Volume 32 Number 2
December 2015

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The value of flexibility in achieving low carbon energy Professor Goran Strbac, Imperial College

ENERGY FOCUS

Keeping the Christmas Lights on - Flexible demand?

Goran Strbac from Imperial College explains the importance and value of flexibility in supporting cost-effective transition to lower carbon energy future on Page 6

The journal of appg PGES All-Party Parliamentary Group for Energy Studies

The All-Party Parliamentary Group for Energy Studies
Established in 1980, the Parliamentary Group for Energy Studies remains the only All-Party Parliamentary Group representing the entire energy industry. We champion cross-sector energy research and development. The Group's membership is comprised of over 100 parliamentarians, 100 associate bodies from the private, public and charity sectors and a range of individual members.

Published three times a year, Energy Focus records the Group's activities, tracks key energy and environmental developments through parliament, presents articles from leading industry contributors and provides insight into the views and interests of both parliamentarians and officials.

Executive Council

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Contents

ISSN 0265-1734 For non-members, annual subscription rate is £65.00, single copies £27.00
Members receive a complimentary copy as part of membership to the Group

Printed in Great Britain by First Colour Ltd, London.

CHAIRMAN'S FOREWORD

Welcome to a new session of the All-Party Parliamentary Group for Energy Studies. There have been some changes in Westminster that I would like to summarise.

We are now an All-Party Parliamentary Group. Due to the new rules set by the Committee on Standards, there are no longer any Associate Groups. What this means to you as members is very little, except that at our AGM and EGMs, only Parliamentarians are allowed to vote. However, we intend to run our group much as before, allowing industry and academia to express their views at those meetings, so that any vote is taken based on knowledge. Memberships will continue unchanged with Associate members from industry and academia, Individual and Life members by invitation and Parliamentarians.

We use the new APPG logo and are following the new rules on publication of information, see our website **www.pges.org.uk**.

With this edition, we are resuming the publication of Energy Focus, I hope you will continue to find it a valuable source of information, with its insight in articles from our Speaker meetings, submitted by sponsors and authoritative reports, as well as the Parliamentary Record section. All-Party Parliamentary Groups have all fallen under much more close scrutiny. As PGES has always run as an open and transparent body, this presents us with no extra challenges. Our system of accounting and auditing is as exacting as in business.

On top of that, we have a new secretariat. We have opted for an individual to act as the Secretariat. Matthew Gordon, of Tamesis Services Ltd, will be our Administrator, working as the PGES. He is not new to the Group, as he has been a member for over ten years and has served on the Executive Council for many of those, so he has a real understanding of the needs of industrial and other members. I would like to thank Bellenden for running the group for the last few years. Under their watch, our membership has increased and we are financially secure. I would also like to welcome Matthew in his new role and wish him every success.

We are always delighted to hear from members, so please do share your thoughts and feedback by emailing our new editor, Matthew Gordon, at **matthew@pges.org.uk**.

Have a wonderful Christmas and New Year and I look forward to seeing you all at the annual House of Lords dinner on 1st February 2016.

Ian Liddell-Grainger MP
Chairman of the All-Party Parliamentary Group for Energy Studies

WIND ENERGY WORKS

Matthew Knight BEng, CEng, MIET, Director of Energy Strategy and Government Affairs, Siemens plc
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NOVEMBER SPEAKER MEETING: Address to the All-Party Parliamentary Group for Energy Studies

The world must stop emitting greenhouse gases. This requires fundamental changes to our economies. Every country wanting to be competitive in the low carbon world must look at the low carbon energy resources available to it. Fortunately for the UK, our latitude and geography has a great renewable resource – wind.

Air is invisible and powerful. Just an armful of air weighs a kilogram. The energy produced is proportional to the cube of the wind speed. This means that even slightly windier sites can deliver a lot more energy and wind speeds in the UK are among the highest in Europe.

Modern wind turbines build on foundations of science and engineering. Wing-like blades have replaced sails. The tip of a modern turbine blade moves at 180 miles per hour, much slower nearer the hub, hence its twisting shape. Advanced aerodynamic design more complex than that of an aeroplane wing allows these blades to start to turn in a gentle breeze we hardly notice, and survive a storm that would knock us over.

The blades on a 7MW wind turbine are twice the length of an aeroplane wing, weigh 25 tonnes and are designed to go round 150 million times. They are lighter and more flexible, yet built for less than 100th of the cost of a wing.

These blades drive electricity generators based on principles laid down by British engineers such as Faraday and Maxwell. Today, the latest permanent magnet generators are designed in Sheffield, the power converters at Keele in Staffordshire.

A modern wind turbine repays all the energy used in its manufacture in around half a year. This means wind farms have lifecycle greenhouse gas emissions less than 100th of those from a coal fired power station.

Good sites in the UK deliver load factors well over 30%, so that last year wind provided 10% of all the electricity used in the UK.

Weather forecasting means wind energy output can be accurately predicted, making it relatively easy to integrate into our electricity system. National Grid can predict tomorrow's wind power more accurately than tomorrow's electricity demand. The idea that there is spinning fossil back up for wind is just a dinner party myth. Wind works - and the cost of wind energy has fallen at least 40% each decade.

When I hear talk of "letting the energy market decide" between generation technologies, I fear a misunderstanding of how the wholesale electricity market works. There is no "natural" market for electricity. It is a set of rules that includes some costs and not others. It results in a price that is insufficient, on its own, to build ***any*** type of new power station.

Our market is a set of levers with Government on the end of some of them. Investors know that the market will deliver exactly what it is programmed to do. When that turns out not to be what Government wants, it will inevitably reconfigure the market to favour something else.

But energy investments typically take a couple of parliaments to develop, consent and build, then operate for another 5 or more. That's why political risk is so significant for energy long after the politicians have gone.

Trying to hold a "fair" competition between gas, nuclear, solar, coal and wind generation is like trying to hold a fair race between horses, camels and greyhounds. Choosing the length of the race favours one or the other. Handicapping them differently to allow them to run in the same race just slows them all down. We know we need a mixture of technologies. We should run separate races and use competition to find the best horses, the best camels and the best greyhounds. Government

has the tools to do that. What's missing is an indication of which races will be run and when.

The Committee on Climate Change recently stated that wind energy should be regarded as subsidy free below £85/MWh. That figure includes £10 to cover the cost of intermittency. The CfD auction at the turn of this year already awarded contracts to onshore wind farms at below that price.

We can expect further cost reduction. Not least if we relax arbitrary planning restrictions on tip height which would allow the UK to use technology already deployed on the continent, knocking another few pounds off the price.

What is the impact on customer bills? Payments to all existing wind farms cost the average customer around £25 last year – for that 10% of all their electricity. Polling tells us that on average people assume they pay 14 times more than this in subsidy and still onshore wind remains popular (66% support, Nov 2015).

Around 58% of that £25 headline figure came straight back to bill payers due to the "merit order effect". i.e the wholesale price is reduced when wind displaces the most expensive generation.

So the subsidies paid to wind farms in the past have brought us to the point where new onshore wind is close to subsidy free. That's exactly what subsidies were there for. New wind farms will bring down future bills.

The challenge for Government and industry is to explain that wind still needs what is known as a Contract for Difference to make up for structural features of the wholesale electricity market but that is not a subsidy.

Onshore wind works, it is popular, it is low cost and we should do more of it. In addition, this is the best place to build offshore wind but why do we need to do that as well as onshore? *There are three main reasons; reliability, diversity and scale.*

- More consistent winds offshore provide higher load factors (they generate at full power for greater periods of time). The newest offshore wind farms deliver annual load factors around 50%. Projects such as Dogger Bank have the potential to be even higher. Higher load factors reduce the cost of integrating wind into the electricity system.

- The geographic spread of offshore wind farms extends further than we could achieve on land. This increases the number of days when wind is strong enough to generate somewhere, again reducing the cost of integration.

- By 2030 we need to substantially decarbonise our electricity production. Coal will be switched off by the early 2020s and we can't allow ourselves to burn much unabated gas by 2030. That needs large scale sources of low-carbon electricity. Offshore wind farms are not constrained for size in the way they are onshore. It is hard to see any viable scenario for the UK's needs that does not involve significant offshore wind as part of a balanced mix.

Potential for further cost reduction

Offshore wind is at an earlier stage of development than onshore and the potential to get costs down further is significant. Offshore wind in the UK is barely a decade old. In that time we have gone from small projects close to shore, to huge sites well beyond the horizon. Cost reduction has come from a range of factors.

Increasing the size of offshore wind farms reduces installation time and cost per turbine. Purpose built "jack-up" installation vessels can operate in rougher weather. Companies like Siemens and Vestas have invested billions of Euros in new wind turbine designs, resulting in step-changes in cost.

For example, Siemens' 7MW wind turbine generates more than twice the energy of its predecessor, is a third lighter per MW and has half the number of parts, reducing offshore maintenance. The offshore substation used a design that saves 40% of the cost.

We know this cost reduction can continue but it requires a visible future pipeline of projects to make further investments. We know the UK will probably need offshore wind. We know we can get the cost down to a subsidy-free level by the mid 2020s, if we have a pipeline. We are waiting to see if the Government also recognises this.

Creating skilled jobs in coastal towns

The offshore wind industry is delivering significant industrial benefits too. It employs over 13,000 people in UK already and that could rise to 50,000 by 2030. The number of jobs and the speed of cost reduction will be maximised if Government is clear about future policy.

Siemens has created over 1,000 jobs in offshore wind in the last four years. We will employ a further 1,000 at the Greenport Hull site which is now under construction – if there is continuity.

Nature has blessed us with a great resource and wind is already contributing 10% of the nation's electricity. It will be a vital part of our energy future. Government needs to recognise this clearly too so that the industry can invest to bring down costs and maximise the industrial and environmental benefits.

THE ROLE AND VALUE OF FLEXIBILITY

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NOVEMBER SPEAKER MEETING: Address to the All-Party Parliamentary Group for Energy Studies

The UK electricity system is facing exceptional challenges in the coming decades. In order to achieve climate change mitigation objectives, the electricity sector should considerably reduce the carbon emission by 2030, which will be achieved through intensive expansion of the use of low carbon electricity generation technologies, such as renewables, nuclear and potentially Carbon Capture and Storage (CCS), while incorporating segments of heat and transport sectors into the electricity system.

From the system integration perspective, one major concerns is associated with degradation in generation and network asset utilisation, as wind generation and other low carbon distributed generation will displace energy produced by conventional plant, but their ability to displace capacity will be very limited. Our analysis suggests that the utilisation of generation and network will halve by 2030. Furthermore, efficient real-time demand-supply balancing with a significant penetration of intermittent renewable generation and increased contribution from less flexible low carbon generation will become another major challenge. In this context, system flexibility will be a core to facilitating cost effective evolution to lower carbon energy future. The key flexible technologies that can enhance the utilisation of the assets and efficiency of operation of future low carbon systems are: (i) demand-side response (ii) energy storage technologies (iii) flexible generation technologies, (iv) network solutions such as reinforcements and investment in interconnection, transmission and/or distribution networks (Figure 1).

In the analysis carried out on Climate Change Committee scenarios, we demonstrated that levels of flexibility would significantly affect the cost-optimal low-carbon generation mix[1]. This revealed markedly different generation mixes, depending on the level of flexibility that may be available. The optimal generation mixes for the cases of low, medium and high flexibility are shown in Figure 2 for both 50 gCO2/kWh and 100 gCO2/kWh emission targets.

We observe that with a low level of flexibility in the system the technologies chosen to deliver a decarbonised electricity system are primarily nuclear and to a lesser extent CCS. No wind or PV generation is selected as part of the optimal generation portfolio, suggesting that despite having lower levelised costs their whole-system cost is comparatively higher than that of nuclear. In the other extreme case, where a high level of flexibility is available, we observe a massive shift in the generation mix towards renewable technologies, with more than 90GW of wind and PV capacity, reflecting the reduced integration cost of renewable generation technologies enabled by enhanced flexibility. Nuclear capacity is still present, although with a far lower volume, while CCS is not selected at the assumed technology costs, given that the additional system flexibility makes wind and PV more cost-effective from the system perspective considering their reduced integration costs.

Note that in the medium flexibility scenario, reducing emissions from 100 gCO2/kWh to 50 gCO2/kWh is achieved by increasing the amount of nuclear plant capacity, while in the high flexibility scenario this would be achieved by increasing the capacity of renewable generation. Gross benefits of flexibility are reflected in the reduced cost of reaching a given emission target: cost savings of around £4.5bn per annum for 100 gCO2/kWh scenario and around £6bn per year for 50 gCO2/kWh scenario.

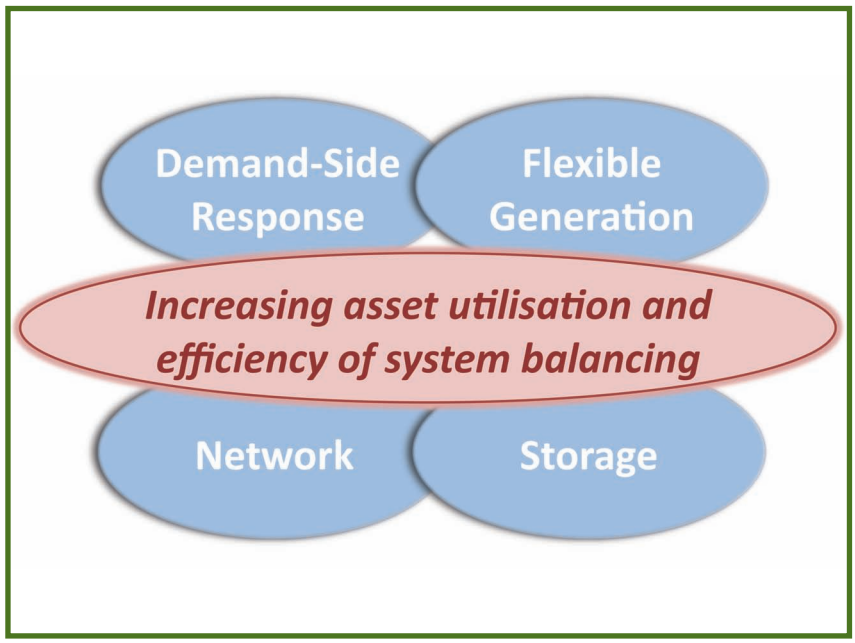


Figure 1: Flexible technologies

This clearly demonstrates that increasing system flexibility can significantly reduce system integration costs of low-carbon technologies. In this context, development of efficient market mechanism that would appropriately reward flexibility will be critically important for facilitating cost-effective decarbonisation of the GB electricity system. Further analysis carried out demonstrated growing value in flexibility for end consumers in future, as energy bills of flexible consumers may be only 30% to 50% of these for inflexible consumers beyond 2030. In other words, consumers' electricity bills in future may be very driven by the way the electricity consumed, more than by the amount of electricity consumed. In this context the integration of whole-sale and retail markets, that can be achieved by the roll out of smart meters, will be essential as end consumers will, by making choices, finally drive the development of energy industry.

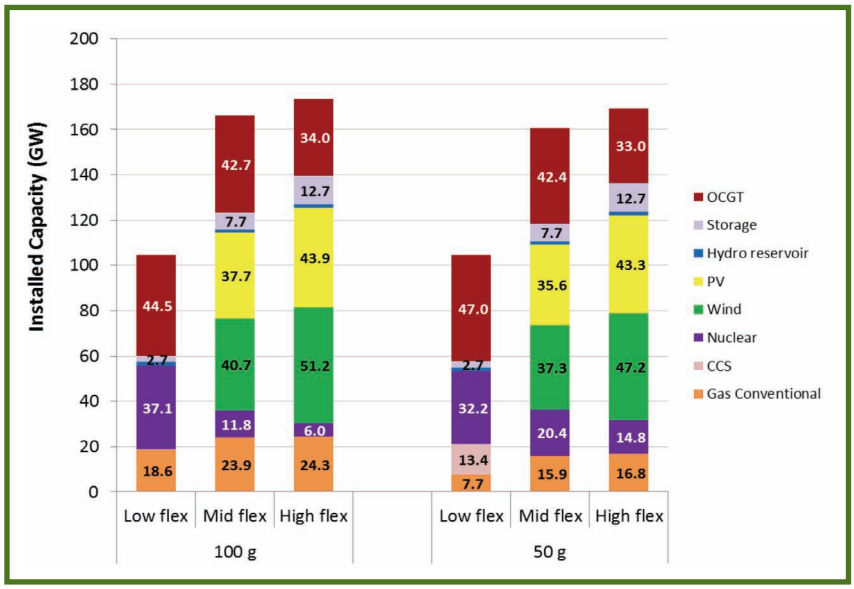


Figure 2: Impact of system flexibility on optimal generation mix for 50 and 100 g/kWh targets in 2030

1 Value of flexibility in a decarbonised grid and system externalities of low-carbon generation technologies", Imperial College, October 2015

AN INTERVIEW WITH ANGUS BRENDAN MACNEIL

(NA H-EILEANAN AN IAR) (SNP)

After six months in the Chair of the Energy and Climate Change Select Committee comprising all new members, we ask how best PGES and its Members can work with the Committee.

What are your aims and aspirations? (as Chairman)

It's been six months now since I was elected Chair of the Energy and Climate Change Select Committee, and my aims and aspirations have to a certain extent been shaped and influenced by what has happened during that period. I naturally wanted to build up a sense of trust and good relations with Committee colleagues, leading on some points, listening on others. But it's been interesting to put those aims to the test in the light of events: Government policy changes, the priorities of those in the energy sector and the interests and ambitions of colleagues. Having spent a good deal of time now with them, I'm pleased to say that the positive working relations we've built in private have led to some solid, effective question sessions in public. When I think about who's on my Committee, we've got people with interests ranging from nuclear and solar, through fuel poverty and climate change, to off-grid connections and the future of oil and gas. So I hope and expect us to capitalise on the group spirit we've already begun to develop and apply it in pursuit of those issues. There's huge potential for us to look in-depth at big policies, get ahead of the Government with certain agendas and of course act quickly to hold Ministers to account when big news breaks. In the Chair I'm keen to bring in colleagues whenever possible during public evidence sessions – building momentum but keeping contributions short and to the point. I want Members taking up each other's points and running with them. But I want the Committee to have a voice away from the horseshoe, too. So we'll be working to engage with the sector and with the public whenever we can, in seminars, visits and on social media, commenting on current issues but also pursuing some key agendas of our own. In that way I think we can really carve out an identity for ourselves as a group - bigger than the sum of its parts.

What is the direction of travel of the committee?

The Committee's keeping a watching brief on emerging changes in the department, particularly. In the light of the Secretary of State's recent 'policy reset' and her emphasis on security of supply. Secure supplies have certainly been on our agenda over the past couple of weeks, with National Grid issuing a NISM in early November. But we want to ensure that as one aspect of the trilemma is considered, the others aren't neglected. So for example when we called in National Grid in to give evidence a few weeks after that NISM was issued, we were particularly keen to explore with them the cost to consumers of maintaining power supplies, given the suggestion that the system might be open to gaming or manipulation by unscrupulous generators. What we don't want to do, however, is give the Government the chance to simply say in response to our reports or questions, "Well, we're making sure the lights stay on. That's our priority." We need to address that issue, quite rightly, but also show as constructively as we can what effect dealing with security of supply might have on affordability and sustainability. I don't want a dialogue of the deaf with Ministers. I want a positive working relationship with the Department, as well as with other Committee members.

What are his planned inquiries and how does he assess progress towards the three current inquiries?

At the moment I'm not thinking past the first three inquiries on the Committee's stocks – all chosen after extensive consultation with people and organisations in the sector. This was through a call for people's views on what the Committee's priorities should be, which yielded more than 200 written responses, and a stakeholder forum, to which we invited 60 guests. Those discussions generated three clear inquiries: on energy efficiency, investor confidence and low carbon network infrastructure. What with evidence sessions with Ministers and one-off sessions on other topics, such as security of supply and the future of oil and gas, only one of those inquiries, energy efficiency, is well underway. But the other two are beginning soon and will carry on into the new year. The Committee has yet to finalise its next programme of work, but some of the subjects currently on my mind are the fifth carbon budget, low carbon heat, energy storage, and also scrutinising and ensuring Maximum Economic Return on North Sea resources, as well as the energy implications of any possible UK exit of the EU

How can our Associate Members best be of help to you and your Committee? (Company, Academic or others)

My Committee's always keen to hear from businesses dealing with the changes the Government has announced, and we have regular briefings on key issues to keep us up to speed. We also recognise the importance of hearing from academics, giving us their view on a broad sweep of policies, or the impact of one over a period of time. We have good working relationships with a number of APPG members already, such as the Energy Utilities Alliance, the Energy Networks Association and Cornwall Energy Associates. We are increasingly looking to organise briefings on topics we're going to inquire into before we embark on public evidence sessions. Informal briefings, seminars, looking out for our calls for evidence – those are the ways in which we would hope to work with APPG members as and when we can. I'm also keen to try and get feedback from our stakeholders on how we are doing. It would be great to hear from your associate members about what we're doing well and what we could improve on. ecc@parliament.uk

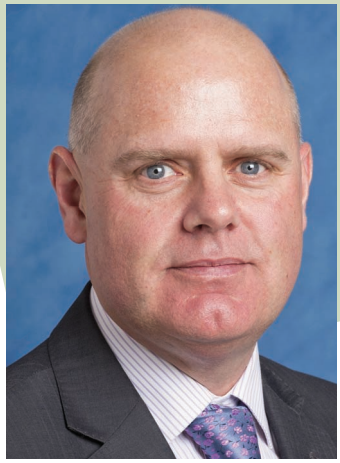
Since arriving in Westminster, what have you seen that encourages you with regards to the energy industry? (And, conversely, what that discourages you?)

The energy industry is already home to some amazing innovation. People's ability to meet the challenge of finding secure, affordable and clean replacements for fossil fuels is astonishing. And this is just the beginning. It is, as Sir David King told my Committee recently, a sector where the entrepreneurial possibilities are worth billions of pounds. But he also said, and of course I agree, that private research, development and demonstration needs a little push from public sector investment. And I suppose that is where I find the most discouragement, too. I'll reserve final judgment until the Government come forward with clear plans on how to meet our long term carbon budgets, but the fact that this probably won't happen until late next year is in itself a cause for concern, and for investor anxiety. Demand and supply-side smart tech, new infrastructure and storage innovations have the potential to create wealth and jobs - sustainably. But look at the Government's announcement that CCS, for example, won't be funded anymore. And that's before we consider how they announced it, buried in a report to the stock market on the same day as the autumn statement. I hope Ministers will be brave enough to invest in these new technologies like their predecessors did in solar and wind.

What are your expectations of the Paris COP 21 meeting?

I'm cautiously optimistic about Paris. We know Copenhagen failed because it was the culmination of a flawed top-down process, beginning in Kyoto, which Governments couldn't implement. There was also, of course, no obvious leadership from some of the major emitters. Compare that to this year, however, with the joint statement the U.S. and China issued in September. And add in more positive noises coming out of Brazil and India, and the changes in leadership in Canada and Australia, and you get a sense that the process has much more momentum this time around. It is of course the final step in a bottom-up approach, with a host of independent nations bringing their own pre-agreed plans to the table. But we know that if we add up all those plans we don't stay within the 2°C limit, so there's a lot of tough negotiating to get through over the 10 days of the Paris talks. We'll be calling in the Secretary of State on 16 December to discuss the outcomes of COP21, so between now and then we'll be keeping a close eye on developments. I have to say that whatever comes out of Paris it will not be for want of leadership by the UK on this issue. But whether given the policy reset under way, that leadership can continue through to COP22 in Morocco and beyond, well, let's see what Ministers say.

SOLVING THE CLIMATE CHALLENGE – THOUGHTS ON COP21



IChemE Energy Centre Chair and Professor of Energy Systems at Brunel University London, Stefaan Simons, explains why chemical engineering matters in transforming to a low carbon future energycentre@icheme.org

Governments and other decision-makers are increasingly becoming aware of the risks posed by climate change. Whilst the threat is very real and should not be underestimated, what decision-makers really need is expert advice on how best to respond to that threat.

The Institution of Chemical Engineers (IChemE) Energy Centre offers a source of expert information for policy-makers and decision-takers on a range of energy related challenges. The IChemE Energy Centre harnesses chemical engineering skills and methods to provide evidence-based information.

That's where chemical engineers can help. Rather than offering warnings of the dangers posed by global warming, chemical engineers can advise decision-makers on how they can solve the problem.

The IChemE Energy Centre will be publishing recommendations for action on five priority topics:

1. **Energy efficiency** with a focus on minimising energy consumption for processes; reuse of waste energy; integration with external energy providers; and development of technologies.
2. **Energy storage and grid management** with a focus on storage and smart grid technologies; and the challenges in managing power supply and demand of renewable energy generation.
3. **Carbon capture, storage & utilisation (CCSU)** with a focus on the feasibility of using CCS technology on a large scale; and bringing reality to the promise utilisation strategies.
4. **Nuclear** with a focus on New Build, advanced fuel cycles and reactor design; and waste management and decommissioning.
5. **Sustainable bioenergy** with a focus on the sustainable conversion of wastes, non-food crops and fast-growing plant-matter; and the water-energy-food nexus.

The agreement made at COP21 needs to be focused on these solutions. As we set out in the Communiqué on the next page, governments meeting in Paris need to deliver an effective agreement. Any failure to do so will have serious consequences.

Effective policy to combat climate change needs to be shaped by three guiding observations: firstly our energy, water, land, and other natural resource systems are all inter-connected and must be consider together; secondly global poverty and inequity must be addressed to ensure communities are less vulnerable to the impacts of climate change, including who should bear its cost; and finally understanding that these issues of scale, dynamics and uncertainty across the broad socio-economic-environmental-technical sphere requires comprehensive system-analytic tools to de-mystify their complexity and support decision making.

Policies to combat climate change need to be clear, long-term, coherent, and inclusive. They must be supported by regulatory regimes which are evidence-based and fit-for-purpose. The failure at previous conferences and summits to deliver anything meaningful on climate change

demonstrates that the world is in desperate need of better and more effective energy policies.

Chemical engineers can help, and the IChemE Energy Centre is the perfect vehicle to do so. Chemical engineers are:

- globally distributed and involved in all parts of the energy system
- major contributors to technology innovation and deployment
- genuine exponents of systems thinking
- champions of life cycle thinking to assess which products and processes are truly sustainable
- business leaders in key economic sectors

Chemical engineers not only understand the problem but can also provide decision-makers with the tools for mitigating climate change.

And those tools and solutions are needed now.

The IChemE Energy Centre Climate Communiqué

We know that climate change is real. Chemical engineers have the tools to mitigate it and are already helping to reduce our reliance on fossil fuels.

Human activity and climate change
The scientific case around the causes of climate change is settled. John Tyndall determined that CO_2 was a greenhouse gas in 1859. Since that time, CO_2 concentrations have risen from approximately 280 parts per million (ppm) to over 400 ppm. It has been demonstrated that our climate is warming and that human activity (through emissions of CO_2 and other greenhouse gases) is the main cause. In 2014, the Intergovernmental Panel on Climate Change (IPCC) stated that the evidence of anthropogenic emissions of CO_2 and other greenhouse gases causing climate change was unequivocal[1].

Risks of inaction
The risks posed by climate change, though complex, are sufficiently well understood to justify action. To date, however, we have not responded appropriately to the gravity of the threat. Indeed, since the IPCC's formation in 1988, numerous conferences and summits have been held on this issue but little has been achieved. In the same period, atmospheric CO_2 concentrations rose from 350 ppm to over 400 ppm.

The lack of action at previous conferences and summits means that, at the climate talks in Paris, governments need to reach an effective, global agreement. Any failure to do so could have serious adverse effects on human wellbeing and the natural world.

Responding with what we have to hand
Responding to the climate challenge is actually very simple. Globally, we derive more than 80% of our energy from fossil fuels, which currently results in vast amounts of CO_2 being emitted into the atmosphere. We need to stop doing this.

In fact, we already have the technologies needed to achieve the target of limiting atmospheric CO_2 concentrations to 450 ppm. Referring to Pacala and Socolow's concept of "stabilisation wedges"[2], adopting existing approaches to energy efficiency and conservation, fuel switching, renewable energy and energy storage, on a widespread basis across all sectors (including transport and the built environment), when combined with carbon capture and storage (CCS), nuclear power and improved land management and afforestation, will decrease, and then remove, our reliance on fossil fuels.

While fundamental research continues to be important, it is vital that we rapidly scale-up the use of existing technologies. All technologies – from renewables to CCS and nuclear – will need to play a part in decarbonising the global economy. The choices to be made in deciding between them are complex; in making these decisions, system-scale costs and interactions have to be fully considered and properly accounted for.

Meaningful action
For these technologies to be adopted on a widespread basis, governments need to reach an agreement at COP21 that provides the clarity, certainty and incentives to allow businesses, communities and individuals to act.

Governments, in any agreement, have to commit to a long-term carbon target – the UK is alone in the world in having a 2050 goal, whereas other countries look forward in intervals of only four to five years. Governments need to provide confidence in the long-term reliability of these targets – changing course every four or five years is profoundly unhelpful. Any agreement should also specify mechanisms for achieving these agreed targets, including a global carbon pricing system, offset agreements between governments and provisions enabling technology transfer.

If such an agreement can be reached in Paris, then the mitigation of climate change is a realistic goal.
Our message is simple: *we must mitigate climate change and chemical engineering is part of the solution, but we must act now.*

1 Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, IPCC, 2014.
2 Pacala and Socolow, Science, vol 305, 5686, 968–972, 2004.

CORNWALL ENERGY ANALYSIS OF RESET

System reboot – DECC seeks to "reset" energy policy

On 18 November energy and climate change secretary Amber Rudd finally set out her vision for the future of the energy market. Billed as a "reset", the speech was well-timed, just ahead of the climate talks in Paris, and some major decarbonisation announcements were therefore anticipated. But against the fiscal constraints imposed by Treasury, policies would need to be frugal.

What emerged was a much more fundamental shift in direction than that represented by the tinkering with Electricity Market Reform, and Rudd should be credited with attempting to set out a definitive and lasting policy agenda. But, as we set out in this *Energy Perspective*, it is as yet unclear that the appropriate balance is being struck between available and emerging solutions to achieve the reshuffled policy objectives.

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Most important among Rudd's announcements was the constraining of unabated coal after 2023, before the closing of all coal plant in 2025. Before the speech, confusion on the precise timing of coal closures was serving to dampen new build price signals to other plant. But it is true that in general the long-term outlook for coal plant has become less attractive. The UK's carbon price support – whilst frozen from now on – has bitten into margins, and there is the prospect of rises in the EU Emissions Trading Scheme prices as a result of the implementation of the Market Stability Reserve in 2019.

But coal plant owners seeking to come under the Transitional National Plan (TNP) in the *Industrial Emissions Directive* (IED) have still been non-committal on when or if they will close for several years. The government will hope that placing a firm deadline on closure will crystallise the intentions of coal plant operators this side of 2020. Returns on investment for IED compliance before 2020 would previously have been based on repeatedly securing a decent capacity market price and the coal plant delivering power well beyond 2025. Our calculations show that a capacity market price between £20/kW-25/kW in the period to 2030 would have been sufficient to breakeven on IED compliance on current spread expectations.

With closure in 2025, IED payback periods will be shortened and perhaps become unviable. Thus, we can expect coal plant owners to think hard about closing ahead of 2020, and perhaps not participating in any other capacity market auctions. This policy has an air of retrospectivity. It creates a very specific problem for coal plants that already have sunk costs into IED compliance. In addition, coal plant that secured three-year agreements in the last capacity auction must think about whether they should untangle themselves from their commitments.

There is also one major caveat to the announcement: the policy will only be pursued if there is confidence that new build gas can take up the slack. The thread of hope offered to the coal fleet by this caveat is that, if enough of them delay closure for long enough, it may prevent CCGTs from coming through. Perhaps government could yet be convinced that closing all of them down is a bad idea. Taking all factors in the round that would be a gamble.

A less audacious gamble for coal plant is to play on the short-term security margin concerns. If the coal plant fleet now does, as we expect, face accelerated rates of closure, it could put undue pressure on security margins before the end of the decade. Coal plant on the cusp of closing as a result of this policy decision might well be benefiting from the panic this will create in government and the pressure it places on National Grid to procure a greater share of meeting peak demand through Supplemental Balancing Reserve (SBR), potentially running it alongside the capacity market in the latter years of this decade. This is not cost free to other market participants, particularly given SBR finds its way into the cash out price as a £3000/MWh value of lost load – a cost that would ultimately find its way back to the consumer.

Hard drive

But the prospects of success for developers for new build CCGT, whilst improved, are not yet guaranteed. New-build CCGT has moved from a "catch 22"––uncertainty on when the price signal will come from coal closures––to chicken and egg. They cannot build to allow government to close coal plant unless they get the price signal, but they won't get the price signal until coal plant closes. It is possible that clean spark spreads could respond through higher wholesale electricity prices if we see coal plants close in the next few years as a result of the policy. The risk is that this alone may not provide an early or big enough signal for new build gas to substitute for closing coal, so risking supply security.

The other instrument of delivery is the capacity market. DECC said it would review this next year if we do not see new build CCGT come through in the 2015 auction. Based on our model, even if all pre-qualified coal plant owners were deterred by the new policy and priced themselves at the maximum price-taker level of £25/kW, we still would not see a new build CCGT gain an agreement. Whilst auctions would be tighter going forward, there would be no guarantee that new build CCGT would benefit. The slack could be filled with new interconnectors and––more problematic for the new policy objectives––embedded diesel.

So, we think DECC will be reviewing the capacity market next year to see how new build CCGT can better be incentivised. The department might find itself constrained by EU state aid rules if it thinks changes are necessary that positively discriminate in CCGTs' favour––such as ring-fencing a portion of the auctioned capacity for CCGT. There are a number of other options, such as changing the security standard, adjusting de-rating factors for efficiency or emissions performance, reviewing the auction price caps and thresholds, or looking at capacity market agreement length. But not all of these are easy to rationalise objectively; some are complex to implement, some have possible negative consequences for cost and security of supply, and may well risk falling foul of legal challenge in any event.

If state aid risk were considered a real problem, then a range of more subtle actions might be considered––such as looking at how the Emissions Performance Standard could be better utilised. The absence of detail or commitment to change the capacity market in Rudd's speech suggests various options are under consideration.

However, a fundamental question remains. To meet carbon reduction targets, the presence of large swathes of unabated gas is far less desirable in 2030 than 2020. But who will invest in plant that might only have a decade or so before it becomes the next focus of policy reengineering unless they can get their returns before that happens?

Core processor

Unsurprisingly, Rudd's speech was robustly supportive of plans to deliver a fleet of new nuclear power stations. The issue now for other non-nuclear participants is at what stage the new plant will be impacting the merit order and how big a slice of the limited budget for low-carbon projects these plant will demand.

The answer to the latter issue is relatively easy to predict: the scale of the projects will create a large budget pull, even if strike prices come down for nuclear power over time. The answer to the former question is much more challenging given the track record of delay for comparable projects in Europe. How government will deal with this through reserving portions of the Levy Control Framework (LCF) in the future will be an important consideration: holding back money for projects that ultimately deliver late will squeeze out other technologies. But, with Hinkley Point C now being more realistic about its delivery timetable, this an issue for the LCF beyond 2025, and not before.

Plug-ins

New CCGT and nuclear power are critical to providing baseload production at a scalable level. Gas is equally essential for delivering flexibility. But proponents of energy storage and demand side response will be concerned. A devil's advocate would say that the government is prepared to pick and financially back winners on the generation side, but on the demand side it is largely left up to the market to deliver. It does seem like the demand side is continuing to suffer from a lack of government ideas about how to unleash its potential.

For example, arguably, the storage industry seems to be nearing the same point renewables was in the early 1990s––where financial stimulus could unleash significant deployment. The difference being that through intermediating and creating efficiency between production and demand, the system benefits of a storage revolution will be more profound than the previous renewables equivalent. A light touch is great assuming that the market is functioning well. But the government accepts that this is not the case.

CONTINUED...

Num lock

The speech did send encouragement to the offshore wind sector – announcing three CfD auctions, the first of which at least will be focused on the "less established" technologies. Rudd also set out an ambition to add a further 10GW of offshore wind in the 2020s to the existing tally of 10GW (by 2020). These are really very encouraging statements, and should hopefully dovetail with expected announcements on the post-2020 to arrest attrition in the offshore market for the better projects.

But the gauntlet has been thrown down on support costs, with the figure £100/MWh in 2020 being the level the industry must meet or beat to access a CfD. The first test of this is likely to be a CfD auction at the end of 2016. We wonder if DECC might impose a lower administered strike price cap for offshore wind auctions to drive the trajectory towards a levelised cost of £100/MWh. There is an obvious risk of forcing the pace. Whilst the supply chain and developers will try to respond, forcing prices too low increases the risk that projects ultimately do not deliver.

To counter this risk, DECC may consider introducing more direct financial incentives into the CfD completion obligations than is currently the case, increasing the costs to developers and barriers to independents.

Recycle bin

No such hope has been offered to established technologies like solar and onshore wind. Rudd mentioned an ambition for 12GW of solar by 2020, which will installed under sun-setting of the RO and possibly the small-scale feed-in tariff. Later in the day, the *Solar Power Portal* quoted a DECC spokesman saying that solar and other established technologies would not feature for at least the CfD auction at the end of 2016, and the prospects beyond that look slim.

Some argue that not subsidising the cheapest deployable technologies while supporting more expensive ones is poor value for money. Counter arguments include the purpose of subsidy to pull through technologies to commercial levels. Moreover, because they are intermittent, claims of solar and onshore wind being cheap are a mirage once system costs are factored in. But we think any approach to deliberately imposing system balancing action costs on a specific type of generation would be wrong. It also ignores the fact that energy imbalance costs are largely passed through to most intermittent generators in the form of PPA discounts.

The real shame is that no "half-way" house has been found that allows support to established projects to continue in the short term. There have been various models presented for "cost-neutral" CfDs. Adapting the CfD for solar and onshore wind to a one-way contract that delivers a "floor price" designed to cover a generic project's fixed capital, operating and debt financing costs could have provided a politically acceptable route to continue to support these projects. Resulting strike prices would be much lower under such a structure, with government capping auction bids at a "floor' level" representative of fixed costs, and running an auction for cheapest bids in the normal way.

System encryption

So the motherboard of the new energy system will be low carbon, absent of coal but with more CCGT and nuclear power, with offshore wind the sole element of new scale renewables deployment. But the system planning on generation contrasts with a less prescriptive, laissez-faire attitude to innovation on the demand side.

The transition to this world is a cautious one, predicated on some fundamental dependencies: that gas can come forward to substitute coal, and that offshore wind can meet cost targets. Government can play a large role in navigating through these constraints with a reformed capacity market and an amended CfD respectively. But here the details are so far slight, and for the capacity market in particular there appear no obvious and easily implemented answers.

More philosophically, a lighter touch is to be commended. But the fear remains that, in failing to be instructive enough on just who, when, what and how storage and the demand side will contribute to the new system, the prospectus is too short-sighted and short term. It still risks relying on decoding the energy system issues of tomorrow with the hardware of today.

EXTRACTS FROM THE QUEEN'S SPEECH

27th May 2015

Energy Bill - "Measures will be introduced to increase energy security."

The purpose of the Bill is to:

- Ensure there will be affordable and reliable energy for businesses and families.
- Give the Oil and Gas Authority (OGA) the powers it needs to become a robust, independent and effective regulator, and enable it to maximise the economic recovery of oil and gas from UK waters.
- The Bill would formally establish the OGA as an independent regulator, which would take the form of a government company, charged with the asset stewardship and regulation of domestic oil and gas recovery.
- The Bill would transfer the Secretary of State for Energy and Climate Change's existing regulatory powers to the OGA as well as additional powers including access to company meetings; data acquisition, retention and transfer; dispute resolution and sanctions.
- This, in effect, would devolve powers out of Whitehall by transferring the existing consenting powers, in relation to onshore wind, to local planning authorities, so that in future the primary decision maker for onshore wind consents in England and Wales will be the local planning authority. These changes will be supported by changes to the national planning policy framework to give effect to the manifesto commitment that local communities should have the final say on planning applications for wind farms.

Wood Review Implementation.

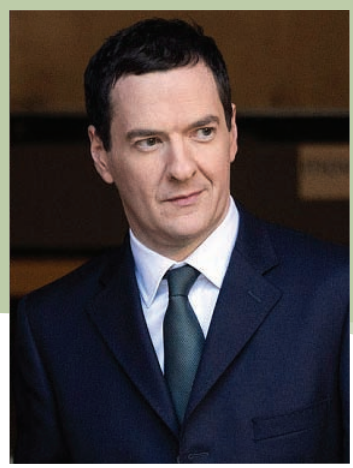
The substantive provisions would extend to England and Wales, Scotland and Northern Ireland. For the purposes of implementing the Wood Review, they will apply to the UK's territorial waters and the UKCS. The provisions will respect the relevant devolution settlements. The intention is that the licensing of onshore exploration and extraction of oil and gas will be devolved in respect of Scotland and Wales. The Government will consult with the Devolved Administrations on changes to subsidy regimes for onshore wind farms.

Energy Security - "Measures will be introduced to increase energy security."

The UK is one of the most energy secure countries in the world. The Government is committed to keeping the lights on and powering the UK economy. To ensure secure supplies in the medium term, we are investing in new energy infrastructure and we have a capacity auction which will ensure security of electricity supply from 2018/19 onwards. A further measure to be introduced is:

- Delivering more secure and diverse energy supplies in the UK, through the proposed Energy Bill (see establishment of Oil and Gas Authority)
- Ensuring we have a resilient power supply in the event of major disruption, regardless of whether it is due to cyber-attack or any other cause;
- Addressing issues of electricity supply and demand. We ran a successful capacity auction last winter which brought forward new investment at good value for money; and National Grid's New Balancing Services meant we maintained a healthy capacity margin throughout; contrary to some press forecasts late last year.
- In the medium term, the capacity auction mechanism will ensure we have enough capacity on the system to meet peak demand.
- To ensure our energy security, we are also investing in new energy infrastructure such as new nuclear and new renewables, as well as exploring for gas.

EXTRACT FROM THE AUTUMN STATEMENT



The Rt Hon George Osborne MP, Chancellor of the Exchequer 4th November 2015

"We will also exclude energy generation from the venture capital schemes, to ensure that they remain well targeted at higher risk companies....

...Investing in the long term economic infrastructure of our country is a goal of this Spending Review, and there is no more important infrastructure than energy.

So we're doubling our spending on energy research with a major commitment to small modular nuclear reactors.

We're also supporting the creation of the shale gas industry by ensuring that communities benefit from a Shale Wealth Fund, which could be worth up to £1bn.

Support for low-carbon electricity and renewables will more than double.

The development and sale of Ultra Low Emission Vehicles will continue to be supported – but in light of the slower than expected introduction of more rigorous EU emissions testing, we will delay the removal of the diesel supplement from company cars until 2021.

We support the international efforts to tackle Climate Change, and to show our commitment to the Paris talks next week, we are increasing our support for climate finance by 50% over the next five years.

DECC's day to day resource budget will fall by 22%.

We will reform the Renewable Heat Incentive to save £700 million.

We're going to permanently exempt our Energy Intensive Industries like steel and chemicals from the cost of environmental tariffs, so we keep their bills down, keep them competitive and keep them here.

I can announce we're introducing a cheaper domestic energy efficiency scheme that replaces ECO.

Britain's new energy scheme will save an average of £30 a year from the energy bills of 24 million households.

Because the Government believes that going green should not cost the earth and we're cutting other bills too. We're going to bring forward reforms to the compensation culture around minor motor accident injuries."

The Department of Energy & Climate Change carries this interpretation:

The Chancellor has published the results of the spending review, including details of the Department of Energy and Climate Change budget over the course of this parliament.

The Spending Review and Autumn Statement delivers on the government's priority to provide security to working people at every stage of their lives. It sets out a 4 year plan to fix the public finances, return the country to surplus and run a healthy economy that starts to pay down the debt. By ensuring Britain's long term economic security, the government is able to spend £4 trillion on its priorities over the next 4 years.

For the Department of Energy and Climate Change this means:

- doubling DECC's innovation programme to £500 million over 5 years, which will strengthen the future security of supply, reduce the costs of decarbonisation and boost industrial and research capabilities
- funding for an ambitious nuclear research programme that will revive the UK's nuclear expertise
- a £1.7 billion share of the government's £5.8 billion International Climate Fund, which will help the poorest and most vulnerable countries decarbonise and adapt to the effects of climate change
- resource savings of 22% by 2019-20 delivered through efficiencies in corporate services and reducing the cost of contracts

EXTRACTS FROM THE ENERGY RESET STATEMENT

The Rt Hon Amber Rudd MP, Secretary of State for Energy and Climate Change 18th November 2015

The Secretary of State for Energy and Climate Change revealed her policy priorities and her strategy for putting them into action. Amber Rudd set out her vision for an energy system that puts consumers first, delivers more competition, reduces the burden on bill-payers and ensures enough electricity generation to power the nation.

"We now have an electricity system where no form of power generation, not even gas-fired power stations, can be built without government intervention and a legacy of ageing, often unreliable plant.

"Perversely, even with the huge growth in renewables, our dependence on coal - the dirtiest fossil fuel – hasn't been reduced. Indeed a higher proportion of our electricity came from coal in 2014 than in 1999.

"So despite intervention we still haven't found the right balance."

The Energy Secretary signalled her intention to develop a cleaner, more secure energy network by consulting on closing coal fired power stations by 2025 She continued:

"I am pleased to announce that we will be launching a consultation in the spring on when to close all unabated coal-fired power stations."
"Our consultation will set out proposals to close coal by 2025 - and restrict its use from 2023. If we take this step, we will be one of the first developed countries to deliver on a commitment to take coal off the system.

"But let me be clear, we'll only proceed if we're confident that the shift to new gas can be achieved within these timescales."

She also explained that nuclear power had a central role in the UK's energy future:

"Opponents of nuclear misread the science. It is safe and reliable. The challenge, as with other low carbon technologies, is to deliver nuclear power which is low cost as well. Green energy must be cheap energy.

"We are dealing with a legacy of under-investment and with Hinkley Point C planning to start generating in the mid-2020s, this is already changing.

"It is imperative we do not make the mistakes of the past and just build one nuclear power station. There are plans for a new fleet of nuclear power stations, including at Wylfa and Moorside. It also means exploring new opportunities like Small Modular Reactors, which hold the promise of low cost, low carbon energy."

Amber Rudd went on to commit Government support for offshore wind on the condition that it comes down in cost:

"We should also support the growth of our world leading offshore wind industry.

"Today I can announce that – if, and only if, the Government's conditions on cost reduction are met – we will make funding available for three auctions in this Parliament. We intend to hold the first of these auctions by the end of 2016.

"On current plans we expect to see 10GW of offshore wind installed by 2020".

"The industry tells us they can meet that challenge, and we will hold them to it. If they don't there will be no subsidy. No more blank cheques."

The Government is also committed to taking action on climate change and to meeting the UK's 2050 target, looking ahead to the conference in Paris in December where an international deal is expected to be agreed.

The Energy and Climate Change Secretary explained:

"Action on climate change is linked to the action we're taking now to reduce the deficit. It is about resilience now and in the future. But climate change is a global problem, not a local one. Action by one state will not solve the problem. It's what we do together that counts. And that is why achieving a global deal in Paris next month is so important.

"But climate change will not be solved by a group of over-tired politicians and negotiators in a Conference centre. It will take action by businesses, civil society, cities, regions and countries.

"Paris must deliver that and help unleash the levels of private investment needed. Our most important task is providing a compelling example to the rest of the world of how to cut carbon while controlling costs."

DEPARTMENTAL STATEMENTS

Written and Oral Statements from the Department for Energy and Climate Change –17th May 2015 – 30th November 2015

Written Ministerial Statement on the November Energy Council
20th November 2015 – Andrea Leadsom MP explained her expectations of the Energy Council meeting the following week.

Written Ministerial Statement on Planning Act 2008: Yorkshire & Humberside Carbon Capture and Storage Cross Country Pipeline
19th November 2015 – Andrea Leadsom MP announced an extension to the deadline for the decision until 19 May 2016 (an extension of 6 months), to enable a decision on the Yorkshire and Humber CCS Cross Country Pipeline application for development consent to be made after the decision on the White Rose CCS Generating Station application for development consent is taken.

Written Ministerial Statement on UK Energy and Climate Change Policy
18st November 2015 – Amber Rudd explained her reset of the priorities for the UK's energy and climate change policy for the coming Parliament and published the DECC Autumn Update. New nuclear and gas generation are central to policy, supported by offshore wind. Coal generation was proposed to close coal by 2025.

Written Ministerial Statement on Energy Investments
21st October 2015 – Amber Rudd MP announced that EDF and its Chinese partner China General Nuclear Corporation (CGN) have committed to Hinkley Point C during this week's landmark China State Visit, confirming that Somerset will have the first new nuclear power station in the UK for a generation.

The companies have signed a Strategic Investment Agreement which marks a critical moment for the site in Somerset. EDF has confirmed it will take a 66.5 per cent stake in Hinkley with CGN taking 33.5 per cent, demonstrating a clear commitment from both parties.

The Government and EDF have finalised the detail of the Contract for Difference which offers increased price certainty for the electricity produced from Hinkley Point C. The Funded Decommissioning Programme will make sure that the tax payer doesn't pick up the cost of decommissioning the plant in the future.

Written Ministerial Statement on September EU Environment Council
13th October 2015 – Amber Rudd MP explained the discussion at the Council of Europe in preparation for the Paris Conference of Parties (CoP) to the United Nations Framework Convention on Climate Change (UNFCCC). These were agreed relatively swiftly following effective chairing from the Luxembourg Presidency. The Commission tabled a declaration questioning the legal accuracy of a reference in the Conclusions to the Council's intention for Member States to 'jointly fulfil' the 'at least 40%' target for emissions reductions and claiming that the Union has exclusive competence to undertake international obligations regarding climate mitigation.

Written Ministerial Statement on Shale Gas and Oil Policy
16th September 2015 – Amber Rudd MP announced the Shale Gas and Oil Policy, this formally replaces the Shale Gas and Oil Policy Statement issued by DECC and DCLG on 13 August 2015. Sections covered Safety and environmental protection, Transparency and information for the public, Planning, Sharing shale income with communities.

Written Ministerial Statement on Shale Gas and Oil Policy
22nd July 2015 – Lord Bourne of Aberystwyth announced changes to the Levy Control Framework, including changes to grandfathering under the Renewables Obligation, incentives for Solar PV, accreditation for Anaerobic Digestion Feed in Tariffs and the levy Control Framework budget post 2020.
Written Ministerial Statement on Implementing Geological Disposal Programme
20th July 2015 – Andrea Leadsom MP announced the publication of the Fifth Annual Report on implementing the geological disposal of higher activity radioactive waste.

Written Ministerial Statement on Renewable Heat Incentive
6th July 2015 – Andrea leadsom MP announced that the Department for Energy and Climate Change was laying the Renewable Heat Incentive Scheme and Domestic Renewable Heat Incentive Scheme (Amendment) (No.2) Regulations 2015 before Parliament.

Written Ministerial Statement on June EU Environment Council
30th June 2015 – Amber Rudd MP outlined the discussions at the Council of Europe in Luxembourg.

Topics included a policy debate on the National Emissions Ceilings Directive. The Presidency concluded that draft Council Conclusions in advance of the United Nations Framework Convention on Climate Change, 21st Conference of the Parties in Paris this year (UNFCCC CoP 21) would be prepared shortly for adoption at the additional Environment Council on 18 September. A successful negotiation was announced of a provisional agreement in the European Parliament on the EU Emissions Trading System (EU ETS) Market Stability Reserve Decision.

Written Ministerial Statement on Office of Nuclear Regulation
29th June 2015 – Andrea Leadsom MP announced that the Secretary of State for Energy and Climate Change would lay the Annual Report of the Office of Nuclear Regulation before Parliament.

Oral Ministerial Statement on Ending New Subsidies for Onshore Wind
22nd June 2015 – Amber Rudd MP further explained proposals to end new subsidies for onshore wind.

Written Ministerial Statement on Ending New Subsidies for Onshore Wind
18th June 2015 – Amber Rudd MP set out proposals to end new subsidies for onshore wind, specifically in relation to the Renewables Obligation (RO). It is intended that final proposals are applied across Great Britain and so consultations are underway with Scottish and Welsh Ministers on this matter, as well as Ministers in Northern Ireland.

Written Ministerial Statement on Establishing an Oil and Gas Authority
17th June 2015 – Andrea Leadsom MP informed the House that on 1 April 2015, whilst Parliament was prorogued, the Department of Energy and Climate Change established the United Kingdom's new arms'-length oil and gas regulator, the Oil and Gas Authority ("OGA"). It was reported that founding the OGA as an Executive Agency of DECC, represented a critical step in implementing the recommendations contained in Sir Ian Wood's 2014 report ("Wood Review") into maximising economic recovery from the United Kingdom's Continental Shelf ("UKCS").

Department of Business, Innovation and Skills

Written Ministerial Statement on UK Green investment Bank
15th October 2015 – Sajid Javid MP followed his statement from 25th June, saying that a key objective in moving the company into the private sector is that it should be free to borrow and raise capital without this affecting public sector net debt. Giving GIB this freedom is essential if the company is to invest in accordance with its ambitious green business plan. To enable re-classification of GIB as a private sector enterprise, it is necessary to remove the public sector controls imposed on the company by the Enterprise and Regulatory Reform Act 2013.

Written Ministerial Statement on Triennial Review of the Atomic Energy Authority
17th September 2015 – Joseph Johnson MP announced the completion of the Review. The Review concludes that the functions performed by the UK Atomic Energy Authority are still required and that it should be retained as an Executive Non Departmental Public Body. However, the review recognises that there are potential benefits for the Authority to merge with another relevant science body. It therefore recommends that the Authority should commence work to assess the viability of such a merger, with a view to implementation from 2018.

Written Ministerial Statement on UK Green Investment Bank
25th June 2015 – Sajid Javid MP declared that moving the company into private ownership is a natural development for GIB that enables it to leverage the maximum amount of private capital into green sectors for the minimum amount of public money. Our aim is that a transaction should result in GIB no longer being classified as a public sector body. This would mean GIB would be free to borrow capital so as to achieve its business ambitions without this having an effect on public sector net debt.

Department for Transport

Written Ministerial Statement on Vehicle Emissions Testing Programme
10th November 2015 – Patrick McLoughlin MP informed the House of the latest developments on vehicle emissions testing, following the revelations that Volkswagen Group had been fitting so-called defeat devices to some of its vehicles. The Government will carry out its own thorough and independent investigation to:

- establish whether the use of defeat devices goes wider than the VW Group; and
- gather much-needed evidence to restore public confidence, improve our understanding of the real world emission performance of vehicles, and strengthen our ambition and influence in pushing the EU to move to a comprehensive real world testing regime.

Officials and technical teams will work cooperatively together with those from EU Commission and Germany. This will enable reduced duplication and ensure a wide range of vehicles are tested.

PARLIAMENTARY RECORD

SELECT COMMITTEES: REPORTS AND INQUIRIES

17th May 2015 – 30th November 2015

House of Commons

Energy and Climate Change Committee

The Select Committee for Energy & Climate Change has announced six inquires.

Inquiry into ECC priorities for holding Government to account announced 16 July 2015
Energy and Climate Change Committee look at the priorities for the new Parliament
Oral evidence concluded. Report in preparation.

Inquiry into Investor confidence in the UK energy sector announced 16 September 2015
Energy and Climate Change Committee inquiry into the factors that contribute to investor confidence in the energy sector.

20th October 2015 - the Committee heard from Andrea Leadsom MP, Minister of State; Ben Golding, Deputy Director, Head of Strategy and Finance Team – Home Energy; Dr Stephanie Hurst, Head of MI Strategy and Programme Management; and Gareth Redmond, Head of Renewables Programme Team, Department of Energy and Climate Change.

1st December 2015 – The Committee heard from Alan White, Director, Carlton Power Limited; Andrew Koss, Chief Executive, Drax Power, Drax Power Group; Paul Spence, Director of Strategy and Corporate Affairs, EDF Energy; Danielle Lane, Head of Regulatory and Stakeholder Relations, DONG Energy UK.

Inquiry into Home energy efficiency and demand reduction announced 16 September 2015
Energy and Climate Change Committee inquiry into previous energy efficiency schemes.

17th November 2015 – The Committee heard from Richard Twinn, Policy Advisor, UK Green Building Council; Steve Cole, Policy Leader, National Housing Federation; Councillor Peter Fleming, Leader of Sevenoaks District Council and Member of the LGA Environment, Economy, Housing and Transport Board; Joanne Wade, Director, Association for the Conservation of Energy; and Dave Princep, Environmental Health Consultant, Residential Landlords Association; Lawrence Slade, Chief Executive Officer, Energy UK; Stephen Huller, Head of Commercial, Certinergy; Holly Jago, Corporate Affairs Manager, Calor Gas; and Isaac Occhipinti, Head of External Affairs, Energy and Utilities Alliance.

24th November 2015 – The Copmmittee heard from Mark Bayley, Chief Executive, Green Deal Finance Company.

Inquiry into Low carbon network infrastructure announced 17 September 2015
Energy and Climate Change Committee inquiry into the UK's electricity infrastructure
The deadline for written submissions was 12 November 2015. There are currently no public meetings scheduled.

Inquiry into DECC Annual Report and Accounts 2014-15 announced 05 November 2015
Energy and Climate Change Committee inquiry into Department of Energy and Climate Change's Annual Report and Accounts for 2014-15.

10th November 2015 – The one-off evidence session heard from Rt Hon Amber Rudd MP, Secretary of State, Stephen Lovegrove, Permanent Secretary and Accounting Officer, and Angie Ridgwell, Director General, Finance and Corporate Services, Department of Energy and Climate Change.

Inquiry into Security of supply announced 12 November 2015
Energy and Climate Change Committee inquiry into the security of the UK's energy supply.

24th November 2015 – The one-off evidence session heard from Cordi O'Hara, Director, UK System Operator; Duncan Burt, Head, Operate the System; and Ro Quinn, Head, Energy Strategy and Policy, National Grid.

Environmental Audit Committee

The Select Committee for Environmental Audit has announced five inquiries, three of which are noted below.

Inquiry into Future of the Green Investment Bank
28th October 2015 – The Committee heard from Shaun Kingsbury, Chief Executive Officer, and Euan McVicar, General Counsel, Green Investment Bank; Richard Howard, Head of Environment and Energy, Policy Exchange; and Ingrid Holmes, Director, E3G.

26th November 2015 – The Committee heard from Rt Hon Anna Soubry MP, Minister for Small Business, Industry and Enterprise, Department for Business, Innovation and Skills; Richard Callard, Executive Director, Green Investment Bank Shareholder Team, Business Innovation and Skills.

Inquiry into Assessment of EU/ UK environmental policy
2nd December 2015 – The Committee heard from Professor Maria Lee, Professor of EU Environmental Law, University College London (UCL); Dr Sebastian Oberthuer, Professor of Environment and Sustainable Development, Institute for European Studies (IES); Nigel Haigh, Honorary Fellow, Institute of European Environmental Policy (IEEP).

Inquiry into The Government's approach to sustainable development
10th November 2015 – The Environmental Audiot Committee hosted a conference with Panel Members: Mike Barry, Director of Sustainable Business, Marks & Spencer; Sir Amyas Morse, Comptroller and Auditor General, National Audit Office; Lord Krebs, Chair, Adaptation Sub-Committee, Committee on Climate Change; Stephanie Hilborne OBE, Chief Executive, The Wildlife Trusts; and Matthew Spencer, Director, Green Alliance.

Communities & Local Government Committee

The Select Committee for Communities and Local Government has six inquiries, three of which are noted below.

Inquiry into Housing and Planning Bill
9th November 2015 – The Committee held a one-off session to hear from Brandon Lewis MP, Minister of State for Housing and Planning, Department for Communities and Local Government.

Inquiry into DCLG priorities in the 2015 Parliament
15th September 2015 – The Committee held a one-off session to from the Rt Hon Greg Clark MP, Secretary of State; Brandon Lewis MP, Minister of State for Housing and Planning; and Rt Hon Mark Francois MP, Minister of State for Communities and Resilience, Department for Communities and Local Government.

Inquiry into The Government's Cities and Local Government Devolution Bill
10th November 2015 – The Committee heard from Ian Williamson, Chief Officer, Greater Manchester Health and Social Care Devolution; Rob Webster, Chief Executive, NHS Confederation; and Councillor Linda Thomas, Vice Chair, Local Government Association Wellbeing Portfolio; Councillor Paul Carter, Chair, County Councils Network; Councillor John Pollard, Leader, Cornwall Council; and Councillor Alan Rhodes, Leader, Nottinghamshire County Council.

23rd November 2015 – The Committee heard from Lord Kerslake, Chair, Centre for Public Scrutiny; Ed Cox, Director, Institute for Public Policy Research (North); Councillor Sue Jeffrey, Chair, Shadow Tees Valley Combined Authority; Sir Edward Lister, Deputy Mayor of London, Policy and Planning; Darren Johnson, Chair, Devolution Working Group, London Assembly; John O'Brien, Chief Executive, London Councils.

House of Lords

EU Energy and Environment Sub-Committee

Inquiry into EU energy governance

28th October 2015 – The Committee heard evidence given by Andrea Leadsom MP, Minister of State, DECC; Tim Abraham, Head of European Policy, DECC.

PARLIAMENTARY ORAL QUESTIONS AND DEBATES

17th May 2015 – 30th November 2015

House of Commons

Sustainable Development Goals
Kate Green (Stretford and Urmston) (Lab):
3 Jun 2015 : Column 576

Swansea Bay Tidal Lagoon
Richard Graham (Gloucester) (Con)
3rd June 2015 : Column 588

Onshore Wind Subsidies
Glyn Davies (Montgomeryshire) (Con)
3rd June : Column 589

Household Energy Efficiency programmes
Dr Alan Whitehead (Southampton, Test) (Lab)
10th June 2015 : Column 1184

Elimination of Fossil Fuel
Diana Johnson (Kingston upon Hull North) (Lab)
10th June 2015 : Column 1209

Climate Change Conference of Parties
Caroline Flint (Don Valley) (Lab):
10 Jun 2015 : Column 1265

Navitus Bay Wind Farm
Richard Drax (South Dorset) (Con)
15 Jun 2015 : Column 154

Fracking Waste Water
Geraint Davies (Swansea West) (Lab/Co-op)
17th June 2015 : Column 314

Election of Select Committe Chairmen
Mr Speaker
18th June 2015 : Column 470

Energy Questions

Climate Change Adaptation Plan
Rachael Maskell (York Central) (Lab/Co-op):
Onshore Wind Subsidies
The Secretary of State for Energy and Climate Change (Amber Rudd MP)
Community Energy Schemes
Dr Sarah Wollaston (Totnes) (Con)
Fossil Fuel Subsidies
Caroline Lucas (Brighton, Pavilion) (Green)
Subsidies for Fracking
Ian C. Lucas (Wrexham) (Lab)
Stable Regulatory Regime
Barry Gardiner (Brent North) (Lab)
Investor Confidence
Mr David Hanson (Delyn) (Lab)
Andrew Gwynne (Denton and Reddish) (Lab)
Subsidies in Northern Ireland
Mark Durkan (Foyle) (SDLP)
Tidal Energy
Richard Graham (Gloucester) (Con)
Peter Grant (Glenrothes) (SNP)
22nd June 2015 : Column 617-632

Energy Questions

Environmental Agenda
Fiona Bruce (Congleton) (Con)
Ben Howlett (Bath) (Con)
Carbon Capture & Storage
Dennis Skinner (Bolsover) (Lab)
Co-operation with DEFRA
Barry Sheerman (Huddersfield) (Lab/Co-op)
Increasing Renewables
Liz McInnes (Heywood and Middleton) (Lab)
Swansea Bay Tidal Zone
Mr David Jones (Clwyd West) (Con)
Stephen Kinnock (Aberavon) (Lab)
Column 1024)
Carolyn Harris (Swansea East) (Lab) (Column 1036)
Energy Competitiveness
Douglas Carswell (Clacton) (UKIP)
Early end of Renewables
Obligation
Callum McCaig (Aberdeen South) (SNP)
Renewables Incentives
Julie Elliott (Sunderland Central) (Lab)
Preparations for Paris CoP
Craig Williams (Cardiff North) (Con)
Huw Merriman (Bexhill and Battle) (Con)
Albert Owen (Ynys Môn) (Lab)
Fracking
John McNally (Falkirk) (SNP)
Carbon Reduction Commitments
David Mowat (Warrington South) (Con)
EU GHG
Jonathan Reynolds (Stalybridge and Hyde) (Lab/Co-op)
Future of Nuclear
Bob Blackman (Harrow East) (Con)
Nuclear Sunsidies
Graham Jones (Hyndburn) (Lab)
Wind Farm Applications
Phil Wilson (Sedgefield) (Lab)
Home Energy Efficiency
Tom Tugendhat (Tonbridge and Malling) (Con)
Renewable Energy Certificates
Dr Alan Whitehead (Southampton, Test) (Lab)
Renewable Energy
Mr Nigel Evans (Ribble Valley) (Con)
Mike Weir (Angus) (SNP)

Household Energy Efficiency
Debbie Abrahams (Oldham East and Saddleworth) (Lab)
Sue Hayman (Workington) (Lab)
Joan Ryan (Enfield North) (Lab)
Chris Skidmore (Kingswood) (Con) (Column 1031)

VAT on Energy Efficiency Materials
Tim Loughton (East Worthing and Shoreham) (Con)

Fuel Poverty
Jonathan Reynolds (Stalybridge and Hyde) (Lab/Co-op)

Oil and Gas industry
Stuart Blair Donaldson (West Aberdeenshire and Kincardine) (SNP)
Peter Aldous (Waveney) (Con)

Renewable Energy Jobs
Peter Grant (Glenrothes) (SNP)
Stuart C. McDonald (Cumbernauld, Kilsyth and Kirkintilloch East) (SNP)

Cost of Subsidies
Mr Peter Lilley (Hitchin and Harpenden) (Con)

Offshore Wind project
Tasmina Ahmed-Sheikh (Ochil and South Perthshire) (SNP)

Carbon Abatement
Huw Irranca-Davies (Ogmore) (Lab)

Preservation of Trees
Rebecca Pow (Taunton Deane) (Con)

Decarbonised Electricity
Steve McCabe (Birmingham, Selly Oak) (Lab)

FIT, CfD and the Islands
Angus Brendan MacNeil (Na h-Eileanan an Iar) (SNP)

CMA Report on Energy
Kerry McCarthy (Bristol East) (Lab)

Hinkley Point C
Rebecca Pow (Taunton Deane) (Con)

Green Investment Bank
Julie Elliott (Sunderland Central) (Lab)

Cross-Department Government Action
Karin Smyth (Bristol South) (Lab)

Fusion Technology
Laurence Robertson (Tewkesbury) (Con)

Community Energy in Nottingham
Lilian Greenwood (Nottingham South) (Lab)

Smart Meter Roll-out
Dr Tania Mathias (Twickenham) (Con)

Hatfield Colliery
Edward Miliband (Doncaster North) (Lab)

Bath Hot Water Scheme
Ben Howlett (Bath) (Con)

Solar Generation on Schools
Helen Hayes (Dulwich and West Norwood) (Lab)

British Deep Mining
Ian Lavery (Wansbeck) (Lab)

Offshore wind
Peter Aldous (Waveney) (Con)

Solar Farming Diversification
Jim Shannon (Strangford) (DUP)

Culzean project
Mary Glindon (North Tyneside) (Lab)

Changes to ECO
Graham Jones (Hyndburn) (Lab)
25 Jun 2015 : Column 1015-1037

Onshore Wind Farms
Robert Flello (Stoke-on-Trent South) (Lab)
Callum McCaig (Aberdeen South) (SNP)
Alistair Carmichael (Orkney and Shetland) (LD)
15 July 2015 : Column 876

Energy Questions

Renewables Obligation
Dr Alan Whitehead (Southampton, Test) (Lab)
17th September 2015 : Column 1168

Low-Carbon Energy Generation
Margaret Greenwood (Wirral West) (Lab)
Christina Rees (Neath) (Lab)
Peter Aldous (Waveney) (Con)
Neil Carmichael (Stroud) (Con)
Caroline Lucas (Brighton, Pavilion) (Green)
Martin Vickers (Cleethorpes) (Con)
Callum McCaig (Aberdeen South) (SNP)
Julie Elliott (Sunderland Central) (Lab)
17th September 2015 : Column 1170-2

Carbon Dioxide Emissions
Helen Goodman (Bishop Auckland) (Lab)
Mr Peter Lilley (Hitchin and Harpenden) (Con)
Mr Barry Sheerman (Huddersfield) (Lab/Co-op)
Mr Philip Hollobone (Kettering) (Con)
17th September 2015 1174

Climate Change Conference
David Mowat (Warrington South) (Con)
Barry Gardiner (Brent North) (Lab)
Philip Davies (Shipley) (Con)
Lisa Nandy (Wigan) (Lab)
17th September 2015 : Column 1175

National Grid
Patrick Grady (Glasgow North) (SNP)
Sir Roger Gale (North Thanet) (Con)
17th September 2015 : Column 1177

Feed-In Tariff
Jeff Smith (Manchester, Withington) (Lab)
Julian Sturdy (York Outer) (Con)
Liz Saville Roberts (Dwyfor Meirionnydd) (PC)
17th September 2015 : Column 1178

Drew Hendry (Inverness, Nairn, Badenoch and Strathspey) (SNP)
Steve Double (St Austell and Newquay) (Con)
Alison McGovern (Wirral South) (Lab)
17th September 2015 : Column 1180-81

Oil & Gas Authority
Stuart Blair Donaldson (West Aberdeenshire and Kincardine) (SNP)
Kirsty Blackman (Aberdeen North) (SNP)
Callum McCaig (Aberdeen South) (SNP)
17th September 2015 : Column 1179

Energy Supply Market
Christopher Pincher (Tamworth) (Con)
Pauline Latham (Mid Derbyshire) (Con)
Andrew Bingham (High Peak) (Con)
Maria Caulfield (Lewes) (Con)
Caroline Flint (Don Valley) (Lab)
17th September 2015 : Column 1182

Scottish Renewables Delivery Forum
Carol Monaghan (Glasgow North West) (SNP)
17th September 2015 : Column 1183

Solar Consultations
Ian C. Lucas (Wrexham) (Lab)
Low Carbon Research
Nicola Blackwood (Oxford West and Abingdon) (Con)
Stability of Energy Policy
Jonathan Reynolds (Stalybridge and Hyde) (Lab/Co-op)
Consumer gas prices
Stephen Hammond (Wimbledon) (Con)
17th September 2015 : Column 1184

Energy Taxes
Stuart Blair Donaldson (West Aberdeenshire and Kincardine) (SNP)
Meeting Carbon and Renewables Targets
Alex Chalk (Cheltenham) (Con)
Scottish Ministerial Representation at CoP
Patrick Grady (Glasgow North) (SNP)
Planning Solar Farms
Antoinette Sandbach (Eddisbury) (Con)
Energy Supplier Switching
Paula Sherriff (Dewsbury) (Lab)
17th September 2015 : Column 1185

Subsidy for Anaerobic Digestion
Jo Churchill (Bury St Edmunds) (Con)
Nuclear Decommissioning Authority
Clive Lewis (Norwich South) (Lab)

Chinese Steel Imports
Tom Pursglove (Corby) (Con)
Planning for Fracking
Richard Burgon (Leeds East) (Lab)
17th September 2015 : Column 1186

Spare Capacity in Winter
Mr David Nuttall (Bury North) (Con)
Abolition of DECC
Mr Peter Bone (Wellingborough) (Con)
10 Year Plan for Renewables
Melanie Onn (Great Grimsby) (Lab)
17th September 2015 : Column 1187

Promotion of Gas
Peter Aldous (Waveney) (Con)

Feed-In Tariff Cuts
Helen Hayes (Dulwich and West Norwood) (Lab)

Nuclear
David Mowat (Warrington South) (Con)
17th September 2015 : Column 1188

Energy Conservation Measures
Hywel Williams (Arfon) (PC)
21st October 2015 : Column 958

International view of UK policy
Mr Angus Brendan MacNeil (Na h-Eileanan an Iar) (SNP)
28th October 2015 : Column 328

Support for Energy Intensive Industry
Ian C. Lucas (Wrexham) (Lab)
28th October 2015 : Column 343

Opposition Day Debate: Steel Industry
28th October 2015 Column 363-9

Onshore Wind Power Planning
Glyn Davies (Montgomeryshire) (Con)
4th November 2015 : Column 947

Environment Questions

Air Quality
Mr Ben Bradshaw (Exeter) (Lab)
5th November 2015 : Column 1099

Minimum Energy Standards for Rented Property
Gavin Newlands (Paisley and Renfrewshire North) (SNP)
5th November 2015 : Column 1105

Fracking in National Parks
Jonathan Reynolds (Stalybridge and Hyde) (Lab/Co-op)
5th November 2015 : Column 1105

Private Rented Sector
Dr Alan Whitehead (Southampton, Test) (Lab)
8th November 2015 : Column 14

Code for Sustainable Homes
Dr Alan Whitehead (Southampton, Test) (Lab)
9th November 2015 : Column 22

Energy-Intensive User Compensation
Alex Cunningham (Stockton North) (Lab)

Supplier Switching
Nigel Huddleston (Mid Worcestershire) (Con)
10th November 2015 : Column 219

Teeside Collective for Industrial Carbon Capture
Andy McDonald (Middlesbrough) (Lab)
18th November 2015 : Column 671

Energy Questions

Renewables Targets 2020
Rachael Maskell (York Central) (Lab/Co-op)
Paula Sherriff (Dewsbury) (Lab)
David T. C. Davies (Monmouth) (Con)
Coal Phase out
David Mowat (Warrington South) (Con)

Offshore wind
Paula Sherriff (Dewsbury) (Lab)
Angus Brendan MacNeil (Na h-Eileanan an Iar) (SNP)
Burton Wold Wind Farm
Mr Philip Hollobone (Kettering) (Con)
Paris CoP Targets
Christian Matheson (City of Chester) (Lab)
Imran Hussain (Bradford East) (Lab) (Col 812)
Decarbonising Heat
Callum McCaig (Aberdeen South) (SNP)
Fossil fuel subsidy
Liz Saville Roberts (Dwyfor Meirionnydd) (PC)
Energy Jobs
Lisa Nandy (Wigan) (Lab)
Ben Bradshaw (Exeter) (Lab)
Wholesale Gas Prices to Household Bills
Suella Fernandes (Fareham) (Con)
Nusrat Ghani (Wealden) (Con)
Demand Reduction
Jonathan Reynolds (Stalybridge and Hyde) (Lab/Co-op)
Energy Efficiency of Park Homes
Jim Shannon (Strangford) (DUP)
Renewable Energy Subsidies
Mike Freer (Finchley and Golders Green) (Con)
Mims Davies (Eastleigh) (Con)
Stephen Hammond (Wimbledon) (Con)
Onshore Wind Subsidy
Margaret Ritchie (South Down) (SDLP)
Callum McCaig (Aberdeen South) (SNP)
Humber Energy Cluster
Martin Vickers (Cleethorpes) (Con)
Gas Subsidy
Dr Alan Whitehead (Southampton, Test) (Lab)

Energy Efficiency for the Fuel poor
Tulip Siddiq (Hampstead and Kilburn) (Lab)
Judith Cummins (Bradford South) (Lab)
Improvement of Home Energy Efficiency
Clive Lewis (Norwich South) (Lab)
Paris Climate Change Conference
Nick Thomas-Symonds (Torfaen) (Lab)
Barry Gardiner (Brent North) (Lab)
Lisa Nandy (Wigan) (Lab) (Col 816)
Government's Environmental Agenda
Jake Berry (Rossendale and Darwen) (Con)
Daniel Zeichner (Cambridge) (Lab)
Merseyside Tidal Barrage
John Pugh (Southport) (LD)
New Nuclear
Stephen Metcalfe (South Basildon and East Thurrock) (Con)
Caroline Lucas (Brighton, Pavilion) (Green)
Helen Goodman (Bishop Auckland) (Lab)
Solar Energy: Schools
Graham Allen (Nottingham North) (Lab)
District Heating Sector
Matthew Pennycook (Greenwich and Woolwich)
Solar Power: Feed in Tariffs
Alex Cunningham (Stockton North) (Lab)
Michelle Donelan (Chippenham) (Con)
Ruth Cadbury (Brentford and Isleworth) (Lab)
Clive Efford (Eltham) (Lab)
Supplier Switching
Nigel Huddleston (Mid Worcestershire) (Con)
Energy Security
David Rutley (Macclesfield) (Con)
In-Home Displays
Matthew Pennycook (Greenwich and Woolwich) (Lab)
Small Modular Nuclear Reactors
David Mowat (Warrington South) (Con)
Community Energy Schemes
Anna Turley (Redcar) (Lab/Co-op)
Power to Switch/Winter Fuel
Jake Berry (Rossendale and Darwen) (Con)

Green Investment Bank
Stuart Blair Donaldson (West Aberdeenshire and Kincardine) (SNP)
5% VAT on Fuel
Christopher Chope (Christchurch) (Con)
Peterhead CCS Project
Roger Mullin (Kirkcaldy and Cowdenbeath) (SNP)

Shale Gas in North Yorkshire
Kevin Hollinrake (Thirsk and Malton) (Con)
National Grid Balancing Charges
Alan Brown (Kilmarnock and Loudoun) (SNP)
Stranded Gas Assets
Huw Irranca-Davies (Ogmore) (Lab)
Coal Import Job Losses
Martin Vickers (Cleethorpes) (Con)
Carbon Capture & Storage
Ian Lavery (Wansbeck) (Lab)
Energy Efficiency as Infrastructure Investment
Caroline Lucas (Brighton, Pavilion) (Green)
Last Deep Pit Mine Closure
Dennis Skinner (Bolsover) (Lab)
Regulation of Heat to Cut Incentive
Jonathan Reynolds (Stalybridge and Hyde) (Lab/Co-op)
Renewables Subsidies
Clive Efford (Eltham) (Lab)
19th November 2015 : Column 802-822

Teeside CCS
Tom Blenkinsop (Middlesbrough South and East Cleveland) (Lab)
19th November 2015 : Column 836

Renewables Obligation Northern Ireland
Margaret Ritchie (South Down) (SDLP)
25th November 2015 : Column 1341

Solar Energy Incentives
Jeremy Corbyn (Islington North) (Lab)
25th November 2015 : Column 1349

House of Lords

Measures to increase energy security
Lord Howell of Guildford
28th May 2015 : Column 45

Energy Bill
Baroness Williams of Trafford
2nd June 2015 : Column 302

Offshore Renewable Energy
Baroness Liddell of Coatdyke
4th June 2015 : Column 550

G7
Lord Wallace of Tankerness (LD)
10 Jun 2015 : Column 816

Electricity Supply: Decarbonisation
Lord Whitty
15 Jun 2015 : Column 993

Climate Change
Baroness Worthington
17 Jun 2015 : Column 1153

Energy: Onshore Wind
Baroness Worthington
23 Jun 2015 : Column 1474

Renewable Energy
Viscount Ridley

Fracking
Lord Truscott
7 July 2015 : Column 101

Sellafield
Viscount Hanworth
8 July 2015 : Column 177

Carbon Emissions
Lord Purvis of Tweed
16 July 2015 : Column 690

Renewable Energy: Solar
Lord Young of Norwood Green
14 Oct 2015 : Column 232

Draft Wales Bill
Baroness Gale
29 Oct 2015 : Column 1280

Global Climate Change
Lord Hunt of Chesterton
29 Oct 2015 : Column 1283

Hinkley Point: Chinese Investment
Baroness Jones of Moulsecoomb
2 Nov 2015 : Column 1397

Energy Bill
Baroness Worthington (Lab):
4 Nov 2015 : Column 1643

Green Investment Bank
Lord Barker of Battle (Con):
30 Nov 2015 : Column 946

SELECT COMMITTEE ON ENERGY AND CLIMATE CHANGE

Since the General Election, the Select Committee has been reformed. All of the members were new except for two, Dr Alan Whitehead and Ian Lavery. However, following the Labour leadership election, both have been selected for the Shadow Cabinet, to be replaced by Rushanara Ali and Tom Blenkinsop.

Angus MacNeil (Chair)	**Scottish National Party**
Mr Alistair Carmichael	**Liberal Democrat**
Glyn Davies	**Conservative**
James Heappey	**Conservative**
Rushanara Ali	**Labour**
Melanie Onn	**Labour**
Matthew Pennycook	**Labour**
Dr Daniel Poulter	**Conservative**
Antoinette Sandbach	**Conservative**
Julian Sturdy	**Conservative**
Tom Blenkinsop	**Labour**
Dr Alan Whitehead	**Labour**

(Currently, Dr Alan Whitehead still appears listed as a member of the Select Committee.)

LEGISLATION

17th May 2015 – 30th November 2015

Government Bills

Energy Bill 2105-16
(Lord Bourne of Aberystwyth) (Con)

1st Reading 9th July 2015 House of Lords

2nd Reading 22nd July House of Lords

1st Sitting 14-19th October 2015

Report 1st Sitting 19th October

Report 2nd Sitting 21st October

3rd Reading 4th November 2015 House of Lords

1st Reading 5th November House of Commons

Private Members' Bills

Department of Energy and Climate Change (Abolition)
Peter Bone MP (Con, Wellingborough)

Commons

1st Reading 29th June 2015

2nd Reading to be 22nd January 2016

Off-Shore Wind Farm Subsidies (Restriction) Bill 2015-16
Christopher Chope MP (Con, Christchurch)

Commons

1st Reading 6th July 2015

2nd Reading to be 26th February 2016

Public Nuisance from Wind Farms (Mandatory Liability Cover) Bill 2015-16
David Davis MP (Con, Haltemprice and Howden)

Commons

1st Reading 21st July 2015

2nd Reading to be 26th February 2016

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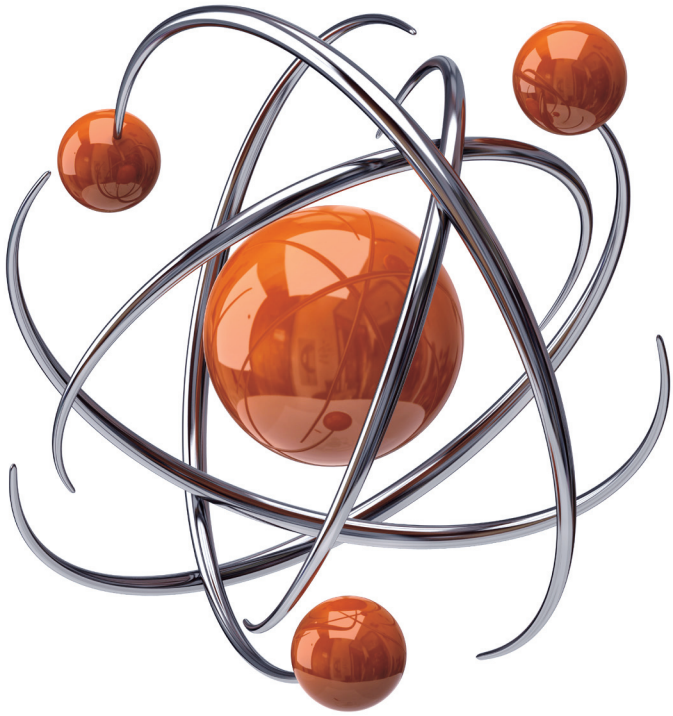

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