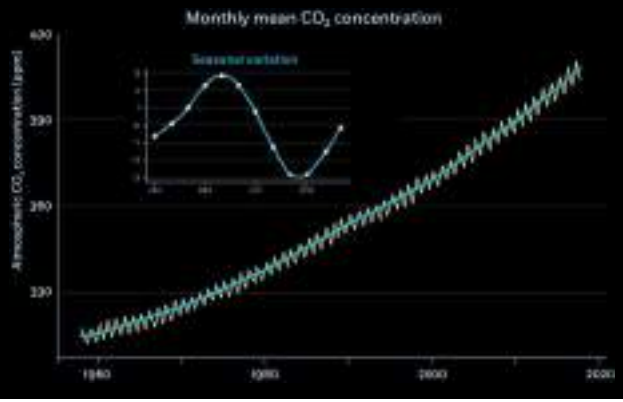
Atmospheric Concentration of CO2 is Increasing Rapidly



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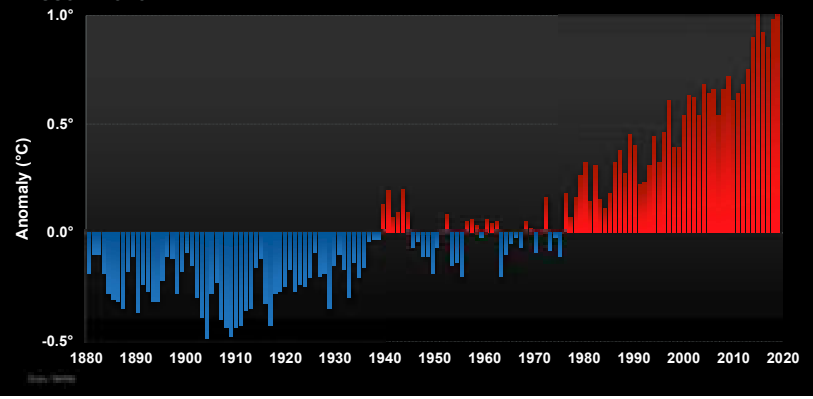
Global Surface Temperature – Departure from Average

1880 – 2020



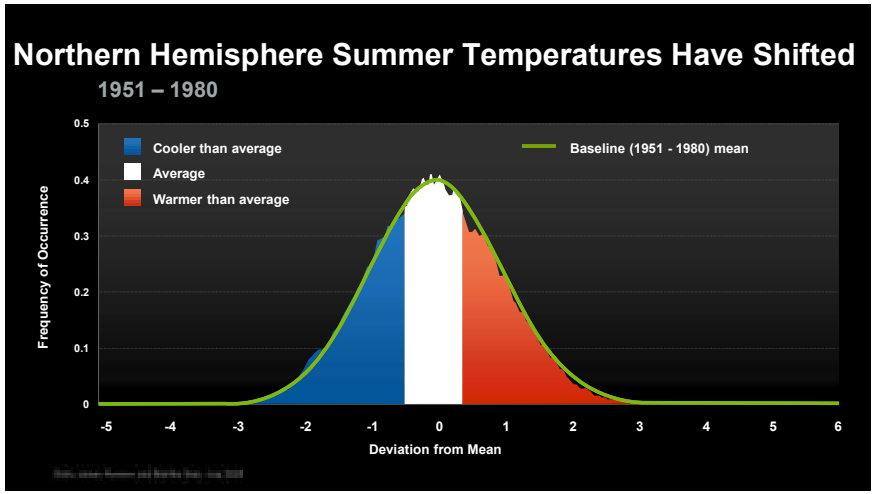
7

The 19 Hottest Years on Record Have Occurred Since the Year 2002

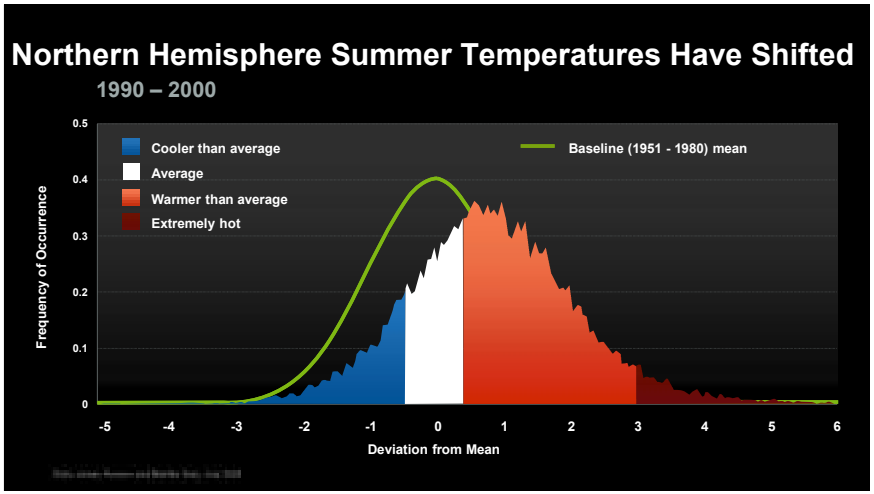
2020 2016 2019 2017 2015 2018 2014 2010 2013 2005

2007 2009 2012 2006 2002 2003 2011 1998 2008 2004

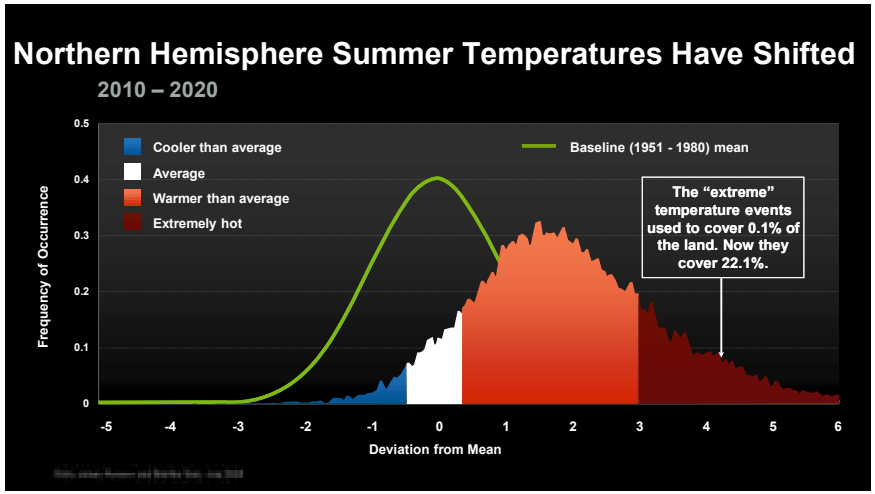
8


Northern Hemisphere Summer Temperatures Have Shifted
1951 – 1980
Cooler than average
Average
Warmer than average
Baseline (1951 - 1980) mean
Frequency of Occurrence
0.5
0.4
0.3
0.2
0.1
0
-5
-4
-3
-2
-1
0
1
2
3
4
5
6
Deviation from Mean

9


Northern Hemisphere Summer Temperatures Have Shifted
1990 – 2000
Cooler than average
Average
Warmer than average
Extremely hot
Baseline (1951 - 1980) mean
Frequency of Occurrence
0.5
0.4
0.3
0.2
0.1
0
-5
-4
-3
-2
-1
0
1
2
3
4
5
6
Deviation from Mean

10

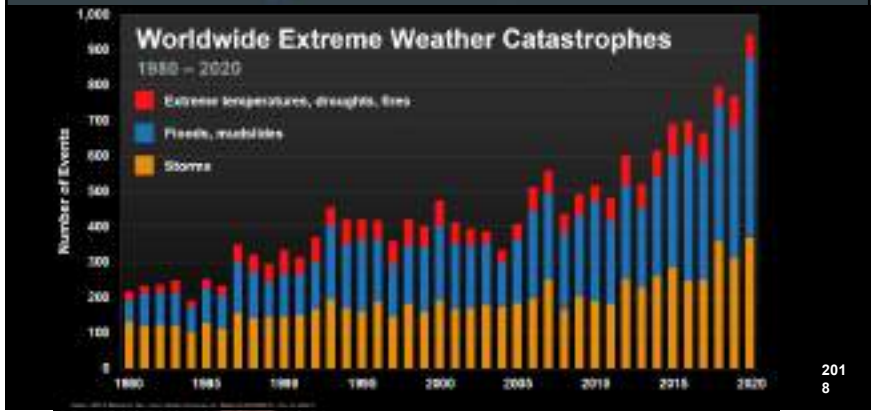

Northern Hemisphere Summer Temperatures Have Shifted
2010 – 2020
Cooler than average
Average
Warmer than average
Extremely hot
Baseline (1951 - 1980) mean
The "extreme" temperature events used to cover 0.1% of the land. Now they cover 22.1%.
Frequency of Occurrence
0.5
0.4
0.3
0.2
0.1
0
-5
-4
-3
-2
-1
0
1
2
3
4
5
6
Deviation from Mean

11

At least 364 locations around the world set all-time heat records in 2019

12

Multiple Economic Impacts Including Weather



13

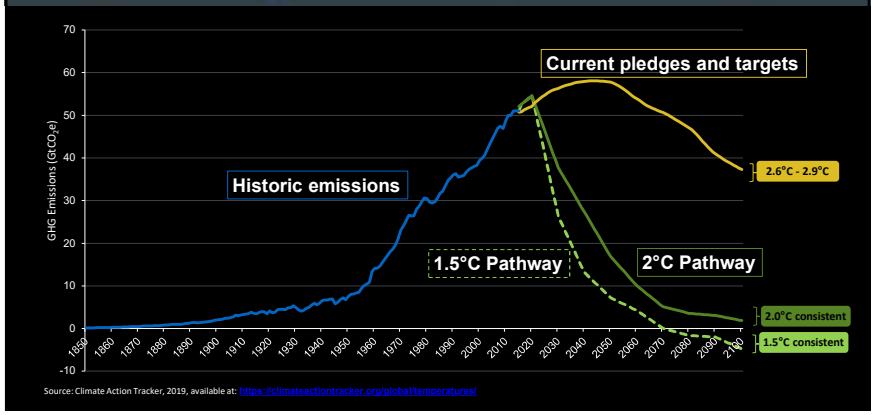
The 2 Degree Threshold

The Paris Agreement and Climate Risks

14

15

Meeting this Challenge Requires a Radical Shift



16

Carbon Pricing and Emissions Trading Systems

17

Market Based Economies Need a Market Based Solution

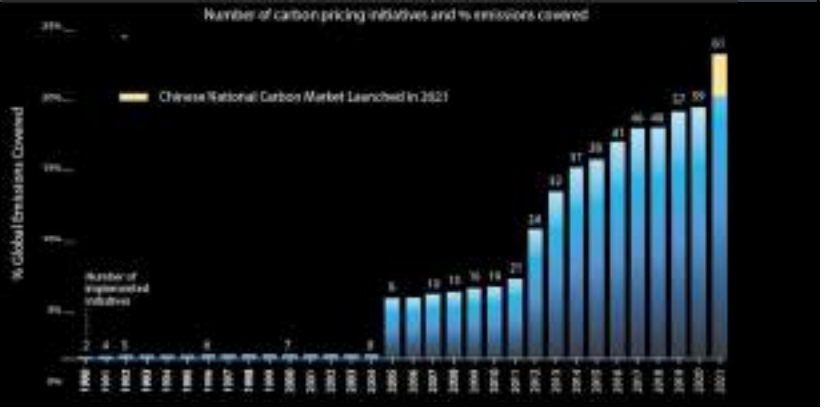
Carbon Must be Priced to Stimulate Faster Reductions

"There has never been a global movement to put a price on carbon at this level and with this degree of unison."

Jim Yong Kim, President World Bank Group

18

We are Seeing an Increase in Carbon Pricing Initiatives



19

How Does an Emissions Trading System Work?

- Mandatory inclusion for entities with emissions above a threshold
- "Carbon allowances" are allocated and auctioned. Each allowance, permits 1 tonne of CO_2 emissions
- Entities audited annually and must submit allowances equalling emissions. Penalties are severe
- Entities buy and sell allowances in the market, setting a market price for carbon
- Total supply is capped and reduced annually ensuring environmental targets achieved (cap lowered)
- Trading of carbon between emitters ensures that emissions reductions take place at the lowest cost
- A liquid market for carbon also allows hedging and incentivises innovation for low carbon technologies
- Auction revenues from the sale of carbon are used for energy efficiency and low carbon initiatives

20

Emissions Trading Systems an Efficient Policy Tool

21

Europe's Cap and Trade ETS: A Major Impact

Since 2005, Emissions in Europe are down 1 Billion tonnes/yr

Europe's Surging Carbon Price Is Helping to Speed the Demise of Coal Plants

Blow for coal power as EU carbon emissions price hits 10-year high

Rising carbon price set to push more coal off the grid

22

13 ETS in Force with 4 Scheduled and 12 in Consideration

23

The Investor

Carbon Markets Research

Academic Paper: "The Carbon Risk Premium"

24

Carbon Composite Selection and Weighting

Carbon Composite Portfolio: Equally Weighted Across 4 Markets

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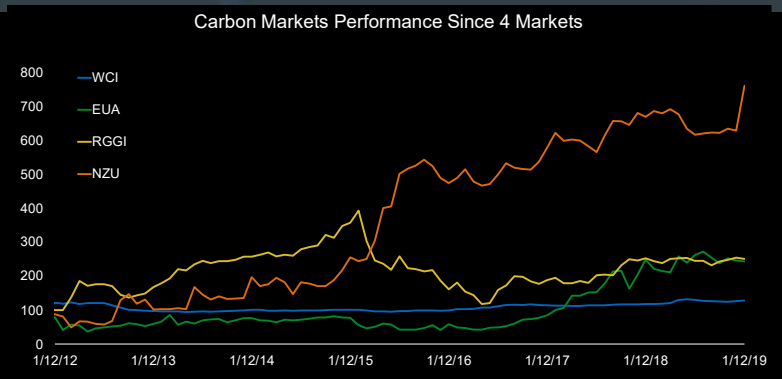
25

Each Carbon Market Exhibits a Unique Return Profile



26

Investing Across Carbon Markets Reduces Risk

Significant diversification benefits from blending markets with low correlations

Carbon Markets Since 4 Markets	Portfolio 1	Portfolio 2	Portfolio 3	Portfolio 4
EUA Carbon	100%	50%	33%	25%
WCI Carbon		50%	33%	25%
RGGI Carbon			33%	25%
NZU Carbon				25%
TOTAL	100%	100%	100%	100%
Annualised Return	19%	12%	15%	22%
Annualised Standard Deviation	53%	26%	21%	16%
Average 3 Max Drawdowns	-66%	-36%	-31%	-25%
Sharpe Ratio	0.35	0.42	0.71	1.19

*Inception date is November 2012

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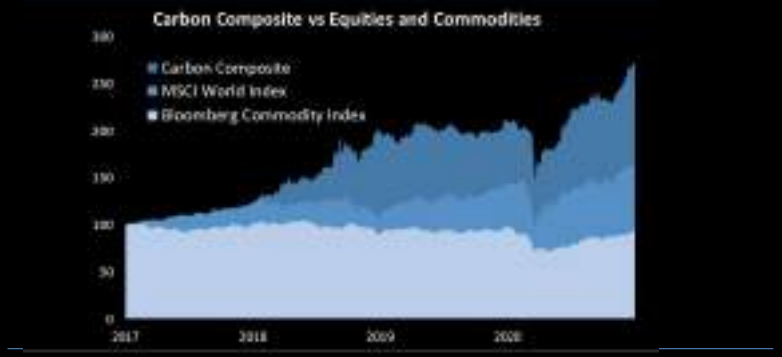
27

Carbon Composite Pro-Forma Portfolio Performance



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28

Research: Carbon Composite Portfolio

Carbon Composite Portfolio pro-forma performance 8 years to Dec 2020

	Carbon Composite	Global Equities	Global Bonds	Global 60:40	Global 54:36:10
Annualised Return	21.7%	10.7%	2.2%	7.4%	9.1%
Annualised Volatility	17.7%	14.2%	4.6%	8.4%	8.2%
Sharpe Ratio	1.19	0.76	0.47	0.82	1.04

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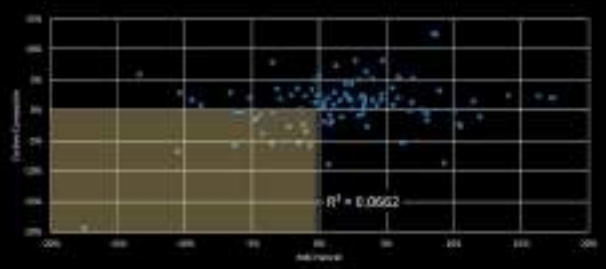
29

Research: Carbon Composite Portfolio

No correlation in monthly returns between global equities and carbon (2013 -2020)



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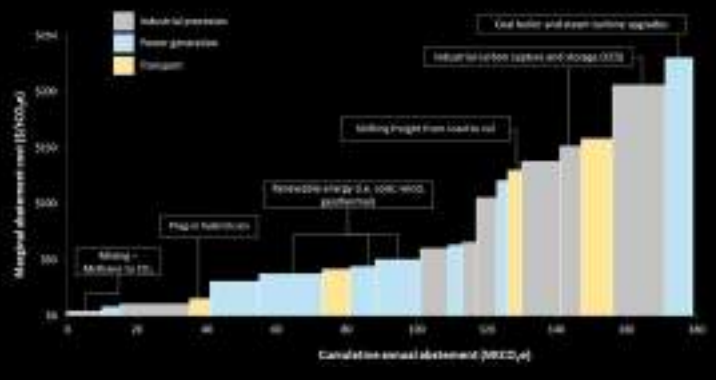
30

Abatement Costs Rise Due to Cost and Complexity

The Marginal Abatement Cost Curve Represents the Expected Costs of Emissions Reductions



31

What Carbon Price Do We Need to Meet Paris Targets

Based on the Emissions Reductions Needed for Paris, a Carbon Price can be Calculated

Carbon pricing Source	2030 Carbon Price (US$)
Stern Stiglitz Review[1]	75
IEA Perspectives for the Energy Transition[2]	120
IIASA SSP Scenarios 2 Degrees[3]	131
UK REA Bioenergy Strategy[4]	125
Average	**113**

1 **Stern Stiglitz Review:** - High-Level Commission on Carbon Prices. 2017. Report of the High-Level Commission on Carbon Prices. Washington, DC: World Bank. License: Creative Commons Attribution CC BY 3.0 IGO

2 **IEA Perspectives for the Energy Transition:** International Energy Agency. 2017. Energy Technology Perspectives.

3 **IIASA SSP Scenarios 2 Degrees:** International Institute for Applied Systems Analysis. 2019. Shared Socioeconomic Pathways (SP) Scenario Database.

4 **UK REA Bioenergy Strategy:** Brown, A. 2019. Bioenergy Strategy Phase 3: Delivering the UK's bioenergy potential. Renewable Energy Association (REA).

32

A Carbon Price of $60 to $120/t Possible by 2030

33

The World Carbon Fund

Generating Absolute Returns and Climate Impact

34

World Carbon Fund

- The World Carbon Fund targets absolute returns and a direct impact on climate change
- The fund invests into multiple liquid carbon markets holding carbon futures and options
- The team have years of experience in carbon pricing, carbon trading and portfolio management
- 90%+ of participants within carbon markets are “end users” creating alpha opportunities
- “ETS markets are now large and liquid, trading $1-2 billion per day and expanding globally
- Fund launched in March 2020 and now has 18 month track record and is +27%
- The fund is structured as an Irish QIAIF and has monthly liquidity
- 20% of performance fees used to purchase and permanently retire carbon allowances

35

Carbon Cap Management and Investment team

36

World Carbon Fund Investment Process

37

World Carbon Fund Investment Process

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38

Carbon markets scored across technicals/sentiment and fundamentals

- Quantitative scoring for indicators across Technicals/Sentiment and Fundamental Valuation categories
- Individual scores generate an aggregate market assessment score which drives strategy allocation

Illustrative Single Market Assessment

Example Indicators	Technicals and Sentiment	Fundamental Valuation	Market Structure & Policy Outlook
Indicator 1	Momentum/Reversals	Price forecasts based on supply and demand models	Supply adjustment mechanism
Indicator 2	Option Volatility skew	Energy sector dynamics	Impending regulatory changes
Indicator 3	Implied volatility	Abatement options	Overlapping policies
Indicator	....	....	....
TOTAL INDICATOR SCORE	6	8	7

Illustrative Market Assessment Scoring

Indicator Categories	EUA	WCI	RGGI
Technicals and Sentiment	8	2	1
Fundamental Valuation	5	8	7
Market Structure & Policy Outlook	7	5	6
MARKET SCORES	7	6	5
AGGREGATE SCORE	6		

Disclaimer: Above indicators reflect an illustrative sample of indicators and their scores and do not reflect past or present views of Carbon Cap

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Carbon Markets Provide Significant Alpha Opportunities

- The majority of carbon trading involves end-users seeking to hedge and/or meet compliance obligations
- Hedging behavior creates market inefficiencies and alpha opportunities

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40

World Carbon Fund Performance Since Launch

41

Climate Change: The Largest Threat to Humanity

Carbon Cap Mission Statement

Raise awareness of climate change and provide solutions directly related to the capping and reduction of carbon dioxide emissions

42

IMPORTANT INFORMATION

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Carbon Composite Portfolio returns are pro-forma simulated returns and no physical fund or invested portfolio existed. Certain assumptions have been made for modelling purposes and are unlikely to be realized. No representation or warranty is made as to the reasonableness of the assumptions made or that all assumptions used in achieving the returns have been stated or fully considered. Changes in the assumptions may have a material impact on the hypothetical returns presented.

Proforma performance results have many inherent limitations, some of which are described below. No representation is being made that any account will or is likely to achieve profits or losses similar to those shown. There are frequently material differences between hypothetical performance results and the actual results subsequently achieved by any particular trading program. The period selected had both rising and falling returns. Other periods selected may have different results, including losses. There can be no assurance that the Fund will achieve profits or avoid incurring substantial losses. One of the limitations of hypothetical performance results is that they are generally prepared with the benefit of hindsight. In addition, hypothetical trading does not involve financial risk, and no hypothetical trading record can completely account for the impact of financial risk in actual trading. There are numerous other factors related to the markets in general or to the implementation of any specific trading program which cannot be fully accounted for in the preparation of hypothetical performance results and all of which can adversely affect actual trading results."

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43

Carbon Cap Strategic Advisory Board

Neil Eckert, Founder and Chairman Incubex LLC and Aggregated Micro Power

- Chairman of IncubEx and Aggregated Micro Power Holdings and co-founder and CEO of Climate Exchange PLC until the sale of the company to the Intercontinental Exchange in July 2010 for approximately £400 million. Climate Exchange PLC owned the Chicago Climate Exchange and the European Climate Exchange which over 90% of carbon traded in the EU.
- Previously the Chairman of Trading Emissions PLC, an AIM listed company hosted and one of the world's leading funds investing in emission reduction permits. Neil founded Brit Insurance Limited in 1995 and remained its CEO until March 2005.

Professor Sam Fankhauser: Director Grantham Research Institute on Climate Change at the LSE

- Director of the Center for Climate Change Economics and Policy and a non-executive director of CDC Group, the UK's Development Finance Institution
- From 2008 to 2016 he was a member of the UK Committee on Climate Change

Mike Berners-Lee: CEO of Small World Consulting and Professor, Lancaster University

- Combines the academic rigour of a university professor with the practical experience of running a business involved in climate change.
- Mike's company, Small World Consulting, help businesses respond to climate change and the broader sustainability agenda through pioneering supply chain emissions reporting methods

Robert Jenkins, Professor & Public Policy Advocate

- Robert Jenkins is a former banker, fund manager and policy maker. He is currently a professor, board director and public policy advocate.
- Jenkins headed trading and sales for CitiGroup in Dubai, Bahrain, Switzerland and Japan. He then moved to the "buy side" where he led asset management firms in Tokyo, London and New York Jenkins chaired the UK's Investment Association, was founding chair of the AQR Asset Management Institute at LBS and Chaired the Board of Governors of CFA Institute.

Mr. James Cameron, Former Chairman, Climate Change Capital

- Founder and chairman of Climate Change Capital which grew to be a thriving merchant banking and investment business employing 150 people with $1.5 billion under management
- A member of the Prime Ministers Business Advisory Group during the coalition government and held positions as both a member of the Green Investment Bank and an advisor to the European Commission on the creation of the EU ETS
- Founded the Global Climate Change and Clean Energy practice at Baker & McKenzie, and co-founded the Centre for International Environmental Law (CIEL)

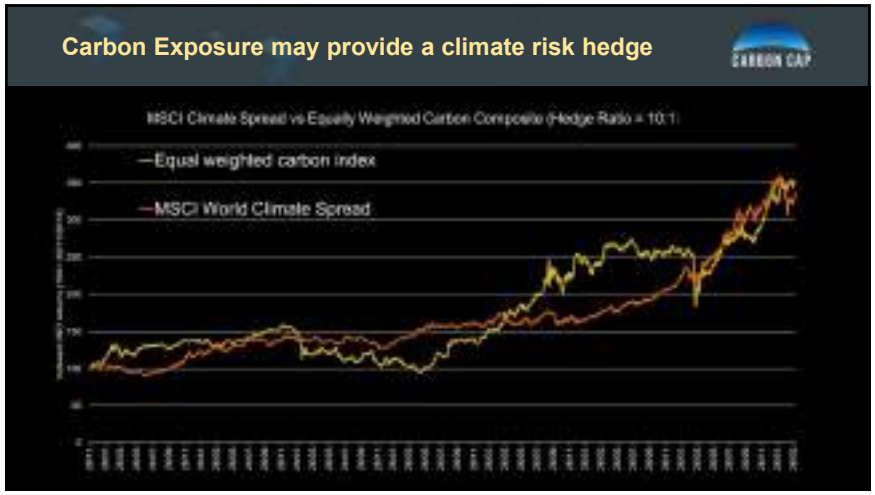
44

Saint-Tropez, France
July 24, 2017
"Right now, we are facing a man-made disaster of global scale. Our greatest threat in thousands of years.
If we don't take action, the collapse of our civilisations and the extinction of much of the natural world is on the horizon."
Sir David Attenborough

45

MSCI Climate Paris Aligned Index has outperformed
CARBON CAP
MSCI World Index Vs MSCI World Paris aligned Index
MSCI World Net Total Return USD Index
MSCI World Climate Change Paris Aligned Select Net USD
240
220
200
180
160
140
120
100
80
11/2013
11/2014
11/2015
11/2016
11/2017
11/2018
11/2019
11/2020
The MSCI Climate Paris Aligned (CPA) index takes into account transition risk, physical risk, green opportunities, and 1.5° Degree alignment
The MSCI CPA tilts away from these risks within a tracking error limit relative to the main index
The MSCI CPA vs MSCI World (The MSCI World Climate Spread) therefore provides a proxy for climate risk.

46


Carbon Exposure may provide a climate risk hedge
CARBON CAP
MSCI Climate Spread vs Equally Weighted Carbon Composite (Hedge Ratio = 10:1)
Equal weighted carbon index
MSCI World Climate Spread

47