REVIEW OF THE CONTENTS

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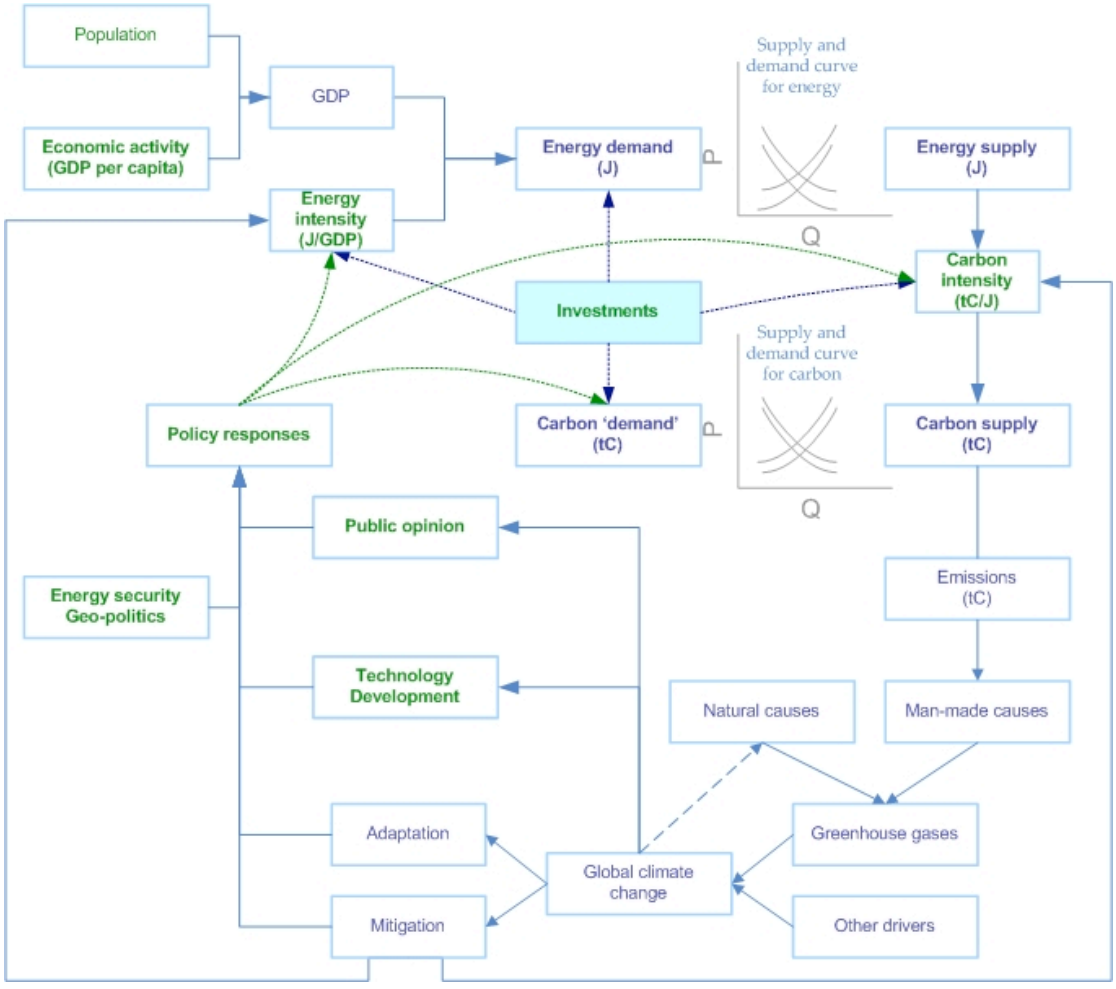
The London Accord aims to provide a reference guide for investors in climate change solutions. But no investment is made, or should be made, in isolation. Climate change, although an important driver of investment returns for the opportunities considered in the reports, does not stand alone.

We therefore needed to frame climate change in a similar way to more traditional investment opportunities – in other words, in terms of economics. But even that is too narrow: climate change investments depend for their returns on correcting the 'greatest market failure the world has ever known', i.e., a price for greenhouse gas emissions. Only that price creates a game in which climate change solutions can play and win. But that greenhouse gas emissions price (shorthand: the carbon price) exists courtesy of government and international policies like tax or a cap-and-trade market. And governments react to the climate science in setting those policies, and to public opinion and need to take into account technology options and developments and….we have a complex system where 'everything influences everything'.

The diagram is a simplified model that sets out how, for London Accord, we saw that complex system. We've tried to cover the most relevant components of that model with papers which make up the reference guide, leaving aside the fundamental climate science itself.



At the core of the diagram are the two supply and demand models, since they stand for the mechanisms that set the price for energy and for greenhouse gas emissions. Prices for energy and emissions determine the returns available to investors (along with costs). We will come back to this point at the end of this paper. The simple model in the diagram has influenced how we have chosen to organise the London Accord. The model drove our desire for broader coverage than the technologies and solutions for renewable energy, sustainable fuels or greater efficiency. Those technologies are important, and are covered in the research by the participating financial institutions. But equally important are the issues that shape the context for investments in the climate change solutions: governments and public opinion, climate science, and the big demographics of our time: population growth and economic development.

Population	Population growth drives much of the growth in demand for energy, through electricity, heat and power.
Economic activity	Rapid economic development in China, India, and other developing countries means rapid increases in GDP per capita.
GDP	GDP, the accepted measure of total economic activity, grows rapidly as a consequence of population growth and economic development.
Energy intensity of GDP	Until US/European levels of prosperity are reached, energy demand per unit of economic activity tends to grow. The key issue here is efficiency. C4: **Credit Suisse, *"Energy Efficiency: The global case for energy efficiency"*** and C5: **Merrill Lynch, *"Efficiency: The potential for selected investment opportunities"*** tackle this vast subject in their contributions.
Energy demand	Population growth and energy intensity are the two key variables driving overall energy demand.
Energy supply	The supply-demand graph illustrates that, although energy markets are heavily regulated, supply does react to demand and a market price results, albeit one that is influenced heavily by geo-political forces. B2: **Nick Butler**, "***The forces of change in the energy market***" examines those forces and how they shape policy priorities in his paper.
Carbon intensity	The carbon intensity of energy, in all its forms (transport, electric power, heat/cooling and other industrial use) is a consequences of available technologies and relative costs. Government policies, from economic incentives (tax, subsidies) to regulations (renewables targets, biofuel standards) influence this heavily. D2: **Société Générale, *"Modelling carbon intensity"*** shows how this measure affects investment returns throughout the economy. E2: **The Climate Conservancy, *"Toward a product level standard: Life cycle analysis of greenhouse gas emissions"*** considers how the carbon intensity of supply chains and use can be brought to product level and so enable improved decision making across value chains. E3: **WestLB, *"An investor's critique"*** examines the implications for investors in particular.

Carbon supply	The supply and demand for carbon is really the supply and demand of reductions in greenhouse gas emissions. The supply of abatement comes from the substitution of cleaner technologies, improvements in efficiency and implementation of projects like re-forestation. Investments in cleaner technologies and other 'climate change solutions' therefore increases the supply of abatement at a given price level, or lower the price for a given level of greenhouse gas reductions. The market mechanisms such as the European Emissions Trading System play a key part in the price/quantity discovery process that is the core of every market, and C7: **Morgan Stanley, *"Emissions trading: trends and opportunities"*** analyses how these markets are likely to develop and what that means for investors.
Carbon demand	The 'demand for carbon' is the demand for reductions in greenhouse gas emissions as expressed in measures like allowances, caps (in cap-and-trade systems like the EU's Emissions Trading System) or taxation. Caps and tax are examples of a policy response: regulating the 'demand for carbon abatement' is key to using the power of markets and innovation to achieve the goals of climate change adaptation and mitigation.
Investments	The papers on investment opportunities set out how different technologies, from wind, geothermal and solar to carbon capture and storage, compare, and what potential they offer for investors. C1: **Bank Sarasin, *"Solar energy"*** C2: **ABN AMRO, *"Investing in biofuels"*** C3: **CanaccordAdams, *"Investing in renewable energy"*** C6: **JPMorgan Chase, *"Carbon capture and sequestration"*** C8: **Cheuvreux, *"Foresty: Asset for the future"*** E5: **Sustainable Forestry Management, *"Carbon Markets: The forestry dimension"*** Investments are not made in isolation but as part of a portfolio. D5: **Mainelli and Palmer, *"A portfolio approach to climate change investment and policy"*** explains the unique aspects of incorporating climate change into portfolio analysis, using both 'carbon' and money as return measures.
Emissions	This step is included as a placeholder for the translation of different greenhouse gases into a single common measure, the 'CO_2 equivalent'. The conversion is based on the global warming potential which includes both the amount of heat trapped by a greenhouse gas and its longevity in the atmosphere.

Man-made causes Natural causes	Total greenhouse gases and their delicate balance come from natural as well as man-made sources. Importantly, if there is a feedback loop from climate change to greenhouse gases from natural causes, the rate of climate change could differ from that currently assumed. Further scientific research into climate change is therefore a potential driver of public opinion, government response etc. and investors should continue to monitor the state of the scientific modelling.
Greenhouse gases	
Other drivers	Climate change is not just driven by greenhouse gases, but other factors like change in land use play a part, too. Different surfaces reflect or absorb heat differently, and this albedo effect (the reflectivity of the Earth's surface, and of clouds and particles in the atmosphere) is an important influence on climate change. This further drives the need for investors to monitor improvements in modelling.
Global climate change	Temperature changes will vary by region, as will changes in precipitation. Regional effects may prove important in driving regional public opinion and with that, pressure on governments to act.
Adaptation	D1: **Barclays,** ***"Adaptation: Credit risk impacts of a changing climate"*** makes clear, again, how important this topic is. For lenders and investors, the way a company plans for, and responds to, climate change in all aspects of its business will increasingly become important. The possibilities and costs will also increasingly become drivers of the policy responses to the climate change issue.
Mitigation	Mitigation works in two directions: increasing the efficiency of the economy (generate more wealth with less energy) and reducing the carbon intensity of the energy supply (de-carbonising energy. The potential for mitigation and the associated costs and benefits is a key driver of the public debate and of policy responses.
Technology development	The development of cleaner and more efficient ways to generate energy, and generate wealth, will be driven by the potential impact of new and improved technologies on emissions and on costs. Most analysis of investment opportunities concentrates on the current state of technologies, with limited weight being given to future developments. E1: **J Doyne Farmer and Jessika Trancik,** ***"The dynamics of technological development in the energy sector"*** explores the performance improvements of technologies and the underlying reasons. Uniquely, the paper also looks at the particular implications for portfolio construction.

Public opinion	Public opinion is a key driver of government policy and the way climate change and its impact are perceived is therefore of great interest to investors. B1: **Alex Evans and David Steven, *"Climate change: The state of the debate"*** explores how climate change rose to prominence in 2006/7 and what factors drive the debate. D3: **Forum for the Future, *"Investments to combat climate change: Exploring the sustainable solutions"*** reminds us that climate change is not the only aspect of sustainability investors need to consider. The 'five capitals' framework presented provides an outline for thinking through the impacts of technologies on people and the environment.
Energy security	Geo-political factors have played a role in energy policy for a long time. B2: **Nick Butler, *"Forces of changes in the energy market"*** explains what role they play and how policy makers balance energy security with environmental considerations.
Policy responses	Policy responses is short for the entire suite of regulations, taxes, subsidies, measures like emissions trading markets, measurement and reporting etc. that governments use to attain desired outcomes. Clearly these measures can and do have a major impact on returns available to investors. D4: **Herbert Smith, *"Investment in low carbon technology - the legal issues"*** provides an overview of international, European and UK policy measures aimed at the mitigation of climate change. These measures affect the solutions analysed in the London Accord papers. E4: **Mainelli, Knapp and Onstwedder, *"Cap-and-Trade versus Carbon Tax: A synthesis"*** attempts to show how the debate on the best tool to create a price for greenhouse gas emissions can be reconciled.

In the executive summary we point out that there is no single 'winner' but rather, that an appropriate investment strategy is about picking the right portfolio. A portfolio which is robust under many different scenarios and produces attractive returns under scenarios which are consistent with an investor's fundamental view of the key developments.

We set out suggested criteria for assessing the investments and how likely they are to be successful. Those criteria reflect the model used here to show the coherence between the papers in the London Accord report. Investors and policy makers can follow this model, or create their own, to express their views and beliefs. The London Accord's report show how this can be done, how the complexity can be made manageable, and how action can be taken.