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MARKET DESIGN FOR THE ENERGY UNION THE INSTITUTIONAL STRUCTURE FOR A FLEXIBLE AND INTEGRATED ENERGY MARKET

SIMON SKILLINGS, TAYLOR DIMSDALE, MANON DUFOUR

Building an 'Energy Union' with consumers at its core represents an opportunity for Member States grappling with the challenge of securely decarbonising energy systems at least cost: now is the time to review the nature of markets and institutional structure. Major changes, not minor tweaks, will be necessary to deliver such a far-sighted vision.

Summary

- > A series of major changes have, and are continuing to, transform the energy landscape since the EU embarked on the process of energy market liberalisation. It is now clear that there is a **significant role for governments and regulators in determining certain market outcomes and ensuring a more integrated approach** – along the value chain between generation, networks and demand, across borders between Member States and between power, heat and transport sectors.
- > The effective functioning of markets therefore depend on a **coherent and stable policy environment and an institutional structure** that effectively delivers the required outcomes.
- > No amount of changes to market rules will matter unless the underlying political conditions deliver policy coherence. Two issues are of paramount importance: 1/ Member States should be prepared to establish clear national delivery plans and submit these to an independent body for scrutiny; 2/ They should also agree a framework to secure funding for the energy transition and define how the costs should be allocated between consumers.
- > The key institutional issue for the internal energy market (IEM) is to **establish a structure that makes it easy for Member States to share resources at the wholesale electricity level**, should they wish to take advantage of these opportunities. Those aspects of the wholesale electricity market that have the potential to deliver particular cost savings are those which are typically delivered by regional independent system operators (ISOs) in other international power markets. Establishing such a structure within the IEM would have significant advantages and this should be investigated as a matter of urgency.



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- > **Placing consumers at the heart of the market demands a policy response that goes way beyond the current agenda** which will essentially restrict participation to large or very well-informed consumers. Whilst this will deliver some improvements in market efficiency, it will fall far short of maximising the system benefits from demand side engagement and will fail to deliver the wider economic and social benefits associated with a smart, IT-enabled society.
 - > **Now is the right time for the EU to initiate a fundamental review of consumer-facing markets.** This needs to reconsider the way choices are presented to consumers so that it becomes easier for them to reduce costs and improve lifestyles. The right approach will inevitably vary widely from region to region and city to city, particularly as heat and transport sectors begin to converge with electricity. The EU must create a new framework that ensures consistency with the IEM, encourages sharing of best practise and allows innovation and diversity of approach at the local level.

1. Introduction

The EU Commission has set out a vision for an Energy Union in which all Member States work together to meet the challenge of creating a secure and decarbonised energy system and which places more emphasis on the role and needs of consumers. At the heart of the energy system lies a set of market arrangements that determine the decisions companies make and the outcomes that ensue – the so-called internal energy market (IEM). It is, therefore, critical that the design of the IEM is aligned with the goals of the Energy Union.

Unfortunately, evidence to date suggests that the IEM in its current form is not capable of delivering the Energy Union vision. There are two key aspects of the current arrangements that appear particularly deficient. Firstly, there is limited sharing of resources between Member States and mechanisms to deploy low carbon energy sources and maintain security of supply are largely national in scope. Secondly, the majority of consumers continue to purchase energy in the same way as they have done for many years despite the wealth of new technology available to help them reduce energy costs and deliver lifestyle benefits.

It is, therefore, important to review the status of the energy market and consider how it might be reformed to better support delivery of an Energy Union with consumers at its core.

The EU Commission recognises that there are deficiencies with the current market and recently issued a consultation on the need for changes going forward¹. This briefing note describes the ideas put forward by E3G in response to this consultation. The central message of this response is that it will not be easy to achieve the goals of the Energy Union and the reform agenda must go beyond small tweaks to the current arrangements. This note does not, therefore, claim to offer any ‘silver bullet’ solutions. Instead, it seeks to clarify the nature of the problems and point towards some promising areas for further consideration.

2. The shortcomings of the IEM

The market design consultation identifies a number of areas of concern with the current situation. These range from problems with the implementation of existing regulations through to the lack of progress in developing regional co-operation and improving consumer

¹ <https://ec.europa.eu/energy/en/consultations/public-consultation-new-energy-market-design>



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engagement. A number of more detailed technical questions are also explored relating to the efficient operation of electricity markets with high proportions of variable renewable generation including, in particular, how to maintain resource adequacy.

It is important to recognise that markets are designed to achieve particular outcomes and the ‘right’ design will vary over time as circumstances evolve. Electricity market liberalisation was first conceived and implemented in the 1980’s and 1990’s. It was based on the premise that the role of governments and regulators in determining market outcomes would progressively reduce over time. This underlying objective has acted as a compass guiding the thinking of market designers ever since. In effect, they have sought to reveal prices that would drive efficient operational and investment decisions by large players (generally generators) connected to the central transmission system.

Since this vision for the market was first conceived there have been a series of major changes that were not foreseen at the time. Indeed, we are just beginning to see the impact of these changes and they can be expected to become increasingly significant. The changes are:

- > **Decarbonisation** – This requires the rapid deployment of a variety of low carbon technologies that are not currently cost-competitive with high carbon alternatives. Despite the initial ambition that this cost discrepancy could be addressed through carbon pricing, it has become apparent that these resources can only be financed and deployed at scale with direct support from governments. In other words, governments have a critical and active role to play in driving investment. Moreover, it is also evident that government cannot purely focus on investment since this is significantly affecting the supply demand balance and, unless the withdrawal of high carbon resources are managed in some way, there is a risk of chaotic and unpredictable impacts on security of supply.
- > **Decentralisation** – There have been significant increases in the amount of generation connecting to the local distribution network, much of it variable renewable in nature. Also, increasing levels of demand response manifest directly at the local level. Hitherto, the distribution network has been largely ignored by the market arrangements and assumed to operate passively and independent of transmission network operation. This assumption is no longer valid and attempts to introduce accurate prices to drive market efficiency would need to take into account the impacts on the local network.
- > **Integration of variable renewables** – It is no longer possible to forecast the requirement for power from non-renewable sources more than a few hours in advance. Indeed, this residual demand is reducing, volatile and, occasionally, negative. The power system therefore needs to be more flexible and resilient than was previously the case to ensure that supply and demand remain balanced. This, in turn, requires that the transmission network is integrated over wider geographical areas and markets are effective in attracting the right mix of flexible resources.
- > **Consumer digital revolution** – Consumers have traditionally taken power from the system with little regard to short term costs. Only a few highly motivated and well-informed consumers have focused on how much they consume and when it is consumed. However, the advent of an array of digital technologies raises the potential for a wide spectrum of consumers to engage with the market without the need for significant personal effort. This latent demand resource could dramatically reduce the need for supply side resources



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and significantly reduce the costs of delivering a decarbonised and secure energy system. However, consumer take-up of these new opportunities has been slow and it is not clear that the current market arrangements make it sufficiently attractive for widespread adoption, thereby obstructing any potential revolution in consumer behaviour.

- > **Integration of sectors** – There remains more practical and affordable options to directly decarbonise the electricity sector than is the case with the heat and transport sectors. Therefore, decarbonisation of heat and transport through electrification is a central component of longer term energy policy in many Member States. This, in turn, suggests that there will be an increasing integration of the sectors and the requirement to coherently plan infrastructure to avoid stranded assets and wasted costs.

These changes are wide ranging but one major implication stands out. **There is evidently a significant role for governments and regulators in determining certain market outcomes and ensuring a more integrated approach** – along the value chain between generation, networks and demand, across borders between Member States and between power, heat and transport sectors. It is, therefore, inappropriate to design markets on the basis that the orchestration of outcomes is a limited and diminishing feature. Importantly, this means that the required reform of the energy market is not merely about improving and refining trading rules. Instead, it is necessary to re-think the governance and institutional structure of the market to accommodate the significant and evolving role of Government. Above all, there is a need for a new and widely shared narrative that explains the role that governments will need to play in the market going forward. Without such a narrative, there is a risk that each intervention will be viewed negatively by the investment community, leading to higher financing costs as they struggle to quantify and manage the perceived increase in policy risk.

This note focuses on the questions of governance and institutions that need to be addressed. It also considers the issue of engaging and animating the demand side of the market and explores how these institutional questions are fundamental in considering the appropriate market design.

3. The political conditions for policy coherence

Creating the right political conditions is fundamental if system decarbonisation is to be achieved cost-effectively and this will inevitably mean that governments must be prepared to take some tough decisions. Without this, there is a risk that policy will continually be driven by short term political expedients, significantly raising the costs of finance for the required investment and increasing the likelihood of policy delivery failure.

Firstly, it is important to ensure policy coherence over time and between EU Member States since this reduces the perception of policy risk and reduces financing costs. This demands that EU governments are prepared to set out how they intend to meet longer term energy policy targets and submit these plans for scrutiny by an independent expert body. Such a body would be able to provide advice on how objectives can be delivered more cost effectively, including through sharing resources with neighbouring Member States, and identify where significant risks exist for policy delivery failure. The final policy decision would, of course, remain with national governments, however a transparent process of public scrutiny and discussion over the key aspects of energy policy would make it less likely that significant



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changes in policy are introduced unless there is a clear evidence-based justification. Box 1 below explains how this might be achieved.

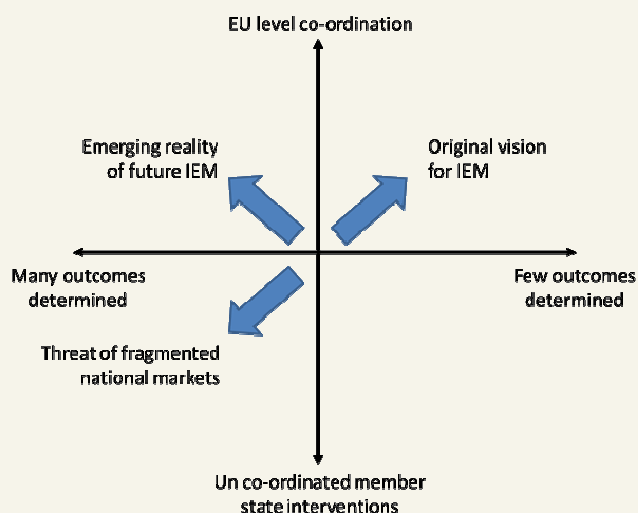
Box 1: The Climate and Energy Observatory

The Climate and Energy Observatory would be the independent expert body responsible for scrutinising Member State policy delivery plans and providing advice on how outcomes might be achieved more cost-effectively.

The IEM agenda has hitherto based on increasing levels of physical integration and market liberalisation. Significantly reducing the number of centrally determined outcomes has been an important aspect of this agenda due to the difficulty in getting 28 Member States to collectively agree on which outcomes should be fixed and how they should be fixed. The changes described in Section 2 of this paper challenge the premise that an IEM could ultimately function effectively with few if any significant market interventions and Member States have recently introduced a series of new measures in response to these developments. Indeed, current market governance structures mean that these central actions can be introduced most readily at the national level rather than the EU level. This, in turn, creates the prospect of a system which becomes fragmented and inhibits the creation of a truly integrated and efficient energy market.

The EU Commission is currently exploring how the IEM should be designed to cope with this new emerging situation. It has produced a set of state aid rules and has launched a sector inquiry to investigate the impact of capacity markets on the IEM. DG Competition is thus building expertise in energy systems to support their role of guardian of the internal market. It is, however, not clear that DG Competition will be able to maintain a detailed knowledge of the energy system and devote the necessary time to analyse future policy delivery in Europe's complex and fast changing energy context. This suggests that a new institutional design may be required to establish and retain the integrity of the IEM in the years to come.

This challenge is illustrated in the following chart:





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A Climate and Energy Observatory could have an important role to play in preserving the integrity of the IEM going forward. Although the primary role of this new institution would be to explore the future policy delivery landscape and identify where risks to policy delivery are being effectively managed and where they are not, this will have important ramifications for the IEM.

Market processes are effective in managing many future risks. However, there is little evidence that the market can provide the diversity of resources that insulates the system from major systemic failures (e.g. supply interruptions arising from geopolitical or industrial disputes, or major technology failures). These issues are particularly relevant to system decarbonisation which requires the rapid deployment of technologies that are not mature. An effective energy policy must therefore establish a number of credible pathways to decarbonisation that ensures policy delivery is not dependent on big technology 'bets' (e.g. the ability to rapidly deploy large volumes of nuclear energy or carbon capture and storage) and promotes the opportunities afforded by new emerging technologies. In addition, the energy system contains a number of natural monopolies and these need to be regulated in a way that works coherently with the market and leads to least cost overall outcomes.

A Climate and Energy Observatory has the potential to possess the capability to understand how market and regulatory risk management processes can work effectively together to ensure future policy delivery in addition to understanding the underlying systemic risk landscape.

The Observatory would, therefore, be able to work with Member State governments to help ensure that policy objectives are being delivered effectively and not exposed to poorly managed risks. It would be able to analyse National Energy and Climate Plans (as required under new 2030 governance arrangements) and propose how policy could be delivered more cost-effectively. Unless policy actions are actually harming other Member States, the final decision on policy should remain with Member State governments. However, the Observatory process will ensure a transparent public debate over decisions to intervene in the market and how the costs of interventions might be minimised.

Key functions of the Observatory directly relevant to the IEM would be able to:

- > Identify the impact on future policy delivery of Member State decisions on energy mix including where the actions in one Member State has material implications for the risk profile of its neighbours,
- > Explore how future policy outcomes might be delivered more cost-effectively, for example, through resource sharing between Member States,
- > Consider where infrastructure investments (including both network and efficiency investments) might be effective in improving policy delivery,
- > Provide advice on research and development to fill key technology gaps.

This technical and policy analysis would not necessarily require new and separately funded resources. It could either operate as a 'virtual' body using expert resources and



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analysis provided by Member States and the Commission or it could ‘piggy-back’ an existing independent organisation such as the European Environment Agency or the Joint Research Centre. However, the independent nature of this body would be critical since this is necessary to build broad consensus, both within the policy-making community and amongst stakeholders, on the nature of the energy landscape through objective and evidence-based analysis. If successful, it has the potential to dramatically reduce the chilling effect on investment caused by uncertainty about the future which threatens the ability to respond to security concerns and challenges Europe’s growth prospects.

The second important issue to address involves **establishing a clear framework to ensure the energy transition is adequately funded and to define rules for how these costs are allocated.** The consensus of economic modellers is that the transition to a low carbon economy is affordable and, conversely, the costs of failing to act are high. The challenge, therefore, is to find the cheapest way to deliver decarbonisation objectives. The independent policy assessment process described in Box 1 above would be critical in this regard and would ensure that any moves to step back from the decarbonisation agenda are subject to public scrutiny and debate. Governments should, therefore, be prepared to commit to deliver the necessary funding within this high level governance framework. A somewhat more complex subsidiary challenge involves how these costs should be allocated. This would need to address both the issues of equity, whereby the both the costs and benefits of investment are spread in an appropriate way across citizens, businesses and industry, and how costs should be shared between EU Member States as part of a truly integrated IEM.

These are the political conditions that are necessary to establish an Energy Union with consumers at its core. They are a necessary prerequisite for designing markets that will deliver a secure and decarbonised energy system.

4. Delivery bodies and institutional structure

The market and regulatory design must address the challenges ahead through allowing greater coherence along the value chain, across borders and between sectors as well as establishing a clear narrative for the role that governments and regulators need to play in the future. **An institutional structure must be adopted that ensures government objectives are delivered and that takes maximum advantage of the integration synergies available.**

The energy system is complex and wide-ranging. It is both politically and practically inconceivable to envisage a single EU planning body able to optimise policy delivery or, alternatively, imagine that it might be possible to establish a holistic pricing framework that enables market forces to deliver all the desired outcomes efficiently. Governments must, therefore, define a multi-faceted delivery framework with clearly identified delivery bodies responsible for delivering the key policy outcomes and designed to take advantage of the most promising opportunities to leverage integration synergies and reduce costs.

Delivery bodies are already common in the energy system: system operators are responsible for ensuring systems operate within statutory operational limits, government departments are responsible for allocating funding to renewable projects and regulators are responsible for ensuring that energy networks meet the needs of future customers. However, existing bodies



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are poorly positioned to capture the major opportunities to drive out cost savings through optimising across borders, along the value chain and between sectors.

The institutions underpinning the IEM need to focus on those aspects of policy delivery that would benefit most from resource sharing across borders. Analysis has repeatedly shown that huge savings are available at the wholesale electricity level from integrating policy delivery and markets at a regional, or even European, level. However, at the moment, Member States are expected to design their own institutional framework from scratch on a bespoke basis should they wish to take advantage of genuine resource sharing opportunities (e.g. institutions to allocate subsidy to renewable generators cost efficiently across a pan-national geographic footprint). This creates huge hurdles for the establishment of a truly integrated IEM.

An alternative approach would be to establish an institutional structure on the presumption that Member States wish to share resources. It is important, however, that this structure still allowed Member States the freedom to deliver solutions on a purely national basis if desired. Also, the structure should avoid those aspects of policy delivery that have little to gain through pan-EU co-ordination and these can be left to Member States to design as appropriate.

Those aspects of the wholesale electricity market that have the potential to deliver particular cost savings include renewable generation procurement (e.g. FiT/premium allocation), capacity and other system services procurement to deliver resource adequacy and system balancing, network planning/system architecture, market operation and market surveillance. These functions align closely with those undertaken by regional independent system operators (ISOs, see Box 2) which are common in other international power markets. Establishing such a structure within the IEM would have significant advantages and this should be investigated as a matter of urgency.

Box 2: Independent System Operators

Independent System Operators (ISOs) are bodies responsible for the efficient operation of power (and gas) systems and the associated markets. They are independent and fully unbundled from all asset owners (including the transmission network owners) and are responsible for ensuring open and equitable access to the system. The primary responsibility of an ISO is to ensure short-term reliability of the grid and it designs markets and procures services to ensure this is delivered at least cost. This requires that markets operate competitively and one of the key obligations on ISOs is to retain the capability to monitor player behaviour and detect market abuse. The delivery requirements of an ISO can also include the management of renewable subsidy schemes and the maintenance of longer term resource adequacy standards.

A regional ISO would, therefore, be obliged to ensure resource sharing across Member States in order to fulfil its mandate of least cost policy delivery.

5. Putting customers at the heart of the energy market

In February, EU Commission Vice President Šefčovič set out his intention 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



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vulnerable consumers are protected. This is an important and significant statement of intent and one that demands a policy response way beyond the current agenda.

Policy makers have a poor record when it comes to thinking from the perspective of the consumer. **Despite many years of market liberalisation, the vast majority of energy customers remain passive, distrustful and disengaged.** Markets are currently designed to suit the characteristics of large power stations and consumers are assumed to act as perfect rational economic agents – with all their actions driven purely by market price and any economic benefits that accrue.

Those initiatives that are looking to promote more flexibility in energy consumption tend to be focused on trying to ‘level playing fields’, ‘remove barriers to entry’ and ‘sharpen price signals’. Whilst there will be a range of consumers who are sophisticated and able to devote the time and effort that leads to rational economic decisions, these consumers are likely to be in the minority. **Pursuing a reform agenda that is constrained by current market paradigms will inevitably restrict participation** - essentially to these large or very well-informed consumers. Whilst this will deliver some improvements in market efficiency, it will fall far short of maximising the system benefits from demand side engagement and will completely fail to deliver the wider economic and social benefits associated with a smart, IT-enabled society.

In reality, the majority of businesses and citizens will take quick decisions that are plagued by psychological biases. Helping consumers to arrive quickly at the best decision for them is the real challenge that needs to be tackled if the vision outlined by Vice President Šefčovič is to be realised. This vision seeks the engagement (or protection) of all consumers and this can only be achieved by fully understanding their needs and their role in the future energy systems. The requirement for a fundamental re-think has already been recognised in New York State, which has initiated a comprehensive reform process that aims to place energy efficiency and other distributed resources at the heart of the market (see Box 3 below). This process has identified that some radical changes are required.

An evolving regime of product standards will be important and should be designed to make it easy for consumers to offer demand flexibility and reduce consumption. However, it is unlikely that standards by themselves will be enough. **The EU must be prepared to initiate its own review of market process and, importantly, must not be constrained by the paradigms of the past.** For example, it is likely that most consumers would prefer a system in which they have clear and simple choices about how they consume energy rather than merely who they buy it from. This would make it easy for them to identify and adopt the choice that makes their lives better and, conversely, difficult to ignore the opportunities. This, in turn, may require a single point of contact for consumers who can present the options available in a clear and simple way. The complexities of energy system operation must be completely hidden and resolved internally within the industry – for example, whether the benefits of demand response arise from reducing energy purchase costs or avoiding expenditure on the local distribution network. Unfortunately, it is not obvious how this might be readily achieved through the current unbundled and deregulated system.

The ambition of such a review should not be to produce a single all-embracing EU retail market framework. Circumstances and opportunities will vary enormously from region to region and city to city. In some areas there may be a realistic prospect that sophisticated marketers can animate a wide cross section of the community within the current liberalised



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market framework. However, in many others, the industrial structures are already in place to effectively deliver combined network and energy supply services within a regulated framework. Moreover, there is most to gain at the local level from adopting an integrated approach to the development of electricity, heat and transport infrastructure and the optimum technology mix will vary considerably from place to place. Local energy systems need to be designed to deliver least overall costs to consumers and this requires institutional co-ordination and deep consumer insight. It is not credible to manage this at an EU-level and the smart local markets of the future will inevitably display significant diversity across Europe.

Nevertheless, there is an important role for the EU-level policy process in ensuring that Member States develop and implement policy in a robust and transparent way whilst allowing flexibility of approach that reflects differing local circumstances. Local consumer-facing markets should interface effectively with the integrated IEM and processes should be in place to help leverage learning across Member States and drive innovation in the local policy delivery frameworks. **Above, it is appropriate for the EU to trigger a fundamental review for the operation of consumer-facing markets and how these can function most effectively within the context of the IEM.**

Box 3: New York State Reforming the Energy Vision (REV)

In 2014 the state government of New York adopted a new Energy Plan that set out ambitious targets for emission reductions, clean energy deployment and energy efficiency. It also recognized that achieving these objectives without putting reliability at risk would require fundamental changes to the power system, including new business models for utilities, and reform of regulatory ratemaking and electricity market design.

In response, the state Public Service Commission (PSC) has launched one of the most ambitious electricity market reform efforts underway in the United States, called Renewing the Energy Vision (REV). With the launch of the REV, the PSC has proposed to transform New York's electric industry to "make energy efficiency and other distributed resources a primary tool in the planning and operation of an interconnected modernized power grid." The PSC has also recognized that new technologies mean customers can now play more active role in least cost, reliable and renewable energy.

The reform effort is following two tracks:

1. Reform of the role of distribution utilities in enabling market-based deployment of distributed energy resources;
2. Reforms required in current regulatory, tariff, and market designs and incentive structures to better align utility interests with achieving the Commission's policy objectives.

Under the plan, existing utilities will coordinate distributed system platforms (DSPs) to manage bids from a wide range of distributed energy providers. The DSP is essentially the local equivalent of the New York Independent System Operator (NYISO) and serves as a retail-level dispatcher to the distribution and transmission grid for both traditional power plants and distributed resources. Resources provided by the platform providers (DSPPs) are likely to include energy efficiency, demand management, demand response,



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distributed generation, and microgrids. The decision to allow incumbent distribution utilities to run DSPs was based on their knowledge of existing distribution systems operation, relationship with the ISO and knowledge of the customer base.

Working Groups with a wide range of stakeholders were formed early on in the process and white papers have been released with recommendations on reforms to ratemaking and utility business models as well as market design for the distributed system platforms. Utilities are also required to put forward demonstration projects which should provide valuable information to the PSC prior to implementation of the market and regulatory reforms. Projects that have been put forward so far include energy efficiency retrofits, micro-grids, and new interconnection technologies for distributed resources.

It is too early to draw many lessons learned – utilities are not required to file implementation plans until July 2016. But the REV clearly represents an ambitious and potentially transformational effort. Critically, REV will be supported by other existing institutions including New York’s Green Bank, which will be providing finance for innovative low carbon solutions from third party energy providers. Due to overwhelming demand from clean energy project developers, the New York State Energy Research and Development Authority (NYSERDA) which sponsors the bank has asked the PSC for permission to give the bank borrowing powers to raise additional finance through private markets.

About E3G

E3G is an independent, non-profit European organisation operating in the public interest to accelerate the global transition to sustainable development. E3G builds cross-sectoral coalitions to achieve carefully defined outcomes, chosen for their capacity to leverage change. E3G works closely with like-minded partners in government, politics, business, civil society, science, the media, public interest foundations and elsewhere.

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