

THE GREENPEACE CASE AGAINST COAL-FIRED POWER GENERATION
And the case for real solutions to climate change and energy insecurity

Summary

* The single greatest threat to the climate comes from burning coal. Coal-fired generation is historically responsible for most of the fossil-fuel CO₂ in the air today, about half of all fossil-fuel carbon dioxide emissions globally.¹

* Coal-fired power generation is the most environmentally damaging means of generating electricity yet devised. In fact, in carbon terms, coal is the dirtiest fuel known to man.²

* As we close old coal-fired and nuclear power stations in the next decade we will lose capacity currently providing around a quarter of our electricity output. But Gordon Brown recently committed to targets which will require us to generate about 40% of our electricity from renewables alone by 2020, and the UK also has fairly ambitious energy efficiency targets.³ According to Europe's leading independent energy experts, Poyry, if the UK was to hit these existing renewables and efficiency targets, there will be no 'energy gap.' We can keep the lights on and cut emissions, and in the long run bring down fuel bills too - all without new coal-fired plants like Kingsnorth.⁴

* The world's most respected climate scientist, Dr. Jim Hansen, director of the NASA Goddard Institute for Space Studies, is so concerned about plans for new coal plants in Britain that he took the unprecedented step of writing to the Prime Minister to say that with the decision over whether or not to allow Kingsnorth, Brown has the potential to influence "*the future of the planet*".⁵

* Coal-fired power generation really is an outdated technology for a 21st century, climate-changing world. Even today, Britain's centralised, inefficient coal-fired power stations waste over two-thirds of the energy they generate.⁶ The proposed new coal plant at Kingsnorth, although more efficient than the old one, will still use old-style conventional technology that will waste (as heat) over half of all the energy the power station creates!⁷ Compare that with the state-of-the-art power plants they use in Scandinavia which run at up to 94% efficiency.⁸

* Burning coal in the UK has already halted the decline in emissions seen in the 1990s following the 'dash for gas' and has undermined progress from other sectors in cutting emissions. Since Labour came to power, carbon dioxide emissions have actually increased⁹ and this can be attributed in large part due to 'the roll to coal' and increased aviation emissions.¹⁰

* If Gordon Brown gives the go-ahead to a new generation of coal-fired power stations beginning with Kingsnorth in Kent, it will undermine - perhaps fatally - Britain's chances of

¹ Dr. James E. Hansen, open letter to Gordon Brown, December 2007

<http://www.greenpeace.org.uk/blog/climate/letter-to-the-prime-minister-20071219>

² IPCC Working Group III Fourth Assessment Report chapter 4 table 4.9

Supercritical coal plants emit 710gCO₂/Kwh compared to 404gCO₂/Kwh for CCGT (gas), for example.

³ The UK efficiency target is to achieve an 18% reduction in end-use energy demand against current rates of increase.

⁴ http://us.ft.com/ftgateway/superpage.ft?news_id=fto073120082322523374&page=2

⁵ Dr. James E. Hansen, open letter to Gordon Brown, December 2007

<http://www.greenpeace.org.uk/blog/climate/letter-to-the-prime-minister-20071219>

⁶ <http://www.greenpeace.org.uk/files/pdfs/migrated/MultimediaFiles/Live/FullReport/7154.pdf> (p.26)

⁷ http://www.eon-uk.com/images/Environmental_Statement_Kingsnorth.pdf

⁸ Avedore CHP power station in Denmark is run by Energie2 and runs at 94% efficiency.

www.energie2.com

⁹ DEFRA press release, 2nd July

¹⁰ <http://www.independent.co.uk/environment/climate-change/co2-emissions-targets-at-risk-from-the-roll-to-coal-442156.html>

meeting its climate change targets. If Britain is to cut its emissions by 80% by 2050, the seven planned new coal-fired plants alone would wipe out half of our 'carbon budget.'¹¹

* The decision over whether to approve the Kingsnorth plant is likely to be the most important climate decision of Brown's premiership. Opening the flood gates to new coal stations now would *lock Britain into* high levels of emissions for decades to come and signal Brown's surrender on meeting his own climate targets. Each power stations would typically operate for between 30 and 50 years and similar proposals to Kingsnorth, for unabated supercritical coal plants, are now being considered by a number of other utilities for at least another six sites: Tilbury, Blythe, Ferrybridge, Longannet, Cockenzie and High Marnham.

* The threat from a proposed new coal-fired plant at Kingsnorth in Kent is the most significant challenge to the new Climate Bill.¹² A new coal plant at Kingsnorth would emit more than 8 million tonnes of carbon dioxide every year.¹³ That's more than thirty entire developing countries combined.¹⁴

* Emissions from just the first three of the proposed new coal-fired plants would be around the same amount as ALL of the projected emission savings of an entire new nuclear programme.¹⁵ This just goes to show the government's incoherent approach to tackling energy security and climate change.

* Dr. Jim Hansen, one of the first climate scientists to warn of global warming, says:

*"The only practical way to prevent CO2 levels from going far into the dangerous range, with disastrous effects for humanity and other inhabitants of the planet, is to phase out use of coal except at power plants where the CO2 is captured and sequestered."*¹⁶

Equally, Sir Martin Rees, President of the prestigious Royal Society, wrote to John Hutton saying, *"Allowing any new coal-fired power station, such as Kingsnorth, to go ahead without a clear strategy and incentives for the development and deployment of carbon capture and storage (CCS) technology would send the wrong message about the UK's commitment to address climate change, both globally and to the energy sector."*

*"I therefore suggest that the government only gives consent to any new coal-fired power station, such as Kingsnorth, on condition that the operating permits are withdrawn if the plant fails to capture 90% of its carbon dioxide emissions by 2020. This would send a clear policy signal to industry of the need to develop and deploy CCS as quickly as possible."*¹⁷

* Claims that the Kingsnorth plant will be "ready" to adopt so-called 'Carbon Capture and Storage' (CCS) technology in the future are undermined by the evidence. "CCS" technology is still fraught with uncertainties.

¹¹ In December 2007, Gordon Brown said he aspired to an 80% cut in emissions by 2050. That would give us a carbon budget of 117.8mt/CO2/per year. The new coal plants currently proposed – 10.6 GW of capacity - would emit more than 54 million tonnes of carbon dioxide which represents almost half of that quota. (10.6 GW x 7884 hours of generation per year, assuming 90% operational = 83.57 TWH/y. 83.57 TWH/y x 0.71 = 59.34 mt/CO2/y)

¹² With the government committed to legally binding cuts of 60% in emissions by 2050, this allows a 'carbon budget' of 235.6 mt/CO2/y. The projected emissions of the new coal-fired capacity would consume about a quarter of that quota.

¹³ 1.6GW x 7884 hours = 12.6 TWH/y. 0.71 kg (carbon factor of coal) x 12.6 = 8.95 mt/CO2/y

¹⁴ CAIT, World Resources Institute <http://cait.wri.org/>

¹⁵ The Sustainable Development Commission of the UK government projected a replacement programme consisting of 10GW of new nuclear capacity would displace 6.7MtC (page 6, <http://www.sd-commission.org.uk/publications/downloads/SDC-NuclearPosition-2006.pdf>)

¹⁶ Dr. Jim Hansen, Testimony to the State of Iowa, 2007

http://www.columbia.edu/~jeh1/IowaCoal_071105.pdf

¹⁷ <http://www.guardian.co.uk/environment/2008/apr/03/fossilfuels.energy>

Even the Chancellor, Alistair Darling, told Parliament CCS is *“still in the foothills”* and *“may never work.”*¹⁸ There is no commercially operating CCS plant anywhere in the world and the technology remains unproven at full-scale.

Most experts don't expect that CCS will be commercially viable until 2020 at the earliest and even if CCS became available in that optimistic time estimate, that would still mean at least a decade of unabated new coal-fired generation, emitting millions of tonnes of CO₂ each year.

Chair of the influential cross-parliamentary Environmental Audit Committee, Tim Yeo MP, said on July 22nd, *“We cannot afford to develop new coal-fired power stations when we have no guarantee about when they would be fitted with CCS, if at all.”*¹⁹

Sir David King - the government's former chief scientist - said, *“There's little doubt that if we burn all of the coal that sits below the earth's surface, we can return the planet to the condition it was in 50 million years ago when the Antarctic was a tropical forest and much of the rest of the planet would be pretty difficult for human beings to live on...We've got to see that coal is not a useful resource to burn unless we can recapture the carbon that is produced by burning it.”*

He added of CCS, *“This is still unproven technology and I think until it's proven, it's dangerous to assume that we can continue to use coal.”*²⁰

* Both of the government's chief green advisers, Lord Smith - head of the Environment Agency, and Sir Jonathon Porritt, Chair of the Sustainable Development Commission have warned against approval for Kingsnorth.

Lord Smith said, *“My view would be that we should not go ahead with the development of a new coal-fired generation unless those [CCS] technologies are in place and we can clean up the emissions.”*²¹

Sir Jonathon Porritt wrote to Minister John Hutton attacking the plans for Kingsnorth. He told The Observer that a new generation of coal-fired power plants could, *“destroy the overall credibility of the government's Climate Change Programme.”*²²

* Gordon Brown recently committed the UK to the European deal to create 20% of Europe's energy from renewable sources by 2020. In reality this means that around 40% of our electricity in Britain would come from renewable sources by 2020. This was underlined in an exchange between the executive director of Greenpeace, John Sauven, and the Prime Minister in December 2007²³:

JOHN SAUVEN - I just wanted to push you a bit further on the EU 20% renewable energy target because I know you're waiting for the EU to report on that, probably in January. Do you accept that for the UK it will approximate at about 15% of total energy which would translate, since most of it would come from electricity, at about 40 to 45% of our electricity coming from renewable sources by 2020.

GORDON BROWN - Yes, I do accept that it would be a very demanding target for Britain and whether it's the figure that you mentioned or a figure around that figure we are going to have to change quite fundamentally.

¹⁸ 23rd May 2007, Launch of the Energy White Paper

¹⁹ <http://www.guardian.co.uk/environment/2008/jul/22/carbonemissions.carboncapturestorage>

²⁰ <http://www.telegraph.co.uk/earth/main.jhtml?xml=/earth/2008/08/01/eapower101.xml>

²¹ <http://www.independent.co.uk/news/uk/home-news/stark-warning-on-britains-shrinking-coast-900638.html?startindex=10>

²² <http://www.guardian.co.uk/business/2008/jun/29/emissionstrading.energy>

²³ Q&A session, WWF event at the Foreign Press Association, November 2007

If Gordon Brown means it, and he makes sure Britain hits its efficiency targets too, then Britain could become a world leader in clean energy and slam the door on the energy gap - and all without coal-fired power generation.

Any back-up capacity required could come from industrial CHP, which according to the independent energy expert consultancy, Poyry, could provide the same electricity output from just nine sites as eight nuclear plants.²⁴

* We know large scale renewables can be deployed and work effectively because in Germany, they already do. Germany has 200 times more solar power and 10 times more wind power than us. In 2007, Germany's renewables supplied more electricity than all of the UK's nuclear power plants combined.²⁵

* Other countries like Denmark and New Zealand, as well as states like California, have adopted 'market-friendly measures' like 'greenhouse gas emissions performance standards' to stop new coal plants without damaging their economies or energy security. The Californian economy has doubled whilst its energy consumption has stayed the same.

* Like both the Conservatives²⁶ and the Liberal Democrats²⁷, Greenpeace believes that the government should introduce tough new greenhouse gas standards for power stations. Together with WWF, FoE and the RSPB, Greenpeace is campaigning for a standard of 350g/kWh, a level which could be achieved by an efficient gas-fired power station which makes some use of waste heat. The standard should be tightened significantly if CCS technology is proven to be technically and economically viable.

* Gordon Brown must rule out coal and set a completely new industrial framework for delivering on his renewables commitments. He cannot afford to listen to the naysaying of his officials in his Business Ministry any longer. Britain needs a massive and successful renewable energy sector to compete in the 21st century.

Myth buster / FAQs:

"Carbon capture technology means that 'cleaner coal' exists and is a viable low-carbon fuel?"

Carbon Capture and Storage (CCS) technology promises to remove dangerous greenhouse gas emissions from the coal power generation process before it gets into the atmosphere. As such it has been presented as a sort of fossil-fuel Holy Grail. The trouble with CCS is that no-one knows when - if ever - it will be commercially available and deployable on any large scale. At the moment there are only a few small scale demonstration plants.

The whole CCS enterprise is loaded with uncertainties. It doesn't mean it won't happen. But it does mean we have to take a long sober look at what role we assume CCS can play in cutting CO2 in the crucial period up to 2020, when CO2 emissions need to peak.

The theoretical possibility of CCS is being used by government and industry as a smokescreen to bulldoze through new, conventional coal-fired power stations in the UK.

To be clear - Kingsnorth, and others like Tilbury, Blyth, Ferrybridge, Fiddler's Ferry, High Marnham, Longannet and Cockerzie, would each emit millions of tons of CO2 and are NOT CCS plants. They are plain, old-fashioned coal plants. There is still no such thing as "cleaner coal" - that's just greenwash.

²⁴ <http://www.greenpeace.org.uk/media/reports/securing-power> Poyry, 19th June 2008

²⁵ Working group on renewable energies – statistics, German Environment Ministry, June 2007

²⁶ <http://www.guardian.co.uk/environment/2008/jun/13/carboncapturestorage.fossilfuels1?gusrc=rss&fed=networkfront>

²⁷ <http://www.newstatesman.com/politics/2008/05/coal-power-carbon-energy>

“That’s not what the industry says.”

Well, actually, it depends who you listen to. Centrica says that conventional coal isn’t attractive as a generating technology unless CCS is proven:

“We believe that any investment in coal without carbon capture will be increasingly risky. We therefore have no current plans to invest in coal generation without carbon capture.”²⁸

Centrica share similar views to Sir David King who said to The Ecologist Film Unit:

“I think those (coal-fired) power stations are going to be priced out of the market as carbon dioxide pricing goes up. So I quite simply don’t think it’s a good private sector decision to invest in coal-fired power stations.”²⁹

Centrica again:

“Supercritical technology, while cleaner than technology at existing coal plants, does not represent the cleanest form of clean coal generation without a carbon capture and storage solution, and would still be nearly four times more emitting than IGCC technology with carbon capture. It should also be noted that several clean coal projects proposed in the UK have to date only committed to their plants being “capture ready”, rather than developing an integrated carbon capture and storage solution at the same time as the new generation plant. Almost any generation plant can be altered to capture carbon... We believe that government support for clean coal technology should be limited to those plants actually implementing carbon capture and storage, rather than capture-ready.”³⁰

Privately, E.ON is sceptical too. In an email they sent to officials at the Department of Business on January 16th 2008, the company says that CCS technology at Kingsnorth *“obviously... has no current reference for viability at any scale.”³¹*

Other industry voices that have often been supportive of CCS remain reserved about its viability. The CEO of RWE npower, Andy Duff, for example, said in June 2007:

“At this time there are still many financial, legal, regulatory, and technical hurdles to clear on CO2 transportation and storage technology.”³²

Equally, in response to local opposition to its plans to apply for a new supercritical coal plant at its site in Blyth, Northumberland, RWE npower is quoted by the local media there conceding that *“proving this technology is a long way off.”³³*

“OK, but I’ve heard some leading politicians seem pretty confident about getting it off the ground.”

Well, again it depends who you listen to. The government’s white paper on nuclear power, stated:

“By 2050 it is possible that most new coal-fired power stations will be able to deploy CCS technology...However, CCS is as yet unproven technology and we have to acknowledge

²⁸ WWF 'UK Power Giants' Report, 09/2007

http://www.wwf.org.uk/filelibrary/pdf/uk_power_giants_wwf01.pdf

²⁹ <http://www.telegraph.co.uk/earth/main.jhtml?xml=/earth/2008/08/01/eapower101.xml>

³⁰ WWF 'UK Power Giants' Report, 09/2007

http://www.wwf.org.uk/filelibrary/pdf/uk_power_giants_wwf01.pdf

³¹ Emails obtained by Greenpeace under the Freedom of Information Act - available to view at

<http://www.greenpeace.org.uk/coalsecrets>

³² Modern Power System, June 12th 2007

³³ *Another question mark on carbon* – The New Castle Journal, 23rd May 2008

*there is some risk that safe and reliable CCS for power generation might not be proven or deployable at scale and at reasonable costs. This could happen if the projected costs turn out to be too high or if it proves to be difficult to develop safe ways to transport and store CO2.*³⁴

Chancellor Alistair Darling, the former Business Minister, was equally sceptical. He told Parliament as recently as 2007:

*"Yes, carbon capture and storage, if it can be developed, would help. But at this stage we cannot be certain of that. There is no commercial scale operation of CCS on power generation anywhere in the world."*³⁵

Also the financial sector has expressed reservations about investing in coal. In America, Morgan Stanley, Citigroup, JP Morgan Chase and Bank of America said lending for coal-fired power plants will be contingent on utilities demonstrating they would be economically viable under future federal rules on emissions.³⁶

Standard & Poor's credit analyst David Lundberg:

*"Given its high costs, it (CCS) will not be economically justified in the near term, when CO2 reduction requirements are likely to be small, and other approaches to CO2 reduction will be less expensive."*³⁷

All of which is to say that maybe CCS will work and maybe it won't, but either way it won't be ready in time to deliver the immediate cuts in CO2 that climate scientists say we urgently need. For example, Lord Rees on behalf of the Royal Society has said it is essential that 90% of coal plants' carbon dioxide emissions are captured and stored by 2020 or they should be closed down.

Energy efficiency, decentralised energy and renewable energy - must be prioritized and rolled out as quickly as possible.

"Isn't there a government competition to make CCS work, or something? And isn't it true that might be at Kingsnorth?"

The government have announced that they will fund a small-scale CCS demonstration project to pilot the new unproven technology. Surprise, surprise the government says it needs a massive new coal-fired plant to do the trial on - and conveniently, Kingsnorth has been short listed to be that power plant. The government will announce the winner of its competition in early 2009. Whether or not Kingsnorth wins, the government are only talking about a tiny CCS project.

For some context, the government are talking about just 50MW of CCS by 2014 which they want to scale up to perhaps 400MW of CCS by 2020. Remember, E.ON's proposed Kingsnorth is a 1600MW coal plant! So even if they managed it, we're still talking about millions of tonnes of carbon dioxide and a whopping great coal plant that will last for decades. There will be no guarantee that they will ever scale up the CCS to cover the whole plant - or that they will close the plant in the event that CCS turns out not to work.

³⁴ para 2.80 on page 71 of the White Paper

³⁵ 23rd May 2007, Launch of the Energy White Paper

³⁶ <http://uk.reuters.com/article/environmentNews/idUKN1445731320080214?pageNumber=2&virtualBrandChannel=0>

³⁷ Global Power Report, June 7th 2007

Meanwhile, UN scientists say we've less than 100 months before global emissions need to peak and go into decline and energy experts Poyry say we can meet all our energy needs through clean, renewable sources and efficiency.

"But if China and India are inevitably going to burn coal for decades to come then we need to become a world leader in 'clean coal' technology and export it to them?"

Placing all our hope in making one unproven technology work just isn't a rational position - especially when there are real, tried-and-tested solutions like renewables, decentralised energy and energy efficiency. That's the modern, clean technology we should be exporting to the developing world.

Industrialising nations should be supported in shifting to a low carbon energy system from now - and that means efficiency, decentralisation and large scale renewables. In the case of China, there is a huge opportunity in that much of the increase in energy demand is coming from the emergence of new mega-cities. These provide ample opportunity to go low-carbon from the get-go using zero-carbon homes and decentralised networks.

It's certainly worth mentioning too that in the last year, China has been taking renewables much more seriously than the UK. The country's wind capacity grew by 156% to over 6000MW by the end of 2007. That's about 1.5 times the amount the UK has installed ever. They did it in a year!

China is now the fifth biggest user of wind energy in the world. Based on current growth rates, the Chinese Renewable Energy Industry Association (CREIA) forecasts a capacity of around 50,000 MW by 2015!³⁸

"Won't the Emissions Trading Scheme sort things out?"

The government would like you to think so but the European Emissions Trading Scheme (ETS) is already up and running and yet we have at least seven new coal plants proposed for the UK with at least three of them intended to be burning coal - unabated - by 2012 - the year that the tougher caps for emissions trading come into play. So clearly the ETS is simply not working well enough to stop new coal plants.

The danger with the ETS is more than this however because once new coal plants are built it will be hard to get rid of them. They become a high carbon cancer in the UK energy system and the UK becomes more and more locked into a high carbon energy system. That's precisely what Sir Nicholas Stern warned against. The Stern Review stated, *"It is critical that governments consider how to avoid the risks of locking into a high-carbon infrastructure, including considering whether any additional measures may be justified to reduce the risks."*³⁹

Gradually as carbon becomes more expensive the UK will get left behind, lumbered with increasing redundant technology and have less scope to change its system for the really deep CO2 cuts in the longer term. These costs will get passed onto consumers too!

By the same token we will not have taken the opportunity to develop our own renewable energy resources - having bought in credits from abroad instead - and so we'll be faced in future with buying in renewable technology from abroad and being charged over the odds for it. We will also have missed out on the industrial development and job creation that other countries who are pursuing renewables have already begun to realise.

³⁸ Global Wind Energy Council - [http://www.gwec.net/index.php?id=30&no_cache=1&tx_ttnews\[tt_news\]=139&tx_ttnews\[backPid\]=4&cHash=6691aa654e](http://www.gwec.net/index.php?id=30&no_cache=1&tx_ttnews[tt_news]=139&tx_ttnews[backPid]=4&cHash=6691aa654e)

³⁹ Stern Review on the Economics of Climate Change – Professor Jonathan Stern, October 2006

Different CCS enthusiasts have argued over the price at which the European ETS makes CCS-coal plants more cost-effective than unabated coal plants but what is clear is that nobody, except the Business Ministry, thinks that the next ETS phase will deliver a high enough carbon price.

So for example, Vattenfall believes that you need an ETS carbon price signal of between 100 and 200 euros before CCS becomes cost effective. The investment bank, Climate Change Capital, believe the price would need to be between 100 and 155 euros,⁴⁰ and Shell says between 50 and 100 euros.⁴¹ Deutsche Bank says 62 euros.⁴² In contrast, the Financial Times reported on 29th July 2008, that the price of carbon in 2012 is selling in the forward market at 30 euros.⁴³ This is nowhere near high enough to affect investment decisions sufficiently to drive the transition to a low-carbon economy.

“The only way we can keep the light on is by building new coal-fired power stations and groups like Greenpeace don’t have a solution to our energy problems.”

We do, it’s simple, it’s cheaper and it’s working in other countries. And it’s not just building wind turbines. We can keep the lights on by investing in energy efficiency, renewable energy and decentralised energy as well as using fossil fuels more efficiently than we do now.

As we close coal-fired and nuclear power stations in the next decade we will lose capacity currently providing around a quarter of our electricity output. But Gordon Brown recently committed to targets which will require us to generate about 40% of our electricity from renewables alone by 2020. The government also has efficiency targets. So if the Prime Minister is telling the truth, there is no energy gap.

Gordon Brown should put policies in place to deliver on the 33 gigawatts of offshore wind his government recently advocated and to kick-start other renewable and decentralised technologies where Britain can lead the world.

He should look to deliver super-efficient power stations on the Scandinavian model - ones which are more than 90% efficient and can use both fossil fuels and cleaner fuels like sustainably sourced biomass - and push for products and appliances that are designed to use energy more efficiently. If we do that, we won’t need new coal-fired power stations.

“But where’s the evidence?”

There are now dozens of studies, including many by government, engineering consultants, eminent academics and energy industry bodies all showing how this scale of electricity generation could be met through energy efficiency, cleaner use of fossil fuels, renewables and state-of-the-art decentralised power stations like they have in Scandinavia.

A sizable portion of the ‘gap’ could be closed through energy efficiency alone - delivering a substantial economic savings at the same time. Government figures show that there is the potential to save over 30% of all energy (not just electricity) used in the UK solely through efficiency measures that would also save more money than they cost to implement. Government puts the total saving for consumers for this level of efficiency improvement at £12 billion.⁴⁴

There are several government and industry figures published for the potential contribution from marine power - electricity harnessed from waves and tides. A conservative view based

⁴⁰ <http://ccs-association.com/docs/2008/23%20April%202008/2%20Tony%20White%20-%20Climate%20Change%20Capital%20%20%2023%20April%202008.ppt>

⁴¹ http://business.timesonline.co.uk/tol/business/industry_sectors/natural_resources/article3371862.ece

⁴² ‘It takes CO2 to contango’ report, June 2008

⁴³ <http://www.ft.com/cms/s/0/be496fb6-5cfa-11dd-8d38-000077b07658.html>

⁴⁴ <http://www.cabinetoffice.gov.uk/upload/assets/www.cabinetoffice.gov.uk/strategy/piuh.pdf>

on these, including one of the government's own studies into what could be achieved economically by 2020, suggests that 12% of UK electricity - or 1/3 of the so called 'energy gap' - could be met by marine power in the next decade or so.

According to the government, there is the potential in the UK by 2015 to generate 25% of our electricity using Combined Heat and Power with greater capacity thereafter.⁴⁵ According to energy consultancy, Poyry, there is so much industrial CHP potential in the UK that we could halve our gas imports.⁴⁶ CHP is a super-efficient way of generating electricity and using the subsequent heat that is otherwise wasted. Combined Heat and Power stations can mix efficient use of gas and coal with other types of cleaner fuels such as woodchip, straw or biogas, further reducing any reliance on gas.

John Hutton has also looked towards achieving 33 gigawatts of offshore wind.⁴⁷ The wind industry is confident that this is absolutely do-able. Their magazine, Wind Power Monthly wrote in February 2008:

"Today about 56GW of wind supplies 3-4% of Europe's electricity. That will need to move to 165 GW over the next 12 years, or 13.75GW a year. The challenge is not that great; the industry is already putting up more than 10GW in Europe every 12 months."

In 2007, the US installed 12 times more wind capacity than the UK. Spain 8 times, China 8 times, India 4 times, Germany 4 times and France - double.⁴⁸

"Aren't renewables notoriously unreliable? What happens when the wind doesn't blow?"

The operator of the current electricity national grid said, *"...based on recent analysis of the incidence and variation of wind speed, the expected intermittency of wind does not appear to pose major problems for stability..."*⁴⁹

Back up for the electrical grid already exists, because even major power stations have to come off line very rapidly in response to incidents - like safety scares at nuclear power stations such as those experienced in 2007. There is a considerable variability in the demands on the power system which grid operators are well used to managing.

The wind is blowing somewhere in Britain almost constantly. Research using meteorological records by the Oxford University Environmental Change unit showed that over a 5 year period there was no wind in Britain for only 1 hour in every 5 years. Even then other renewables like solar, wave, tidal, biomass and biogas would still be generating power, with back up from the efficient use of fossil fuels.

"Wouldn't meeting our energy security needs by renewables, decentralised energy and efficiency mean much higher fuel bills for the British public?"

Experience shows otherwise. Germany has developed a thriving renewables industry at a tiny cost to the consumer. For around £1 per month on the average household's bill, Germany now generates 14% of its electricity from renewable sources. Last year German renewables generated more electricity than the entire UK nuclear fleet. Germany also employs a quarter of a million people in the renewable energy industry - bringing huge benefits to its domestic economy. For example, according to Wind Power Monthly (February

⁴⁵ Cogeneration Directive Assessment, DEFRA, November 2007

⁴⁶ http://www.ft.com/cms/s/81acd316-3d62-11dd-bbb5-0000779fd2ac.Authorised=false.html?_i_location=http%3A%2F%2Fwww.ft.com%2Fcms%2Fs%2F0%2F81acd316-3d62-11dd-bbb5-0000779fd2ac.html&_i_referer=http%3A%2F%2Fwww.greenpeace.org.uk%2Ftags%2Fnuclear

⁴⁷ Statement from Hutton, December 11th, 2007

⁴⁸ Global Wind Energy Council, February 2008

⁴⁹ National Grid Transco, Seven Year Statement, May 2005

2008), sales of turbines, components, and other wind-related equipment to markets worldwide are expected to total some 7.4 billion euros, up from 5.6 billion euros in 2006.

In reality - it's the rocketing price of oil and gas, not the cost of renewables that explains why fuel bills are on the increase. By developing a sizeable and robust renewable energy industry we are insulating ourselves against further spikes in the cost of fossil fuels, which will become more frequent with increasing demand from the Asian economies.

As time goes on, the "polluter pays" principle will lead to fossil fuels becoming a much more expensive form of energy generation. The cost of carbon, while relatively low today, will rise within the next few years to make dirty fuels less and less economic, while renewables become much more profitable. In contrast, as mass production gets underway the cost of renewable technology will come down as it has in Germany.

Efficiency measures, which also make the target easier to achieve, will also bring bills down. A recent government report⁵⁰ estimates that the UK could save £12bn per year through proven and affordable efficiency measures. This equates to a saving of around £600 per UK household.

"Decentralised energy (DE) can't work here."

Yes it can. The government itself describes says DE *"has the potential to contribute to the energy mix and to assist with meeting greenhouse gas emission reduction targets in a variety of ways: making use of the waste heat produced through electricity generation to heat and cool buildings; reducing electricity losses through moving generation much closer to where electricity is used; reducing the need for large transmission and distribution lines with their associated environmental impact; facilitating the use of local renewable energy sources; and encouraging behavioural change through increased awareness of energy consumption."*

Decentralised energy already works on a massive scale throughout Scandinavia and Eastern Europe, for example. There are no technical barriers - only political ones.

"If we don't replace our coal plants, thousands are going to be left jobless."

The truth is that the renewables sector offers a huge opportunity for job creation whereas jobs in the fossil fuel industry simply aren't going to be sustainable in a climate-changing world.

Germany has already created a quarter of a million green-collar jobs and that's just in the past six years alone. Denmark's wind industry alone employs 20,000 and Spain's 35,000. Equally, the US employs literally millions in energy efficiency and renewables.⁵¹ As so often, Britain lags behind.

The potential for employment in renewables far out does the relatively small numbers employed in UK coal burning and experience in the US shows that renewable energy creates more jobs per megawatt of power installed, unit of energy produced, and dollar invested than fossil energy.⁵²

"We can have both coal and renewables."

⁵⁰ Cabinet Office, Performance and Innovation Unit, 2002, *"The Energy Review"*

⁵¹ Environmental and Energy Studies, Institute, Washington DC.
http://www.eesi.org/briefings/2007/Energy%20&%20Climate/11-8-07_green_jobs/EEREJobsFactSheet_11-8-07.pdf

⁵² Environmental and Energy Studies, Institute, Washington DC.
http://www.eesi.org/briefings/2007/Energy%20&%20Climate/11-8-07_green_jobs/EEREJobsFactSheet_11-8-07.pdf

This is merely a political statement. At the moment, because of the conditions the government has established, the market is stacked in favour of coal. Increasingly the government is trying to fix the conditions to make nuclear more attractive too - although at this stage its future remains risky and uncertain. We need Brown to adopt a framework which will deliver on his promise of a successful renewables industry.

A policy framework for renewables and decentralised energy would look totally different from one that supports new coal. It would, amongst other things:

- * Value the efficiency of fuel burn and low carbon heat
- * Value short supply distances so as to avoid the need for expensive transmission and distribution lines
- * Value low carbon emissions
- * Be friendly to power being sold in small amounts, and be easy for small producers to engage with.

But in practice it does none of these things. The government's system is designed to accommodate for large, inefficient and remote power stations owned by large companies like the coal and nuclear utilities such as E.ON. In other words, nuclear and coal power stand like two bouncers at the door blocking the way for renewables and efficiency - and perpetuating our outdated, inefficient and centralised energy system.

Given that no credible person supports continued unabated coal generation in the face of climate science, then the need for low-carbon energy generation seems inarguable - and the barriers almost entirely political.

"If we don't go for coal we'll be dependent for gas on unstable regimes and countries like Russia."

The real threats to our energy security come from interruptions to our oil supply. As the Government's most recent energy white paper showed, global gas supplies are becoming more varied and more stable. The UK simply isn't dependent on a handful of rogue states to keep our stoves running. For instance, we currently import very little of our gas from Russia. We do, however, need to build up strategic gas reserves, like they do in other European countries, to protect against future fluctuations in supply. It's also worth pointing out that over 70% of coal burned in the UK is imported - largely from Russia.⁵³

Proposed new supercritical coal-fired power stations include:

- 1) Kingsnorth (1600MW, E.ON, Kent)
- Approved by Medway Council in January 2008. Final decision from the Business Minister, John Hutton, has been pushed back but is now expected in autumn 2008. E.ON wants the plant able to be online by 2012.
- 2) Tilbury (1600MW, RWE npower, Essex)
- Scoping studies are underway. A Section 36 application to government is expected imminently, possibly in October 2008. The utility is aiming to construct for 2014.
- 3) Blyth (2400MW, RWE npower, Northumberland)
- Scoping studies underway. A Section 36 application to government is expected in November. Construction for 2014.
- 4) Ferrybridge (Scottish and Southern Energy, 800MW, West Yorkshire)
- Scoping studies underway. They plan to get a decision in 2010 to build and have online by 2014. *These plans replaced previous plans to 'refit' 500MW.*
- 5) Fiddler's Ferry (Scottish and Southern Energy, 800MW, Cheshire)
- At pre-application scoping stage.

⁵³ <http://www.guardian.co.uk/environment/blog/2008/aug/22/carbonemissions.fossilfuels>

6) Longannet (Scottish Power, Fife)

- The utility want to start construction in 2009 to start using in 2012. No official application yet.

7) Cockenzie (Scottish Power, East Lothian)

- Construction could start in 2009 if approved to start using in 2012. No official application yet.

Longannet and Cockenzie would have a combined output of 3390MW

8) High Marnham (1600MW, E.ON, Nottinghamshire)

- At pre-proposal stage. The energy industry journal, Platts, reported that E.ON approached local MP Patrick Mercer and local residents about replacing the existing plant which was closed in 2003.