

THE LUNAR SOCIETY 2007 ANNUAL DINNER

*One Planet Living
towards a 3D energy revolution*



Rt Hon David Miliband, MP
Secretary of State
Environment, Food & Rural Affairs

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Council House, Birmingham



In a departure from his prepared speech (printed here), the Secretary of State pledged his Department's support for the Society's challenge to the city region to be carbon neutral by 2030, stating that they wanted to be "part of the solution".

In the 18th century, the Lunar Society brought together a remarkable collection of minds. Meeting on the Monday nearest the full moon, the

'Lunatics', as I understand they were known, were responsible for many of the inventions and insights that shaped the industrial age. The likes of James Watt, Matthew Boulton, Erasmus Darwin, and Joseph Priestly harnessed the power of steam, isolated oxygen, and pioneered the theory of evolution. I hope today's 'Lunatics' can play as powerful a role in shaping the next industrial revolution – what Amory Lovins calls 'natural capitalism' – as it has done in shaping the industrial era.

Today, I want to bring together the two great traditions of the West Midlands: science and commerce. I want to examine the science of climate change, and the social, economic and political challenges it poses. I then want to talk about how we can create what I call a 3D energy revolution – decarbonising and decentralising our energy supply, and decreasing demand – starting in our major cities.

Science

We are now close to a scientific consensus on climate change. The climate is changing, and it is man-made. We are, as Tim Flannery points out, 'the weathermakers'.

The scientific journey began nearly two centuries ago with the great French mathematician, Jean-Baptiste Fourier. Fourier hypothesized something in the atmosphere must be acting like the glass in a greenhouse – letting sunlight in, but trapping it – what he called 'the greenhouse effect'. Otherwise the earth would be a frozen block of ice.

In the 1890s, a Swedish chemist called Svante Arrhenius took up this theory. Arrhenius predicted that CO₂ levels would double over 3000 years if coal-burning continued at the same pace, and this would bring a hotter climate. In fact, being a Swede, he advocated more coal-burning as he thought it would bring better weather.

But though theories of global warming have a long history, since the millennium, the debate about climate change has begun to shift: from whether it is happening, to how fast we need to move to stop it.

The facts are increasingly clear.

Atmospheric carbon dioxide levels are now higher than at any time for at least the last 740,000 years. Atmospheric CO₂ is now around 40% higher than before the industrial revolution.

This has resulted in a rise in temperature at the earth's surface of 0.7 degrees in the last century, almost certainly unprecedented in human civilisation, and caused by human activity.

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The rise in temperature is likely to be partly responsible for the current rise in extreme weather in terms of heat waves, droughts, storms and floods. All of the ten warmest years since 1850 have occurred since 1990. Arctic sea ice in summer has already thinned by about 40% in the last 50 years. Climate change is a short term issue.

A doubling of pre-industrial levels of greenhouse gases is very likely to commit the Earth to an eventual global temperature rise of between 2 degrees and 5 degrees C. This will push many of the great ecosystems of the world to irreversible decline. Even if temperature rise by only 2 degrees, 15 to 40 per cent of species will face extinction.

The effects will be not just be on nature but on people too. Over 30,000 deaths were caused by the 2003 European heat wave. In future, declining crop yields, and reduced fish stocks from ocean acidification could leave hundreds of millions of people without the ability to produce or purchase sufficient food. Melting glaciers could reduce dry-season water supplies to one-sixth of the world's population. Rising sea levels could result in tens to hundreds of million more people flooded each year. Climate change is not just as Al Gore puts it, 'a planetary emergency' but a humanitarian one.

The science presents a stark warning. But is it enough to mobilise or guide action? I doubt it. As Mark Twain once put it "everybody talks about the weather, but nobody does anything about it."

To translate awareness to action, I believe we have to confront some major social, economic and political questions.

The social challenge is about values: some people question why we should have a responsibility to prevent climate change when it is future generations or developing countries that will be most affected.

The economic challenge is about cost and self-interest: Some people think climate change will be impose excessive financial costs that they are not prepared to pay.

The political challenge is about cooperation and collective action on global scale: some people think it is impossible to get the worlds major emitters to collaborate, and national action is therefore irrelevant.

Social justice

I came into politics out of a concern for social justice. When John Smith asked me to work on the Social Justice Commission in 1992, my focus was on justice between different classes in Britain. Now the

questions are global and inter-generational, between the rights of the developed and the developing world, and between our generation and the next. But the principles set out in the social justice commission can be applied to the environmental context:

First, equal citizenship rights: in a world where the threats and opportunities are increasingly global, and global institutions and agreements command more power, we must begin to think through what we mean by global environmental citizenship – the rights and responsibilities of citizens and how these are enforced through global institutions and agreement.

Second, all citizens should be able to enjoy a social minimum of environmental resources: clean air, drinking water, sufficient energy and access to natural resources to provide for basic needs, sufficient protection from the effects of climate change.

Third, equality of opportunity: we cannot deprive developing countries of access to environmental resources that prevent them enjoying the same standard of living as people in the developed world.

Fourth, fair distribution: resources that do not form part of the social minimum can be distributed unequally but fairly – according to choice or desert. For instance, a carbon trading scheme may produce different carbon footprints in different countries, but this will be based on the choices and trade-offs made by participating nations, businesses or citizens.

Economics

Science shows that action is needed. Social justice guides the principles of our response. Economics shows that we must act out of self-interest as well as altruism.

Climate change is the classic example of market failure. The cost of greenhouse gases do not accrue to the people, businesses or nations that generate greenhouse gases. The polluter does not pay. Those who fail to pay for it cannot be excluded from enjoying its benefits and free-riding on those who do pay.

But unlike many other public goods, such as air pollution, climate change is global in reach, long term in gestation, and bound with uncertainty in terms of the precise scale, location and speed of its impacts.

It is for this reason the Chancellor asked Sir Nicholas Stern to conduct a study into the

economics of climate change. The full review will be published next week. One point is clear: the financial cost of mitigating climate change will be far less than the cost of dealing with the effects and early and gradual action will be far more cost effective than sudden and late action

It is easy to be fatalistic about climate change. But paradoxically, compared with many of the challenges society faces today, the solutions are much easier to identify. We know we have the technology to increased energy efficiency and invest in low-carbon energy sources. We know that prevention will be more cost effective than dealing with a climate crisis. We also know that if we use the tools of taxation, regulation and emissions trading, we can drive investment at the scale and speed necessary.

But where I become concerned is not over the question of technology or finance, but politics.

Global framework

As the Prime Minister said last week, global emissions must peak within the next 10 to 15 years, and then begin to fall. The political window of opportunity for action is narrowing. We must start to change the terms of debate : climate change is an economic issue, a social issue, a security issue, not just an environmental issue.

Last year, we set out to get global agreement on the scientific basis for climate change and the urgency of the need to address it.

This year our aim is to promote debate about a goal for stabilising the stock of carbon dioxide in the atmosphere, and preventing dangerous climate change.

Next month in Nairobi, the long path to an international agreement on climate change begins. We are agreed it must be concluded to allow a smooth transition from the first Kyoto period. It is vital that this process is carried forward with energy and drive over the next year. There is a huge responsibility on the EU and on its Presidencies.

Alongside the UNFCCC process, the EU must be engaged in bilateral and sectoral initiatives – practical collaborations that can change the terms of debate outside the formal negotiation process. A good example is the EU-China Near Zero Coal Emissions project. If China is to meet its energy needs, we need to make carbon capture and storage – technology that can turn coal into a low-carbon energy source – commercially viable. Over the next year, we need to engage with developing and

developed countries to show that climate change is not just the most important problem facing the planet, but it is also soluble in a cost-effective way that complements all nations desire for energy security.

An UK energy revolution

Some may argue that action should be focused on international negotiations. The UK is after all just 2 per cent of global emissions.

But there is a strong case for the UK leading the energy revolution.

We are already major players in international negotiations. Without our role within the EU, the Kyoto Protocol would not have come into force. But imagine the extra leverage and influence we would have if we could go into negotiation not just as advocates for change, but exemplars – with the frameworks and investment in place, our economy firmly on a path to a 60 per cent reduction in CO2 emissions by 2050, and technologies and policies that be replicated in other countries.

There is also a more selfish motivation. If we begin to make the shift to a low-carbon economy now, it will be a smoother and more cost-effective transition than later action. And in some sectors, early action can enable us to gain a first mover advantage. For instance, as we extend emissions trading, the City of London is well placed to become the leader in a global carbon market.

Britain's cities were at the beginning of an industrial revolution that was mirrored across the world in the 18th and 19th centuries. Britain's cities can lead the way again.

Becoming a low-carbon economy will require every part of the energy-chain to change: from the electricity generators who own power-stations, the national grid and the distribution network operators who own the wires that feed electricity into our homes, the electricity suppliers who sell us energy, fuel suppliers who sell us gas to the end-users themselves – consumers and business.

Our future energy system will be based on three changes: De-carbonisation, decentralisation and decreased demand. Together, this three D revolution in energy has the potential to help us living within our environmental limits not at the expense of wellbeing and quality of life, but in pursuit of it.

De-carbonisation

90 per cent of energy currently comes from high-carbon sources: coal, gas and oil. 8 per cent comes from nuclear and 2 per cent from renewables.

Unless this mix changes dramatically in the next century, we will not be able to reduce emissions. The role of Government is primarily to address the market failures that prevent the energy sector deciding to invest in low-carbon investment.

This means creating a sufficiently high and stable long term carbon price to incentivise investment. If the cost of failing to address climate change is factored into current investment decisions, low-carbon technologies will become cost effective. The European Union Emissions Trading Scheme is the foundation. Electricity generators and other major energy users are already within a cap and trade scheme: a target for the level of emissions reductions is decided, and then allocated. If they use less than their allocation, they can choose to sell their permits. If they use more, they have to buy from those with spare. The price of these permits will vary according to demand and supply.

If electricity generators and other energy users are to change their investment decisions, they must be sure that the Emissions Trading Scheme will last long after 2012 – new investments last 20 to 30 years, so the future existence of a carbon market is critical to decisions now. But they must also be more certain that governments across Europe will act to ensure that the price of carbon is sufficiently high to make it more cost effective to invest in green technologies. That means a deeper commitment across Europe to set cap levels consistent with the EU goal of getting a 60 to 80 per cent reduction in Emissions by 2050.

Decentralisation

Since the opening of the world's first thermal power station in London in 1882 by Thomas Edison, the trend over the past century has been towards increasingly centralised power generation. Scale economies have driven the construction of large power stations and the transmission of electricity through a national grid. It is likely that centralised electricity production will always be a core part of meeting our energy needs.

But in some countries, with the emergence of new technologies we are increasingly seeing more decentralised and distributed power generation – from combined heat and power stations serving a community, to individual citizens producing energy through solar or wind power and selling their energy back onto the grid. 60 per cent of energy is typically wasted as unwanted heat by centralized generation – more than enough in total to heat every UK

home. In the next thirty years, we could see the same transformation in energy production that we have seen in computers over the past generation – with a growing reliance on small computers connected via a network rather than a traditional mainframe. For instance, a large proportion of energy in Denmark and the Netherlands is produced on a decentralised basis – a transition that took around 20 years.

The Climate Change and Sustainable Energy Act which gained royal assent earlier this year aims to ensure that electricity suppliers offer a fair price for electricity from small generators and empowers government to force all energy suppliers, through license modifications, to ensure citizens can sell energy on to the grid.

We want to go further so that energy consumers can become energy producers. As we announced in the energy review, the DTI and OFGEM are undergoing a comprehensive review of the incentive and barriers that affect distributed electricity generation. This could see a new business model for Distribution Network operators emerge: one where they focus as much on acquiring energy as distributing it.

Decreased Demand

The most cost effective route to a low-carbon economy is to increase energy efficiency and reduce demand. This is often a win-win for consumers and the environment.

But there are a number of barriers.

Citizens and business have an incentive to reduce their energy use. But the return on capital may be lower than alternative investments and they may lack the access to finance. Or the combination of inertia, inconvenience and lack of information may be the blockage.

Energy suppliers have perverse incentives. They make money from selling more energy to consumers. They do not make money from energy efficiency because the benefits do not accrue to the energy suppliers: the benefits accrue to consumers in reduced energy bills and to future generations through mitigating climate change.

We need to fundamentally change our energy system if we are to align it with our environmental goals. This will involve a revolution in how energy companies work.

Imagine a world where your energy company made money by reducing your energy use rather than increasing it. Where they actively seek out the

most cost-effective energy savings rather than waiting to be approached by customers. Where they offered you a personal carbon audit that identified energy savings in your home, your travel, and your lifestyle; paid the upfront cash needed to make savings; and even arranged for the improvements to be made from accredited suppliers.

That world is not as far away as some people think. Essentially it involves a new business model for energy suppliers. They generate value by working with consumers and enabling them to change their behaviour rather than pure cost-cutting. These organisations, known as Energy Service Companies are beginning to emerge. For instance, Woking Council has created an Energy Services Company through a public-private partnership. As a result it has reduced its own energy use by nearly half and cut its own CO2 emissions by over three quarters between 1991 and 2004, a result of decentralising its energy supplies. It also saved £4.7 million in energy and water bills over 10 years. The company also services other public sector bodies, local businesses and consumers.

Our ambition is for energy service companies to become the norm.

We want to create a shared incentive among citizens and energy suppliers to save energy. In the long term, this will mean changing the way we regulate energy suppliers. As we set out in the Energy Review, we are considering placing energy suppliers under a demand reduction obligation from 2011. They would face a cap on the energy supplied or carbon emissions from household consumers. Unless they improved energy efficiency or installed micro-generation, they would have to buy carbon allowances. This would give them a direct incentive to find ways of reducing energy demand or meeting energy needs from low-carbon heat or electricity.

But creating energy service companies will require a change of culture as well as incentives. It will require experimentation. That is why, in advance of regulatory changes, I want to model the energy service company model in our major towns and cities. We must begin to apply the energy service model within government, the public sector and business, before extending it to the household sector. The London Climate Change Agency is adapting the ESCO model developed in Woking. Over the next year, I want to work closely with each of the 8 core cities, and the RDAs, to explore the potential to set up ESCOs.

The industrial revolution was forged in our major cities. The revolution in energy will also emerge in the cities across the world. As part of the Clinton Climate initiative, 24 of the world's largest cities, including London, have pledged to reduce their greenhouse gases. Earlier this year, you raised the possibility of Birmingham and the West Midlands City-Region becoming Carbon Neutral by 2030. That is a vision worthy of this city's past, and worth of the founders of the Lunar Society.

Conclusion

Josiah Wedgewood captured the spirit of the Lunar members when he said that they were *'living in an age of miracles in which anything could be achieved'*.

We need that same spirit of optimism among today's entrepreneurs, scientists, and public service leaders if we are to create a 3D energy revolution. The challenge, as the WWF put it, is simple: one planet living. We are living today, Britons in the 21st Century, as though there are three planets of natural resources, three planets worth of capacity to absorb carbon dioxide. We must make the transition to a one-planet economy, to one-planet living, to one-planet cities. Let's start here.



David Miliband



David Miliband, MP for South Shields since June 2001, entered the Cabinet as Minister of Communities and Local Government in May 2005 - a post was created to reflect a significant increase in the Office of Deputy Prime Minister's workload. In May 2006 he moved to Defra where he replaced Margaret Beckett.

He was previously appointed Minister for the Cabinet Office on 15 December 2004 after being Minister of State for Schools from June 2002. He was previously Head of the Prime Minister's Policy Unit and Head of Policy in the Office of the Leader of the Opposition. From 1989 to 1994 he was Research Fellow at the Institute for Policy Research (IPPR) and from 1992 to 1994 Secretary of the Commission on Social Justice.

He was educated at Haverstock Comprehensive School in London before graduating with First Class Honours in PPE from Corpus Christi College, Oxford University. He completed a Masters Degree in Political Science at the Massachusetts Institute of Technology, where he was a Kennedy Scholar.

Mr Miliband edited *Reinventing the Left* in 1994, and co-edited *Paying for Inequality*. He was co-founder of the Centre for European Reform. He is President of South Shields Football Club, and a member of the Whiteleas and Cleadon Social Clubs.

He is married to violinist Louise Shackelton, formerly with the CBSO.