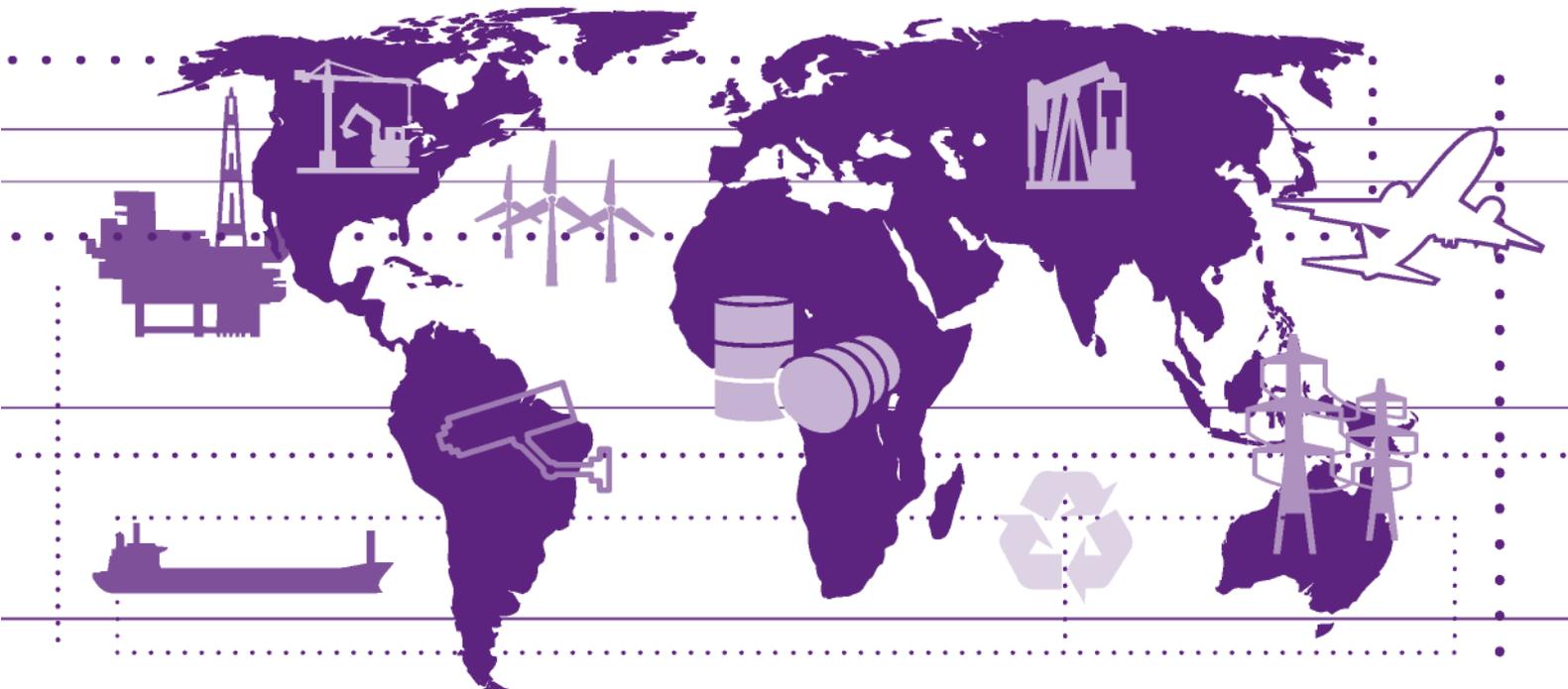




WHITE PAPER

SUSTAINABLE ENERGY SECURITY

Strategic risks and
opportunities for business



CHATHAM HOUSE

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about the author

Antony Froggatt is a Senior Research Fellow at Chatham House. He has worked on international energy and climate issues for over 20 years providing research and information for a wide range of bodies including companies, governments, the media, non-government organisations and international organisations and has published over 50 reports and papers.

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foreword

from the chief executive officer of
Lloyd's



This report, jointly produced by Lloyds 360 Risk Insight programme and Chatham House, should cause all risk managers to pause. What it outlines, in stark detail, is that we have entered a period of deep uncertainty in how we will source energy for power, heat and mobility, and how much we will have to pay for it.

Is this any different from the normal volatility of the oil or gas markets? Yes, it is. Today, a number of pressures are combining: constraints on easy to access oil; the environmental and political urgency of reducing carbon dioxide emissions; and a sharp rise in energy demand from the Asian economies, particularly China.

All of this means that the current generation of business leaders – and their successors – are going to have to find a new energy paradigm. As the report makes clear, we can expect dramatic changes: prices are likely to rise, with some commentators suggesting oil may reach \$200 a barrel; regulations on carbon emissions will intensify; and reputations will be won or lost as the public demands that businesses reduce their environmental footprint. The growing demand for energy will require an estimated \$26trn in investment by 2030. Energy companies will face hard choices in deciding how to deploy these funds in an uncertain market with mixed policy messages. The recent Deepwater oil spill shows all too clearly the hazards of moving into ever more unpredictable terrain to extract energy resources. And the rapid deployment of cleaner energy technologies will radically alter the risk landscape.

At this precise point in time we are in a period akin to a phony war. We keep hearing of difficulties to come, but with oil, gas and coal still broadly accessible – and

largely capable of being distributed where they are needed – the bad times have not yet hit. The primary purpose of this report is to remind the reader that all businesses, not just the energy sector, need to consider how they, their suppliers and their customers will be affected by energy supplies which are less reliable and more expensive. The failure of the Copenhagen Summit has not helped to instil a sense of urgency and it has hampered the ability of businesses – particularly those in the energy sector – to plan ahead and to make critical new investments in energy infrastructure. Like the authors of this report, I call on governments to identify a clear path towards sustainable energy which businesses can follow.

Independently of what happens in UN negotiating rooms, businesses can take action. We can plan our energy needs, we can make every effort to reduce consumption, and we can aim for a mix of different energy sources. The transformation of the energy environment from carbon to clean energy sources creates an extraordinary risk management challenge for businesses. Traditional models that focus on annual profits and, at best, medium term strategies may struggle. Parts of this report talk about what might happen in 2030 or even 2050 and I make no apology for this. Energy security requires a long term view and it is the companies who grasp this who will trade on into the second half of this century.

Dr Richard Ward
Chief Executive Officer
Lloyd's

executive summary

1. BUSINESSES WHICH PREPARE FOR AND TAKE ADVANTAGE OF THE NEW ENERGY REALITY WILL PROSPER – FAILURE TO DO SO COULD BE CATASTROPHIC

Energy security and climate change concerns are unleashing a wave of policy initiatives and investments around the world that will fundamentally alter the way that we manage and use energy. Companies which are able to plan for and take advantage of this new energy reality will increase both their resilience and competitiveness. Failure to do so could lead to expensive and potentially catastrophic consequences.

2. MARKET DYNAMICS AND ENVIRONMENTAL FACTORS MEAN BUSINESS CAN NO LONGER RELY ON LOW COST TRADITIONAL ENERGY SOURCES

Modern society has been built on the back of access to relatively cheap, combustible, carbon-based energy sources. Three factors render that model outdated: surging energy consumption in emerging economies, multiple constraints on conventional fuel production and international recognition that continuing to release carbon dioxide into the atmosphere will cause climate chaos.

3. CHINA AND GROWING ASIAN ECONOMIES WILL PLAY AN INCREASINGLY IMPORTANT ROLE IN GLOBAL ENERGY SECURITY

China and emerging Asian economies have already demonstrated their weight in the energy markets. Their importance in global energy security will grow. First, their economic development is the engine of demand growth for energy. Second, their production of coal and strategic supplies of oil and gas will be increasingly powerful factors affecting the international market. Third, their energy security policies are driving investment in clean energy technologies on an unprecedented scale. China in particular is also a source country for some of the critical components in these technologies. Fourth, as factories of the world, the energy situation in Asian countries will impact on supply chains around the world.

4. WE ARE HEADING TOWARDS A GLOBAL OIL SUPPLY CRUNCH AND PRICE SPIKE

Energy markets will continue to be volatile as traditional mechanisms for balancing supply and price lose their power. International oil prices are likely to rise in the short to mid-term due to the costs of producing additional barrels from difficult environments, such as deep offshore fields and tar sands. An oil supply crunch in the medium term is likely to be due to a combination of insufficient investment in upstream oil and efficiency over the last two decades and rebounding demand following the global recession. This would create a price spike prompting drastic national measures to cut oil dependency.

5. ENERGY INFRASTRUCTURE WILL BECOME INCREASINGLY VULNERABLE AS A RESULT OF CLIMATE CHANGE AND OPERATIONS IN HARSHER ENVIRONMENTS

Much of the world's energy infrastructure lies in areas that will be increasingly subject to severe weather events caused by climate change. On top of this, extraction is increasingly taking place in more severe environments such as the Arctic and ultra-deep water. For energy investors this means long-term planning based on a changing – rather than a stable climate. For energy users, it means greater likelihood of loss of power for industry and fuel supply disruptions.

6. LACK OF GLOBAL REGULATION ON CLIMATE CHANGE IS CREATING AN ENVIRONMENT OF UNCERTAINTY FOR BUSINESS, WHICH IS DAMAGING INVESTMENT PLANS

Without an international agreement on the way forward on climate change mitigation, energy transitions will take place at different rates in different regions. Those who succeed in implementing the most efficient, low-carbon, cost-effective energy systems are likely to influence others and export their skills and technology. However, the lack of binding policy commitments inhibits investor confidence. Governments will play a crucial role in setting policy and incentives that will create the right investment conditions, and businesses can encourage and work with governments to do this.

7. TO MANAGE INCREASING ENERGY COSTS AND CARBON EXPOSURE BUSINESSES MUST REDUCE FOSSIL FUEL CONSUMPTION

The introduction of carbon pricing and cap and trade schemes will make the unit costs of energy more expensive. The most cost-effective mitigation strategy is to reduce fossil fuel energy consumption. The carbon portfolio and exposure of companies and governments will also come under increasing scrutiny. Higher emissions standards are anticipated across many sectors with the potential for widespread carbon labelling. In many cases, an early capacity to calculate and reduce embedded carbon and life-cycle emissions in operations and products will increase competitiveness.

8. BUSINESS MUST ADDRESS ENERGY-RELATED RISKS TO SUPPLY CHAINS AND THE INCREASING VULNERABILITY OF 'JUST-IN-TIME' MODELS

Businesses must address the impact of energy and carbon constraints holistically, and throughout their supply chains. Tight profit margins on food products, for example, will make some current sources unprofitable as the price of fuel rises and local suppliers become more competitive. Retail industries will need to either re-evaluate the just-in-time business model which assumes a ready supply of energy throughout the supply chain or increase the resilience of their logistics against supply disruptions and higher prices. Failure to do so will increase a business's vulnerability to reputational damage and potential profit losses resulting from the inability to deliver products and services in the event of an energy crisis.

9. INVESTMENT IN RENEWABLE ENERGY AND 'INTELLIGENT' INFRASTRUCTURE IS BOOMING. THIS REVOLUTION PRESENTS HUGE OPPORTUNITIES FOR NEW BUSINESS PARTNERSHIPS

The last few years have witnessed unprecedented investment in renewable energy and many countries are planning or piloting 'smart grids'. This revolution presents huge opportunities for new partnerships between energy suppliers, manufacturers and users. New risks will also have to be managed. These include the scarcity of several essential components of clean energy technologies, incompatible infrastructures and the vulnerability of a system that is increasingly dependent on IT.