Much of the work of the previous Government was spent introducing an Energy Act that significantly changed Great Britain’s electricity market. There is now a danger that ‘reform fatigue’ will deter the new Government from contemplating the need for further reform. However, it would be a mistake for the UK’s new Secretary of State for Energy and Climate Change, Amber Rudd MP, to think that all the issues are settled.

Few observers would argue that the current system is adequate to address future energy policy challenges. The market arrangements place a high cost burden on consumers and may fail to deliver a resilient power system. It will be difficult to correct these failings through small adjustments to market rules.

Instead, it will be necessary for the new Secretary of State to bite the bullet and identify the priority actions that will help put policy delivery back on course. This paper recommends three key issues to tackle:

> Developing demand side markets – through introducing market reforms that clearly expose the value of demand response.

> Accelerating regional integration within the EU energy market – through institutional change at policy, regulatory and operational levels.

> Reviewing policy delivery mechanisms – through replacing existing market-wide schemes such as the capacity mechanism and carbon price support with targeted mechanisms such as emissions performance standards and contracts to procure flexible system capacity and renewable energy.
Context

In the run-up to the previous general election in 2010, all major political parties had converged on the need for a major program of electricity market reform (EMR). It was included as one of the least controversial aspects in the coalition agreement and the Secretaries of State for Energy and Climate Change (Chris Huhne and Ed Davey) were able to promise a ‘once in a generation’ opportunity to reform the electricity market. After several years of intense policy activity and a new Energy Act appearing on the statute book, it is perhaps surprising that the question of EMR is featuring again on the agenda of the incoming government.

Whereas the discussion prior to the previous election focused on the need for a more managed transformation to a low-carbon power system, recent political attention has been directed at the workings of retail energy markets and the need to improve consumer protection through greater regulatory oversight and control energy costs. A Competition and Markets Authority (CMA) investigation was triggered and is due to report in the summer.

The UK is not alone in questioning the success of existing market arrangements. Despite two decades of development, there is increasing concern across Europe that the Internal Energy Market (of which the UK system is part) is not fit-for-purpose as currently constituted. It has failed to deliver significant sharing of resources between Member States and there is little evidence that the market will stimulate investment in the range of flexible resources (both electricity generation and demand-side solutions) that will be needed to effectively integrate intermittent renewables onto the system. Moreover, the transition to a renewables-heavy and de-centralised energy system is well underway in parts of Europe. Some utilities have been slow to respond to these changes and the impact on their business models has been devastating. This has led to debates as whether it is appropriate for public funding to be spent on shoring up these creaking utilities or whether it is better to help build a system that involves new entrants with different business models selling a range of energy products and services.

The German Government is currently consulting on a number of options for market reform and has proposed that the time is right to move to a new market model (described as electricity market 2.0), thereby rejecting the idea of capacity payments that might help the existing utilities. In parallel, the European Commission has committed to propose a new European electricity market design in 2015, followed by legislation in 2016, as part of its centre-piece Energy Union package of measures. The Commission believes that an effective internal energy market is the key to achieving competitiveness of the European economy and is potentially Europe’s answer to the shale gas boom in the US.

This raises a number of key questions for the incoming Government in the UK. There is, understandably, some reluctance to embark on a new major initiative of market reform that re-opens the issues tackled by the previous legislative program. However, there are several reasons why the unfolding agenda might make this difficult. Firstly, it is not obvious that it is possible to address broader consumer concerns without re-opening some of the core market mechanisms. Also, it may not be appropriate, or even possible, to ignore developments in Europe if the UK is to reap the benefits afforded by EU market integration.
This note seeks to address these issues. An on-going agenda of market reform cannot be avoided – it is a fact of life in modern energy markets. What is important is that the reforms recognise that the market is changing and a reform program must be clearly targeted on addressing the challenges of tomorrow rather than revisiting those of the past.

The Legacy of EMR

The initial logic for EMR was clear. Much of the existing UK generation fleet was due to close and this needed to be replaced – mostly with low-carbon generation capacity and other flexible resources such as modern designs of combined cycle gas turbine (CCGT) plant. The EMR proposals involved a ‘belt and braces’ package of measures that sought to:

1. Ensure replacement assets were low-carbon and to discourage life-extension of existing high carbon assets using a carbon price support (CPS) and emissions performance standards (EPS), and
2. Reduce the costs of capital, and manage the timing, of investments in new capacity through a contract-for-difference (CfD) system and a capacity payment mechanism (CM).

Unfortunately, it appears unlikely that the EMR package will effectively deliver these initial requirements. The EPS as a concept was largely neutered and has little material impact whilst the CPS has been the subject of constant controversy and the envisaged price escalation has already been paused. The CM design rewards existing capacity and, without clear closure deadlines for the UK’s ageing coal plants, will hinder rather than promote a transformation to a low-carbon energy system.

Perhaps the most concerning aspect however relates to the FIT system. Significant sums have already been committed to a number of large projects (in particular, the new nuclear power plant at Hinkley) and it is not clear how payments to projects needed in the future will be consistent with medium term spending constraints through the Levy Control Framework. This is creating concern on the part of investors. The Government has created a system in which these investments rely on support and yet there is no confidence that this support will be sustained in sufficient quantities. This perception creates a political risk that undermines any cost-of-capital advantages that may have been expected as a result of introducing CfDs.

Although the prospect of a further round of market reform is treated with weary resignation by many in industry and Government, this is not down to complete satisfaction with the way the current system is working. The energy policy agenda being pursued by Government is poorly understood and commands little widespread support from the general public or the business and investor community. In addition, many energy consumers do not trust large energy suppliers and expect Government to intervene in the market on their behalf. However, they are often also suspicious of the role Government is playing and the extent to which the existing package of policy interventions are necessary and whether they are a key factor in the escalation of energy prices.
Dissatisfaction with energy costs cannot be treated simply through implementing the conclusions of the CMA investigation by adjusting the nature of retail market competition. Any positive changes that can be delivered through these reforms will be swamped by fluctuations in gas prices and the costs of policy interventions. A serious attempt to reduce costs for consumers therefore requires a more fundamental review of the underlying market mechanisms. The extent to which the incoming Government is prepared to rise to this challenge is the key question that faces the new Secretary of State for Energy and Climate Change.

The Policy Challenge

Despite the apparent political differences surrounding energy policy, there remains broad consensus over the high level objectives. Energy supplies must be secure and affordable and the energy system must be progressively decarbonised. Put another way, we must find a pathway to long term prosperity and security that supports economic growth and prosperity in the short term. Trading-off one of these objectives for another would represent policy failure and it is vital that trade-offs are avoided. However, there is little confidence that the current set of energy policies will succeed and there is a widely held view that we are heading towards policy failure of one form or another.

There is a need for a new energy policy narrative that explains how the tensions will be resolved in a way that is credible and easy to understand. This narrative must address the following issues:

> How does it make the lives of current consumers better not worse?
> How can we decarbonise at an acceptable short term cost?
> How do we ensure the energy system is robust to credible ‘events’?
> How does policy encourage innovation in the energy industry?
> What is the dividend for industrial policy and growth?

There are many issues that contribute to future uncertainty and could affect the ability to deliver policy objectives. It is, therefore, important that policy measures are designed to create a number of credible ways to deliver the objectives so that success does not rely on a limited number of events occurring as anticipated. The Government has a strategic role to play in creating the options for a range of future technology pathways by ensuring a flexible and dynamic infrastructure and a diverse resource base.

Government interventions are, therefore, a reality of the energy market, both now and in the foreseeable future. Current examples include targets to support the deployment of low-carbon generation, targets for generation adequacy and obligations to deploy energy efficiency measures. However, there is little evidence that the existing set of targets have been implemented as part of an holistic and strategic attempt to manage the risks of delivering energy policy objectives. Instead, they have emerged in an ad hoc and piecemeal fashion. This may be due to the persistent but misleading narrative that ‘we have a free energy market’
with each intervention being treated independently as a ‘one-off’ or temporary measure. This results in a reticence to think strategically about ‘managing’ or ‘planning’ the market.

The consequence is, however, that we have an incoherent system with measures being determined by a variety of parties on a largely unrelated basis. This approach is not delivering best value outcomes on behalf of customers: more bluntly, it is wasting customers’ money and failing to deliver a robust energy policy. This incoherence exists across the value chain, between energy sectors and with other EU Member States. Policy structures do not exist to optimise the interventions that are being taken and need to be taken in the future. There is, therefore, huge potential to develop a more robust policy at much cheaper cost than is currently being delivered.

A positive electricity market reform agenda

The focus on implementing the previous package of EMR has meant that there has been little debate over the future requirements for change. Professor Helm has recently proposed a package of market reforms[^1] but these are largely focused on ‘fighting the last war’ by correcting the ‘wrongs’ of the past rather than addressing the challenges of the future (see Appendix for a more detailed consideration of Professor Helm’s proposals).

Instead, policy makers need to redouble efforts to reduce costs to consumers. The incoherence in current policy provides many potential avenues to explore and it is necessary to prioritise efforts on the most promising areas. Three opportunities stand out as particularly important:

- Developing demand side markets
- EU market integration
- Review policy delivery mechanisms

Developing demand side markets

Despite nearly two decades of full retail market competition, the vast majority of energy customers remain passive, distrustful and disengaged. Policy makers are trapped by the mantras of encouraging supplier switching and designing wholesale markets to suit large dispatchable power stations. This situation needs to change. Not only are there real opportunities to improve the lives of consumers through deploying the smart technologies that will help deliver comfort and convenience, but the potential savings for customers as a whole could be significant. The EU Commission has recently calculated that a fully active demand side of the market could save €60-100bn each year across Europe[^2], a number that dwarves any credible savings from supplier switching or clever choices in generation technologies. Moreover, Europe (and the UK in particular) has a real industrial opportunity in developing the businesses needed to deliver new consumer energy services and could easily be left behind by the US and China if the agenda is not progressed quickly.

[^1]: http://www.dieterhelm.co.uk/sites/default/files/Competition%20in%20the%20British%20Electricity%20Sector.pdf
The European Commission recently set out a vision in its ‘Energy Union’ Communication to create ‘an Energy Union with citizens at its core, where citizens take ownership of the energy transition, benefit from new technologies to reduce their bills, participate actively in the market, and where vulnerable consumers are protected’.\footnote{Energy Union Communication: \url{http://ec.europa.eu/priorities/energy-union/docs/energyunion_en.pdf}} Delivering these benefits will not be easy and there is a real risk that relying on small incremental reforms will fail to lead to any change in outcome. Instead, there is the need to refocus on the consumer and consider what is needed for individual and corporate customers to want to embrace the new opportunities.

In particular, it is necessary to consider whether consumers are likely to behave as rational economic agents or whether their actions will be dominated by the ‘irrationalities’ that underpin more recent thinking in behavioural economics. In reality, there will be a spectrum of behaviour across customer classes with large commercial organisations able to take more rational economic decisions whilst smaller businesses and individual citizens may deviate from this quite significantly.

An incremental reform process would simply aim to remove barriers and establish the ‘correct’ economic signals; but this will inevitably restrict participation - essentially to the large or very well-informed consumers. This may be enough to introduce significant efficiencies into market operation and is more aligned with traditional approaches to market design and regulation. However, it is difficult to see how this approach is consistent with the vision set out in the Energy Union Communication which speaks to the engagement (or protection) of all consumers, as a means of achieving the largest social and economic benefits. Achieving this vision requires some deeper thinking about what is required in order to achieve widespread consumer participation and the implications for market design and regulatory incentives.

Understanding consumer behaviour is not the only challenge in building demand side markets. The proliferation of technological solutions coupled with an uncertain market opportunity makes it extremely difficult for smaller businesses to secure finance and drive down costs through mass production. This leaves us dependent on larger companies with better access to capital and greater customer insight. However, these companies, particularly the large traditional utilities, may have little incentive to drive growth in new customer-facing energy products. It is not surprising that the various industry expert groups currently working on demand side markets and smart grids have focused on improving economic signals to customers and implementing processes designed around existing industry structures.

Notwithstanding these challenges, the creation of a compelling economic case for consumers remains a fundamental requirement. This will involve two aspects: minimising discretionary costs and maximising value. The first of these will require some degree of regulatory mandate and/or standards to create the market opportunity that will allow technology manufacturers to reduce costs and reduce any upfront expenditure on the part of the consumer. The value side of the equation is complicated by the multiplicity of potential uses of demand response services. In particular, demand response can help with system balancing (or avoiding investment) at both local and national or regional levels. The electricity market design must ensure that the greatest value is apparent and available to consumers, regardless of whether this is providing local grid services or helping a supplier to reduce imbalance charges. Moreover, this complexity must be opaque to the consumer who must have a clear single
interface providing simple tariff choices. It is possible to deliver this ‘co-optimisation’ of value between grid and energy services through rules to reveal prices for different services that can be assessed concurrently. Alternatively, structural solutions are available whereby a single institution is responsible for minimising both energy procurement and system costs. Although the structural solution might appear attractive from an implementation perspective, it effectively would involve rolling back the unbundling agenda and competitive markets in retail supply.

The key issues facing policy makers wishing to promote demand-side markets are, therefore, finding a solution to the ‘co-optimisation’ challenge and the introduction of new incentives to encourage consumer participation. This will certainly require a more ‘top-down’ approach by Government and cannot be left to the current ‘expert’ forums to deliver. Ultimately, however, it might also require a more fundamental review of the structure and regulation of competitive retail markets and local network operation.

**European market integration – grasping the regional opportunities**

A separate but equally significant source of potential savings is available through achieving genuine integration of energy markets across Europe. The EU Commission estimates that energy system costs could be reduced by €40-70bn annually⁴, but realising this benefit will require the UK Government to step beyond the common but misguided concerns that it is inappropriate to rely on other countries to help provide security for the UK power system. As more physical interconnectors are built, the costs to UK consumers of ignoring the opportunities to share resources with European neighbours will become too large to ignore.

However, capturing the benefits will involve significant institutional changes in the way the system is planned and operated. Government policy aims to establish a series of credible technology pathways towards a low-carbon power system and this involves deploying a range of renewable technologies. The costs of renewable deployment to UK consumers can be reduced significantly if the cost burden is shared and the location of resources is optimised over a larger geographical region. The UK Government should therefore work with neighbouring member states to establish a regional system for driving forward the deployment of renewables. Moreover, it is vital the UK Government reviews the compatibility with the EU single market of current policy delivery mechanisms. In particular, the current capacity mechanism should be reviewed in the context of delivering resource adequacy at a regional level.

Regulators must also work more closely, both with each other and with Government, to ensure the network infrastructure is optimised at the regional level. The network needs to be planned such that it creates options for a range of technology deployment scenarios and allows resources to locate in the best place regionally. There are particular opportunities to ensure that network infrastructure decisions are taken that will enable the resources in the North Sea to be efficiently utilised.

Independent system operators (ISO) have become a standard feature of electricity markets around the world but have not been adopted in Europe. The increase in complexity of market

operation and the need to ensure resources (generation, network and demand) are employed optimally suggest that the time is right to establish a GB ISO, with an eye toward regional integration of system operation. Apart from ensuring that generation, network and demand resources are treated on a level playing field, an ISO can work closely with neighbouring system operators to ensure resources are used efficiently across a larger geographical area. Indeed, it would be the first step towards creating a regional ISO charged with the efficient operation of the market at a regional level.

**Review policy delivery mechanisms**

Policy interventions are a reality of the electricity market and this situation is likely to continue into the future. Current convention is to adopt broad ranging economic measures (market wide capacity mechanisms, ‘technology neutral’ CfDs, carbon prices) to seek delivery of policy outcomes at least cost. However, experience suggests that these mechanisms have a number of significant drawbacks.

Firstly, Government has a strategic role to play in creating the options for a range of future technology pathways by ensuring a flexible and dynamic infrastructure and a diverse resource base. However, conventional mechanisms tend to pick technologies that ‘win’ on the basis of the particular auction design (e.g. £/kW/annum in the case of capacity mechanisms) and, therefore, are unlikely to bring forward an appropriate diversity of resources.

Secondly, the mechanisms are policy interventions that can be removed just as easily as they were introduced. This creates a significant policy risk for investors who will therefore seek extensive evidence that the mechanism in question will endure for a sufficient period. As a consequence, high prices are likely to be required for a long period before the mechanism gains the confidence of investors. For example, the carbon prices that would be necessary to effectively decarbonise the power sector over the required timescales are difficult to envisage given current political standards. Also, it is worth noting the concern that is currently being expressed in the New England power market in the US where capacity market prices are now rising to the levels that are needed to attract investment in new capacity. It is interesting to speculate how politicians in the UK may react to a similar spike in capacity prices.

These mechanisms are, therefore, self-perpetuating and require market participants to believe they will endure to create the necessary investment conditions. Therefore, far from being ‘market’ mechanisms, they actually establish obstacles that undermine the stated aim of Government to progressively reduce the level of intervention in the market. A final problem is that market-wide mechanisms will deliver increased profits to existing assets that do not require the increased revenue to fund investment. These windfall profits create large and unnecessary costs to consumers.

A much more credible policy narrative would involve clear action to create an active demand-side to the market coupled with targeted strategic interventions to deliver policy objectives until such time that a sufficient proportion of demand can adjust to market price without any loss in utility. The key tools available to policy makers are regulations to ensure the timely closure of high carbon resources and targeted support mechanisms to ensure investment in an appropriate mix of low-carbon resources. Progressively tightening emission performance...
standards provide an effective and widely adopted mechanism that allows existing assets to efficiently plan their glide-path to closure. They can be designed to avoid capacity ‘cliff edges’ as well as signaling a clear market opportunity for low-carbon replacement assets.

Targeted support mechanisms can then be used to attract an appropriate mix of resources. This would include renewables, fossil generators with carbon capture and storage, demand response, electricity storage and flexible generators. The form of the mechanism could be varied to ensure that it is appropriate to the particular technology requirement thereby avoiding the biases inherent in ‘technology neutral’ approaches. Importantly, adopting targeted mechanisms to achieve policy outcomes will save significant costs for consumers now and, if associated with reforms to improve the operation of energy markets, are much more consistent with the transition to a genuine two-sided and low-carbon market that will ultimately require far less intervention on the part of Government.

The challenge for the new Secretary of State

The incoming Secretary of State for Energy and Climate Change faces some major decisions. The current market framework is seriously flawed but it is not about to collapse. It will be possible to get by for the next few years with a number of relatively minor tweaks to the arrangements. However, such tweaking will not lead to significant changes in outcome and we will be left with a system that is high cost and vulnerable to policy failure.

Addressing this situation will not be easy. This paper sets out three key policy areas which present the potential to significantly reduce costs and improve the robustness of policy delivery. To progress each area will require some bold policy initiatives – in some cases challenging the conventional wisdom that has developed over a number of years. This agenda, therefore, represents a major opportunity for the new Secretary of State and the benefits of rising to the challenge will be significant. Ultimately these issues will need to be addressed but, the sooner Government rises to the challenge, the greater the benefits will be.
Appendix: Review of proposals for market reform tabled by Professor Helm in February 2015

There has been relatively little discussion on the need for the new Government to initiate a process of electricity market reform. The proposals recently tabled in early 2015 by Professor Helm are, therefore, worthy of debate. He suggests the need for a three-pronged reform package: a Pool wholesale market; a unified capacity and FiT auction (or a two-stage auction if technology choice is to be made by government), and a default tariff. He argues that such a package would put the electricity industry on a sustainable basis, maximising workable competition in the context of rapid and disruptive technical change.

Despite this confident assertion, the paper contains little analysis of how the market context will change over the next 5-10 years and the challenges that this will create. Indeed, much of the rationale for the proposed changes is based on ‘righting’ the perceived ‘wrongs’ associated with the introduction of the NETA market design in 2001. Whether or not these changes were right at the time, the challenges we face now, and will face in the future, are different and deserve more critical assessment.

Trading arrangements define the scope of ‘organised’ markets and establish the rules to determine payments for services provided and the mechanisms for recovering costs. The current GB system involves a range of organised markets procuring different services over different timescales (energy balancing, ancillary services, capacity, renewable energy, etc.). Ideally, these markets would work in harmony such that overall resource costs are minimised in delivering the combined package of services required. Both NETA, and the previous pooling arrangements, were based on the presumption that there was no benefit in seeking to simultaneously minimize resources needed to deliver system and energy balancing requirements (so-called ‘co-optimisation’). The significant increase in variable renewable generation, much of which is embedded at the local level, calls this into question. There is a strong argument that new approaches will be required to ensure efficient overall utilisation of resources and this may involve changes in the way organised markets work. Therefore, consideration of the need for a ‘Pool’ should go way beyond the issue of short term market liquidity and address the significant challenge of market integration of intermittent renewable generation.

Discussions about the need for capacity markets are as old as energy markets themselves and this is not an issue that can be proven one way or the other. However, Helm’s assertion that ‘capacity margins have tightened so significantly as to require immediate short term interventions’ is highly questionable. The results of the first capacity auction in 2014 clearly demonstrate that there is significant surplus capacity and little or no requirement as yet for new investment. Nevertheless, it is fair to argue that central procurement of resources has become a critical element of the current market and it is vital that this procurement works as efficiently as possible.
Conventional economic arguments suggest that technology neutral auctions are appropriate, supported by broad ranging price signals such as a carbon tax, and Helm’s proposals fall into this camp. However, this approach is flawed in a number of respects. Firstly, the role of policy interventions is to risk-manage future delivery of policy objectives in an uncertain future through creating a number of feasible technology pathways and this requires a diversity of resources. Technology neutral approaches cannot be expected to deliver a strategic level of diversity. The key policy challenge is, therefore, to identify an appropriate mix of resources that ensures the UK energy system is resilient to credible risks and shocks at an acceptable cost. What Helm dismisses as ‘the Government picking winners’ is in fact the key role of policy that requires critical analysis and joined-up thinking. Indeed, given the wide diversity of cost structures and capabilities among potential service providers, one could argue that a technology neutral auction that favours those resources with the lowest per-MW capital cost is itself a form of ‘picking winners’. The issue of auction design to support efficient procurement of resources is, therefore, a second-order issue.

A second problem is that the economic rationale for broad-ranging price signals, such as technology neutral capacity auctions and carbon prices, requires that they become an established and long term element of market design. In the long run, these mechanisms may well give rise to efficient outcomes provided that politicians are prepared to put up with the excessive and sustained prices that would be necessary to build up confidence amongst investors. But energy policy demands responses from market actors over the short term and there is no evidence that investor confidence can be established quickly enough. This is a major challenge for energy policy and requires a re-think on the part of policy makers. The adoption of targeted procurement approaches and standards (such as an emissions performance standard) presents a far more promising way of delivering action in the required timescales whilst containing costs to consumers and avoiding windfall profits.

The final issue tackled by Helm involves the need for a ‘default tariff’ to provide the necessary consumer protection. He is right to challenge the sacred cow of retail competition and the desire to promote switching between suppliers. It is difficult to envisage how the competitive retail markets can drive efficiencies in energy procurement that will ultimately feed through to significant benefit for all customers. On the other hand, as he points out, there are a range of smart technologies that have the potential to both improve the lives of customers and allow demand to be adjusted in response to market price signals. This could dramatically reduce consumer costs and improve the range of services offered and the focus of market development should be on capturing these potential benefits. However, this will require more fundamental reforms than those envisaged by Helm (see main text).