Is an Energy Supply Company a smart choice for Housing Associations and the communities that they serve?

More than Warm Wishes

TheRenewablePowerExchange

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Introduction

Project Overall Aim

A partnership of seven Registered Social Landlords (RSLs), working together with The Renewable Power Exchange (RPE)[1] and others, obtained development funding from the Scottish Government's Warm Homes Fund to test the potential of establishing a vertically integrated Energy Services (supply) Company (ESsCo)[2] generating renewable energy and targeting supply to low income households.

The scoping work was undertaken as seven workstreams, with a different RSL leading on each work strand. This report outlines the findings and recommendations of all seven workstreams:

- Payment Methods - Grampian Housing Association
- Metering - West Highland Housing Association
- Electricity trading - Kingdom Housing Association
- Renewable generation strategy - Berwickshire Housing Association
- Legal framework - Clyde Valley Housing Association
- Regulatory framework - Trust Housing Association
- Financing structure - Castle Rock Edinvar

Each chapter covers a different workstream and the Executive Summary at the beginning draws them together.

Executive Summary

Context

Across the UK, over five million households, about 20% of the population, were estimated to be living in fuel poverty in 2012. This percentage increases to 35% in Scotland. The Scottish Government' has a commitment to tackling and eradicating fuel poverty and in addition, aims for 50% of Scotland's electricity demand to be met from renewable energy by 2015.

A partnership of seven Registered Social Landlords (RSLs), working together with The Renewable Power Exchange (RPE), obtained development funding from the Scottish Government's Warm Homes Fund to test the potential of establishing a vertically integrated Energy Services (supply) Company (ESsCo,) generating renewable energy and targeting supply to low income households.

The RSL partners and RPE share a vision, in which they seek to:

- Address the inequity in energy supply pricing by generating renewable energy and establishing a supply company aimed at low income customers;
- Tackle the 'poverty premium' where low income customers pay a higher price for their energy because of their payment method - typically pre-payment meter or cash payment - which is a major contributor to fuel poverty in the UK; and
- Establish a vertically integrated supply chain, with secure sourcing of renewable energy through a range of generation schemes, enabling the supply of affordable energy to low income customers.

The RSL partners provide housing across Scotland and have a customer base of over 20,000 tenants. The Warm Homes Funding provided the RSLs and RPE with the opportunity to scope putting their vision into practice.

Benefit to RSLs

The RSLs collaborating on this project consider that there is a market failure in the energy sector which impacts disproportionately on their tenants. This means that, despite investing heavily in insulation and energy efficiency on their properties, a significant proportion of tenants remain in fuel poverty. They are therefore keen to see their tenants costs for energy reduced as one of the few remaining interventions to address this issue.

RSLs also recognise that while cheaper tariffs makes tenants' energy more affordable, therefore reducing the impact of fuel poverty, it also means that tenants will have more disposable income. Anything that increases the disposable income for tenants makes tenancies more sustainable helping to reduce:

- rent arrears
- evictions
- turnover of tenancies and
- void periods

all of which benefit social housing providers as well as the tenants.

The RSL partners therefore are actively seeking solutions to this intractable problem.

The Workstreams

The Warm Homes Fund enabled seven inter-related workstreams to be investigated and these are considered below:

Renewable generation

Whilst growth in renewable generation in the UK has been less than in other parts of Europe where finance, policy and other incentives have been stronger, in the UK, Scotland has led the way in the development of community owned generation schemes.
Community owned renewable generation provides a great opportunity to obtain a local gain from the installation of generating technologies. Tying this in with a local supply means that the energy generated can also be used to impact on fuel poverty.

An ESsCo with a generation arm has a number of advantages: providing a way for the ESsCo to meet its renewables obligations; providing the ability for scaling up; achieving an additional profit line; and most importantly, providing price certainty for the duration of the generation sites.

The development of community owned generation has created many opportunities and challenges. However, the growth in community owned generation has made little impact on fuel poverty objectives. Given the ambitions of the partner RSLs and RPE, an ESsCO could provide the opportunity to grow generation and make a very local impact on fuel poverty through control of costs and supply of energy.

An ESsCO with RSL involvement/ownership could build a platform of skills, resource and reputation, and act as a prime developer or partner in the development of local generation schemes. This would enable RSLs with readymade expertise, funding developer experience and packages to deliver specific schemes within a shared or collective vision.

Legal framework

In setting the legal structure of the ESsCo, it is recommended that close reference to founding principles, finance and other requirements, inform a bespoke legal design process that should produce an enabling structure for a new ESsCo to meet its future aims.

Research indicates that a new ESsCo should be established with social goals alongside conventional financial targets and as such will need to ensure that its social mandate is protected and is central to the future development of the business. A governance structure should be set-up that involves a balanced representation between the main stakeholders and expert non-executives. Clear founding principles with secondary and tertiary objectives should be put in place, both as guides for future decision making, but also benchmarks for the organisation, at all levels, to measure itself against. These should be captured in a comprehensive business plan, that will act as the blueprint for agreed plans and act as both a unifying document, and as a reference for performance

against agreed targets, both social and conventional.

Regulatory frame work

The gas and electricity supply industries are complex, with demanding regulation and codes. As well as competition being a driver of performance and customer satisfaction, suppliers act as an important vehicle for government policy, for example in implementing energy efficiency measures, collecting subsidies for renewable energy generation through their tariffs and acting as delivery agents for important technological change, such as the smart meter introduction.

In applying the legal and regulatory framework to an ESsCo, there do not appear to be regulations that prevent RSLs from being part of setting up an energy supply company and offering a service to their tenants.

The ability to meet the supplier regulatory requirements can also be met in a number of ways and can take advantage of the developing 'supported entry' services provided by major systems developers.

Electricity trading

Electricity is generated, delivered and used in a continuous manner in the UK. Supply must always match demand, as electricity cannot (generally) be stored. Although the process is continuous, for the purposes of trading and settlement, electricity is considered to be utilised in half hour chunks called 'settlement periods'.

Entering the market as a supplier involves a range of responsibilities and risks. New suppliers need to effectively cover customer relationship management, operational delivery and industry management. A wide range of cost considerations apply to the balancing and settlement process for a new ESsCo entering and operating in the market, however industry software service providers are increasingly offering holistic solutions to new entrants.

Metering

The roll out of smart meters presents a unique opportunity for a new ESsCO. The timing of the roll-out of 2nd generation meters – to include a pay-as-you-go functionality - will allow for a vastly improved service to pre-payment customers, as well as making an attractive proposition to others where the tariff was competitive, as has been evidenced in Northern Ireland.

With the specification for 2nd generation meters expected to be finalised in 2014 and roll-out implementation expected from 2015, it would be possible to make a controlled market entry, prior to mass roll-out, and then to implement at scale once the new Company's capacity had been tested.

While there will be risks for both consumers and suppliers associated with the roll out of smart meters, it would appear that for an ESsCo focussed on the provision of affordable energy from renewable sources, the opportunities for both parties outweigh the downside risks. With effective risk management, both consumer and supplier stand to reap significant benefits in reduced costs and increased convenience. In addition, there are training, employment and investment opportunities for the RSLs in smart meters.

Payment methods

For many low-income customers, paying more for their electricity is a fact of life because they use prepayment meters (PPMs) or pay in small cash instalments. This allows them to control their expenditure on energy and avoid getting into debt, but at a price. Paying in this way usually means they have the highest tariff costs of all available tariffs, the inconvenience of having to leave their homes to 'top-up', pay more in transaction charges, and may self-disconnect when they are not able to 'top up'.

Energy costs are a critical factor in identifying fuel poverty, defined as households spending in excess of 10% of their income to maintain a satisfactory heating regime. UK Government policy since the late 1990s has been to tackle fuel poverty, although the fuel poor have been the least likely to benefit from any drop in fuel prices. Despite repeated government policy and energy supplier initiatives, those who can afford to pay least for their energy still pay the most.

Although generally low income customers do not tend to switch energy supplier, a small survey of RSL tenants undertaken for the feasibility study for this project indicated a high level of awareness of the option of switching and that a high proportion of tenants had done so. Both the literature review and the survey indicate a degree of consumer scepticism about energy suppliers in general, however, many of the tenants who took part in the survey tended to have a positive attitude towards their landlord and approved of the idea of their landlord becoming an energy supplier as long as this did not increase costs.

Financial structure

By structuring a new venture efficiently from the outset, advantages in respect of pricing, renewable energy and taxation can be captured. Additionally a key driver behind establishing a vertically integrated ESsCo is the ability to offer low-income consumers, immediately and in the long term, a fair and more affordable energy tariff. By controlling a supply company, this principle can be made central to the business model.

It is a requirement that a proportion of a supply company's electricity purchases be obtained from renewable sources, and if successfully developed, then projections indicate that vertically integrated renewable generation schemes offer the potential of positive returns, as well as security over future pricing. In addition, efficient tax planning offers a new ESsCo the opportunity to maximise its retained value.

A new company needs a suitable and efficient financing structure that meets both its short and long-term funding requirements. Key needs are for: start-up and growth finance; advanced energy purchases; working capital requirements; and in respect of renewable energy capital financing can be met by bank loan finance and equity.

Collaboration opportunities with other companies should be viewed positively, however this should be robustly tested against the new company's adopted founding principles and subsidiary objectives, which will act as the over-riding priority within the organisation.

Conclusion

Establishing a new ESsCo by the RSLs and RPE is an achievable goal and opens the opportunity to offer an affordable and supportive energy supply to firstly, the RSL consortium tenants and secondly to a wider audience of potential customers.

Setting up renewable generation schemes is also feasible for a new ESsCo and will offer positive financial and environmental impact opportunities.

Finally, having clear Founding Principles will produce an enabling structure for a new ESsCo to meet its future aims.

An ESsCo established in this way will provide clear benefits to RSL tenants and to the RSLs themselves through improving the disposable income of tenants and therefore making tenancies more sustainable.

Regulatory Requirements

Trust Housing Association

Chapter Summary

Overall Aim of workstream

This workstream examines the regulatory landscape for energy generation and supply. The objective is to outline the main regulatory regimes, creating a clear map of the landscape, such that it can inform the development of a feasible business strategy by understanding the associated risks and benefits.

Energy generation and supply is set within a precise regulatory framework. In order to ensure the viability of any vertically integrated supply company, based on a social enterprise model and focussing on low income consumers, we need to ascertain which regulatory requirements are relevant, how these can be met, areas of concern and potential risks and issues which arise which might in turn affect the overall model.

As fig 1 below describes, the regulatory landscape has – to some greater or lesser degree – an impact on all the workstreams examined in this suite of research. For this reason a detailed map of the regulatory framework is important to ensure a full assessment of the viability of the business model is possible and accurate.

Payment methods	There are regulatory provisions which apply to different payment methods, in particular how they impact on vulnerable consumers. In addition, the Consumer Credit Act licencing regime is relevant, depending on the methods of payment available.
Metering	As with payment methods, there are specific regulatory requirements relating to metering, especially in relation to vulnerable consumers which are relevant.
Electricity trading	The balancing and settlement system stems from regulatory requirements and the way in which the energy market is regulated a t a systems level. Compliance with the balancing and settlement system.
Renewable generation strategy	The regulatory framework and the impact of compliance capability and capacity will have an impact on both strategic business design questions and the value of partnerships with those who are able to provide solutions which minimise the regulatory burden and risk.
Legal framework	There are clear regulatory requirements around legal questions such as ownership and so on which would, in time, need to be addressed at a detailed level.
Financial structure	At its most basic level, the regulatory burden does have a financial cost. The exact nature of the cost is dependent on the precise business model adopted and the solutions available.

Fig 1 – summary of impact on other workstreams

It is not possible to map out every detail of the regulatory regime in a report this size, however this report does set out the key areas of relevance and provides a useful reference point. Specifically, this report focuses on setting out the main provisions relating to energy regulation. In addition this report also briefly addresses:

- the regulatory requirements of the Consumer Credit regime - providing details on applicability to this business model and an outline of the requirements.
- the regulatory framework related to Registered Social Landlords in Scotland with specific reference to energy – given the role of the RSL's this outline is of particular relevance to this business model.

1 Energy Regulation

Regulation of energy – Introduction

The UK electricity and gas industries have been open to competition for over 15 years. The style of deregulation adopted in the UK was to break up the functions of the entire utility supply chain into granular entities. The regulatory system which was developed specifically flows from this and needs to be understood from this perspective. This is best seen from the perspective of a 'supplier' company - the organisation which sends bills out to consumers and collects their payments.

At its most basic level the regulatory system ensures that the supplier must buy the energy which its customers will consume either directly from a generator or producer, or from other trading parties through a centrally-managed trading exchange. The supplier is not allowed to install or read meters directly - instead it must appoint and pay specialist companies who have been authorised by the industry regulator to carry out these tasks. The supplier must pay National Grid for the transmission of electricity and gas over the national networks, and also separately pays the companies which own and operate the local distribution networks. Depending on size, the supplier must participate in various consumer support initiatives, which aim to provide assistance to consumers who find it difficult to pay their utility bills.

The supplier must also keep track of the source of the proportion of electricity it sells which is generated from renewable sources, to ensure that it meets government targets and avoid penalties. The supplier is also mandated to remain compliant with a range of measures which protect the consumer, and must report regularly to the industry regulator and government departments.

In order to allow the industry participants to fulfil these obligations, a rich and complex set of data interactions (dataflows), were devised. Participants must pass stringent tests which exercise these dataflows to achieve qualification before entering the market, and detailed audit checks are carried out on all participants to ensure they remain compliant. There are a range of specialist providers who have devised packages which enable these data flows to be effectively managed, and meet regulatory reporting requirements.

As Figure 2 below describes the regulatory landscape has a degree of complexity, made up of a numerous layers, and subject to a range of influencing factors. The landscape is a combination of regulatory legislation, rules, licensing regimes and codes. In addition, although a privatised industry, energy remains a strategically important public policy area and as such suppliers can become vehicles for policy initiatives, such as energy efficiency measures and green energy. In of themselves these do not present an insurmountable obstacle. However the business model does need to address how these would be managed to minimise the costs of compliance, and how the strategic nature of the overall landscape is reflected in longer term business planning.

2 Operating in the energy industries

Overall regulatory framework

The energy gas and electricity industry is complex, with demanding regulation and codes. As well as competition as a driver of performance and customer satisfaction, suppliers are an important vehicle for government policy, for example in implementing energy efficiency measures and collecting subsidies for renewable energy generation to through their tariffs. Suppliers are also delivery agents for important technological changes, such as smart meters

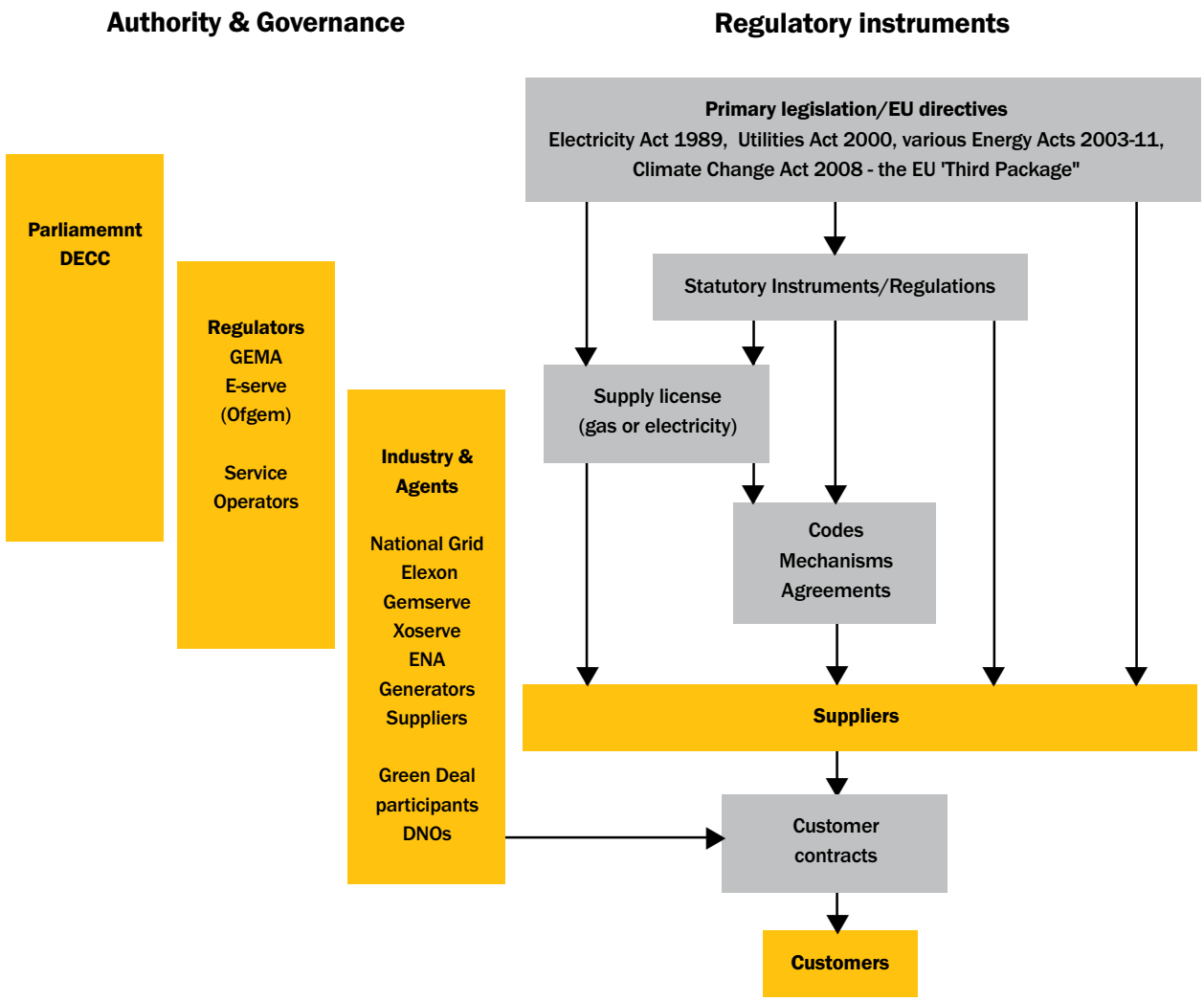

Figure 2 - Overview of regulatory framework for energy suppliers

The regulatory instruments

The diagram gives a broad overview of the regulatory instruments that bear on energy suppliers.

- **Primary legislation.** The key primary legislation is the Electricity Act 1989 and Gas Act 1985 as amended by subsequent acts of parliament. These laws are major implementations of policy. A new Energy Act is expected in 2013 to implement the Electricity Market Reform programme.
- **Secondary legislation**. This is detailed implementing legislation in the form of statutory instruments also referred to as regulations (or 'regs' as they are often known). These are made under authorities and mandates established in primary legislation. They are usually made by the government, though Ofgem, the regulator, has some powers to make regulations.
- **Supply licences**. The licences for electricity and gas are the key guiding documents for energy suppliers and represent the broad terms under which they must do business in the UK energy market. These licences are granted, managed and revoked by Ofgem, but means amending them rests with the government under powers established in primary energy legislation.
- **Codes, mechanisms and agreements**. These are detailed operational rules, procedures or standards that must be met by suppliers as part of their licence conditions. They are often derived from primary or secondary legislation and referred to in standard licence conditions. They are often produced by co-operative working between industry players. The practical operation of the systems, such as the Balancing and Settlement Code (BSC), is often out-sourced to a private sector firm (Elexon in the case of the BSC).

The regulator - Ofgem

There are several specialised regulators in the energy markets – including the Health & Safety Executive, Nuclear Decommissioning Authority, the Environment Agency and the Department of Energy & Climate Change itself. However, the most significant regulator for the downstream energy sector is Ofgem. The Ofgem structure is:

- **Ofgem**. The Office for Gas and Electricity Markets (Ofgem) is the most important regulator for energy suppliers and new entrants to any part of the customer-facing energy markets. Ofgem is an important source of guidance and advice. It consults widely on developments in the energy sector and provides authoritative documentation via its Electronic Public Register.
- **GEMA**. Ofgem is overseen by the Gas and Electricity Markets Authority (GEMA), in which its regulatory powers are ultimately vested. This functions like a board to Ofgem.
- **Ofgem E-serve**. Ofgem also has an important operational arm – Ofgem E-serve, which provides operational platforms for certain government policies – for example the Renewable and CHP Register, which keeps track of accreditations, entitlements and payments under the Renewable Obligation.

Nations of the United Kingdom

Great Britain. Most of the regulation that applies to suppliers is common to England, Wales and Scotland. The gas and electricity systems of Great Britain largely function as single integrated networks, with generators, transmission companies, distribution network operators and suppliers operating under common terms supervised by a single regulator. The main differences arise from devolved competencies: in particular the planning systems are different. There are some minor variations for generators operating in Scotland under the Scottish Renewables Obligation, but for the most part, the regulatory framework is the same. Many aspects of energy efficiency policy are devolved, and so there are different schemes in different nations of the UK, though schemes like the Green Deal and Energy Company Obligation are UK-wide.

Northern Ireland. Northern Ireland's energy system is integrated with that of the Republic of Ireland and they have common regulators and system operators – and completely distinct licences. Several UK schemes do apply in Northern Ireland, including the Renewables Obligation, Warm Homes Discount, but not programmes like the Green Deal or Energy Companies Obligation.

3 The Electricity and Gas supply licences

To supply electricity or gas to a customer in Britain, a supply licence is required in almost all circumstances, unless the energy is used on site. These licences set out the main conditions that the licensee has to meet as a commercial participant in the energy system and in their dealings with customers – including social and environmental obligations. They also put into effect provisions of primary legislation and statutory instruments, and refer to more detailed operational codes, mechanisms and agreements, which the licensee is required to comply with.

Regulatory basis

The main regulatory instruments are:

- Electricity Act 1989 Part 1[8]
- Gas Act 1986 (7A)[9]
- Utilities Act (2000)[10]
- Electricity Supply Standard Licence Conditions[11] - a set of standard terms maintained by Ofgem
- Gas Supply Standard Licence Conditions[12] - a set of standard terms maintained by Ofgem

8 Electricity Act 1989 c. 29 [link]
9 Gas Act 1986 c.44 [link]
10 Utilities Act 2000 c.27 [link]
11 Ofgem, Electricity Supply Standard Conditions – current version [link]
12 Ofgem, Gas Supply Standard Conditions – current version [link]

Description

The supply licences cover a range of provisions common to both electricity and gas supply and are set out using as far as possible common terminology and language. **Appendix A** sets out the main headings of the electricity and gas supply licences, as consolidated up to 28 January 2013. The licences have the following main purposes:

- To establish relations with the regulator and regulatory oversight – including payments and information requirements
- To bind suppliers to a series of industry codes that govern the technical and commercial arrangements for the gas and electricity industries and define the relationships between different actors
- To address emergency and security of supply objectives
- To ensure a fair and competitive market and to enable consumers to switch suppliers with relative ease
- To differentiate between domestic and non-domestic premises, and to provide some protections for micro-businesses
- To set rules for commercial practices in relation to billing, marketing, enquiries, complaints etc
- To meet social objectives for vulnerable customers – the elderly and people with long term health conditions
- To deal equitably with customers in debt or with difficulties paying their bills
- To upgrade metering technology over time and to support 'smart metering'
- To provide the regulatory basis for administration and payment arrangements of a number of government environmental or social schemes, including: the Green Deal, Feed in Tariffs, Warm Home Discount and Energy Companies Obligation
- To provide reduced obligations or voluntary participation for smaller suppliers – typically those with less than 250,000 customers

The supply licences do not govern every aspect of a suppliers' business – for example, electricity suppliers obligations under the Renewables Obligation apply directly through regulation.

Thresholds and concessions relevant to smaller suppliers

The following thresholds and concessions are relevant to smaller suppliers:

- **Financial reporting**. Suppliers with fewer than 250,000 customers have reduced financial reporting requirements (SLC19).
- **Payment mechanisms.** Suppliers with fewer than 50,000 customers are not obliged to offer a wide range of payment methods – cash, fortnightly, prepayments etc (SLC 27). This allows for direct-debit or electronic billing only, offering potential competitive advantage, but limiting the potential customer base.
- **Warms Homes Discount**. Suppliers with fewer than 250,000 customers are not obliged to participate, but may opt in as voluntary
- **Feed in Tariff (FiT) Licensees.** Suppliers with fewer than 250,000 customers are

not obliged to be mandatory FiT licensees (SLC33 – increased from 50,000 in August 2102) but may opt to become Voluntary FiT Licensees. Licensed Electricity Suppliers cannot offer FiT services unless they are confirmed to be a FiT Licensee, however they are obligated to participate in the 'levelisation' process (ie they have to contribute to the costs in proportion to their market share).

- **Green Deal licensees.** Suppliers with fewer than 250,000 customers are not obliged to be mandatory Green Deal licensees. It is possible to be a voluntary Green Deal Licensee, but this option has not so far been taken up by any smaller supplier (March 2013). Note that customers would have to switch to a participating supplier to participate in the Green Deal.
- **Energy Companies Obligation (ECO).** Energy suppliers with fewer than 250,000 customers are not required to participate in the ECO. To minimise the impact on smaller suppliers who pass through the 250,000 customer account threshold the size of an ECO will be tapered such that the size of the obligation on smaller companies increases gradually.
- **Smart metering.** Suppliers with fewer than 250,000 customers (referred to as 'small domestic suppliers' in the licensing terms) have some reduced obligations, for example do not have to contribute start-up costs for the new consumer engagement body.

4 Applying for a licence

Ofgem assesses licence applications a primary focus on protecting the interest of current and future customers. Its licensing process does not assess business plans or in any way endorse a supplier for customer marketing purposes.

Regulatory basis

The process of application for a supply licence is itself governed by regulations and guidance

- The Electricity (Applications for Licences, Modification of an Area and Extensions and Restrictions of Licences) Regulations 2010[13]
- The Gas (Applications for Licences, Modification of an Area and Extensions and Restrictions of Licences) Regulations 2010[14]
- Guidance for gas and electricity supply applications[15]

Description

Ofgem takes a three-tiered risk-based approach to assessing licensees' suitability, in particular looking at its capability to discharge its obligations and meet its financial commitments under the licences. It aims to verify that the potential licensee is able to:

- finance their legal obligations;

13 SI 2010/2154 (PDF)
14 SI 2010/2155 (PDF)
15 Ofgem, Guidance for gas and electricity licence applications [link]

- meet all reasonable demands for gas and electricity;
- contribute to the achievement of sustainable development;
- have regard to the interests of particular customer groups, such as those with a disability, or those who are chronically sick.

As stated, the granting of a licence does not amount to an endorsement of a business plan, or validation that the applicant is a 'fit and proper' person.

Engagement with industry code bodies. A significant part of the application process is demonstrating engagement with the industry code parties, and therefore readiness to participate in the technical and commercial arrangements for the industry. An applicant that cannot provide evidence of substantive contact with relevant code parties with a view to meeting this requirement as soon as possible after a licence is granted is more likely to receive a higher risk rating than an applicant that provides details of contact with relevant industry parties that clearly illustrates an intention to become a signatory/party to relevant industry codes and agreements.

5 Industry codes

At the heart of the energy supply licences is the requirement to comply with a series of industry codes that govern in detail the technical and administrative operation of the electricity and gas systems.

Regulatory basis

Standard electricity licence conditions SLC11.1 and 11.2 require compliance with a list of six codes. The standard gas supply licence is more straightforward as most of the technical burdens are assumed by the gas shippers (gas wholesalers that sell to suppliers) and transporters (pipeline operators).

Description

There are six electricity codes identified in the standard electricity supplier licence and two relevant codes referenced in the gas supplier licence.

Electricity: The Distribution Code

This code[16] governs the technical parameters and other considerations concerning connection to and use of distribution networks. The code specifies day-to-day procedures that govern the relationship between the distribution licensee and a supplier for planning and operational purposes both in normal and emergency circumstances. The code is maintained jointly by the distribution network operators to a common format throughout Britain. (189 pages)

Electricity: The Grid Code

This code[17] governs all material technical aspects of connection to and the operation

16 Energy Networks Association, The Distribution Code of Licensed Distribution Operators of Great Britain [link]
17 National Grid Electricity Transmission plc, The Grid Code [link]

and use of the transmission system. The Grid Code also specifies data which system users are obliged to provide to National Grid for use in the planning and operation of the transmission system, including demand forecasts and availability of generating capacity. Most of this code does not bear on a small domestically focussed electricity supplier, but there are some obligations that must be complied with. (600 pages)

Electricity: The Master Registration Agreement

This agreement (the MRA)[18] is an agreement that sets out terms for the administration of metering points – effectively the database of electricity customers. Its function is to manage the processes established between electricity suppliers and distribution companies to enable electricity suppliers to transfer customers in the competitive supply market. (290 pages)

Electricity: The Distribution Connection and Use of System Agreement

This agreement[19] (DCUSA) is multi-party contract between the British licensed electricity distributors, suppliers and generators governing the use of the electricity distribution systems to transport electricity to or from connections to them. (376 pages)

Electricity: The Connection and Use of System Code

This code (the CUSC)[20] constitutes the contractual framework for connection to and use of National Grid's high voltage transmission system and should be considered alongside the Grid Code. The code governs the payment regime for transmission system services used by electricity suppliers, notably Balancing Services Use of System charges (BSUSoS) and Transmission Services Use of System charges (TNUoS). A new supplier has to go through a CUSC Accession application to subscribe to this code. (1364 pages)

Electricity: The Balancing and Settlement Code

This code (the BSC)21 establishes the contractual framework that enables the system operator (National Grid) to balance supply and demand at half-hourly intervals throughout the day. The energy balancing function allows parties to either buy or sell electricity into/out of the market at close to real time in order to keep the system from moving too far out of phase. The settlement aspect relates to monitoring and metering the actual positions of generators and suppliers against their contracted positions and settling imbalances when actual delivery or off-take does not match contractual positions. (864 pages). This legal code is supported by a set of BSC Simple Guides[22].

Gas: The Network Code and Uniform Network Code

The Network code is an agreement between transporters and shippers. A Network Code is specific to each gas transporter (SLC 9 of the gas transporter licence), and the Uniform Network Code (UNC)[23] sets out terms common to all transporters and agreed between them. The Network Codes provide the legal and contractual framework for the supply and transport gas. The UNC has a common set of rules for

18 Master Registration Agreement Services Company / Gemserv, The Master Registration Agreement [link]
19 DCUSA Ltd Distribution Connection and Use of System Agreement [link]
20 National Grid Electricity Transmission plc The Connection and Use of System Code. [link]
21 Elexon Ltd. The Balancing and Settlement Code [link]
22 Elexon Ltd BSC Simple Guides [link]
23 Joint Office of Gas Transporters, Uniform Network Code [link]
24 (1) [General provisions] (2) [Transportation principal document] (3)[Offtake arrangements]

all industry participants, which aim to establish a fair and competitive market place. It governs processes, such as the balancing of the gas system, network planning, and the allocation of network capacity. It comprises three main parts (or 'binders'): (1) General provisions; (2) Transportation principal document; (3) Offtake arrangements document.[24]

Gas: The Supply Point Administration Agreement

The Supply Point Administration Agreement (SPAA)[25] sets out the inter-operational arrangements between gas suppliers and transporters in the UK retail market. It is a multi-party agreement to which all domestic gas suppliers and all gas transporters are required by their Licences to accede – SLC 30 for suppliers. (79 page framework, with 33 schedules).

6 Competition and customer switching

The energy supply market is intended to be competitive. This means that regulations are less prescriptive than they have been in the past regarding customers service levels, discrimination between customers and tariffs etc. However, for competition to work, it is necessary to lower barriers to switching suppliers. Suppliers therefore have obligations to facilitate switching.

Regulatory basis

- Broadly, the regulator (Gas and Electricity Markets Authority / Ofgem) interprets its responsibility to protect the interest of consumers as aligned with promoting competition.
- Standard Licence Condition 14 and 14A of the supply licences set out the situations when it is acceptable to block transfer of customers to a new supplier, and create the general duty to facilitate switching.
- Standard Licence Condition 25B of the supply licences ensures that smart meters do not create a barrier to switching.

Description

SLC 14 creates a general presumption against blocking switching by defining the only circumstances in which it is permitted – primarily where there are substantial debts (now >£500 for each fuel) or where there have been errors. SLC14A places an obligation on suppliers to facilitate switching within 21 days, to improve the ease of switching. Smart meters could potentially be a source of customer capture by suppliers if they use proprietary standards. See SLC 25B meter inter-operability – more detailed guidance is available[26].

24 (1) [General provisions] (2) [Transportation principal document] (3)[Offtake arrangements]
25 SPAA Ltd / Electralink Ltd Supply Point Administration Agreement (SPAA) [link]
26 Ofgem, Supporting effective switching for domestic customers with smart meters: Modification of supply licence standard conditions [link].

7 Metering and smart meters

Metering is a core function of the supply business. By 31 December 2019, almost all domestic and non-domestic metered premises should have a 'smart meter' installed for gas and for electricity. The costs are to be carried by suppliers and socialised into the tariffs (i.e. carried by all consumers). The installation programme should begin in earnest from April 2014. The supply licences have been substantially modified to create the basis for smart meters.

Regulatory basis

The introduction of smart meters involves extensive modification of the standard licenses[27]. The following licence terms will apply to metering and smart metering, with further to be added in future – for example to incorporate the Smart Energy Code when it is complete.

Elec	Gas	Standard Licence Condition
12	12	Matters relating to electricity / gas meters
25B	25B	Interoperability of Advanced Domestic Meters
39	33	Smart Metering System – Roll-out, Installation and Maintenance
40	34	Provision of an In-Home Display
41	35	Smart Metering Installation and Installation Code of Practice – Domestic Customers
42	36	Smart Metering Installation and Installation Code of Practice – Micro Business Consumers **New Standard Licence Conditions (come into effect 4 March and 30 June 2013)**
43	37	Roll-out Reporting and Provision of Information to the Secretary of State
44	38	Roll-out Reporting, Setting and Achieving Annual Milestones, and Provision of Information to the Authority
45	39	Smart Metering Consumer Engagement
46	40	Security controls in relation to Smart Metering Systems
47	41	Smart Metering – Matters Relating To Obtaining and Using Consumption Data

27 Modifications to the standard conditions of electricity and gas supply licences, distribution licences, transmission licences (smart meters) [link]

Description

Overview

Smart meters represent a significant development in the electricity and gas supply business. Meters can be read remotely and real-time consumption and cost information can be provided to the consumer or, in some circumstances, to other suppliers. They open up the potential for much more sophisticated tariffs, behavioural incentives and, potentially, automated demand-side management and exploitation of storage technologies in electric vehicles. The technology requires a telecommunications system, including a link from the meter to the supplier and also a wifi signal within the home to connect to customer displays and, potentially, to switches that manage demand in the home. The introduction of greater intelligence and communications into the supply business will inevitably raise issues related to privacy, data security and data sharing.

Data Communication Company. Communications between smart meters in domestic consumers' homes and authorised smart meter data users will be coordinated by a new, countrywide data and communications body. This new central body will have a key role in both data and communications services and is referred to as Data Communications Company (DCC).

Consumer engagement body. Suppliers will be required jointly to establish and fund a consumer engagement body, to promote the programme and build awareness of how to use smart meters. Small suppliers will not have to bear the initial capital costs.

Smart Energy Code

There will be a new industry code, spanning gas and electricity supply, to provide arrangements for the introduction and ongoing operation of the end-to-end smart metering system. Among other things, the Code will detail the relationships between the DCC and the users of its services as well as between users. Energy suppliers, network operators and other users of the DCC's services will be required to comply with the Code. The Code is under development[28].

Smart Metering Installation Code of Practice

The Smart Metering Installation Code of Practice (SMICOP)[29] sets out rules and standards of conduct for suppliers installing smart metering systems for domestic and micro-business customers. The SMICOP's content principally reflects supply licence conditions made by the Department of Energy and Climate Change (DECC) which took effect on 30 November 2012. These licence conditions are designed to ensure that consumers have a positive experience of the smart metering installation process.

Smart metering equipment technical specifications

It will be necessary to have a standard that qualifying meters must meet. The licences require the supplier to take all reasonable steps to install smart metering equipment which meets the requirements of the smart metering equipment technical specifications (SMETS), currently under development[30].

Small domestic suppliers

The basic duties to meet new metering standards by the end of 2019 apply to all suppliers. However, the new licence terms provide several exemptions and reliefs for small domestic suppliers, defined as those with fewer than 250,000 customers.

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28 DECC, Smart Energy Code stage 1: draft legal text (consultation) [link]
29 Ofgem, Consultation on the Smart Metering Installation Code of Practice (with draft code version 1.0) [link]
30 DECC, Smart metering equipment technical specifications: second version [link]

8 Customer relations

Relations with customers are closely regulated and a contract with the customer is required to implement the relevant legislation and licence conditions as they apply to consumers. This can be an actual contract or a 'deemed contract' (a contract that applies by virtue of supplying and using electricity or gas, even if no formal agreement has been signed).

Regulatory basis

- The Electricity Code: Schedule 6 of the Electricity Act 1989 (as amended)[31]
- The Gas Code: Schedule 2B of the Gas Act 1986 (as added and amended)[32]
- Standard Licence Condition 7 of the supply licences provides the basis for contracts and deemed contracts
- Standard Licence Condition 25 of the supply licences regulates marketing practices
- Standard Licence Condition 32 of the supply licence provides the basis for Ofgem and Consumer Focus to be provided with data on consumers.

Description

Standard contracts

The contractual relations with customers have two main elements:

- The contract between the supplier and customer. This details what the respective rights and obligations of the parties. The main suppliers have their contracts available on line.
- The contract between the distribution network operator and the customer. The electricity supplier acts as the agent of the electricity network operator to obtain a connection agreement with the customer on a standard contract known as the National Terms of Connection[33]. When the customer enters an electricity supply contract they are also entering into a connection agreement with the electricity network operator.

Appendix B sets out the headings of the terms offered by npower. This gives an illustration of the matters that should be covered – many with a regulatory basis.

Marketing to domestic consumers

SLC 25 ensures information provided to domestic consumers is fair, not misleading and presented in an accessible way with appropriate prominence given to key information. It also aims to ensure that relations with consumers conducted in a fair, transparent, appropriate and professional manner.

31 Electricity Act 1989 c.29 schedule 6 [link]
32 Gas Act 1986 c.44 schedule 2B [link]
33 Energy Networks Association: National Terms of Connection www.connectionterms.org.uk

Information requirements

Suppliers have to provide information to the regulator and consumer protection agency (Consumer Focus) as reasonably required. Particular emphasis is placed on the following data (SLC 32.2):

> *(a) the number of the licensee's Domestic Customers using each method of payment for Charges for the Supply of Gas / Electricity;*
> *(b) failures by the licensee's Domestic Customers to pay Charges for the Supply of Gas / Electricity by the date on which the payment was due;*
> *(c) Disconnections carried out by the licensee;*
> *(d) the provision by the licensee of gas safety checks and energy efficiency information; and*
> *(e) the services offered by the licensee to Domestic Customers on its Priority Services Register and the number of Domestic Customers who are listed on that register.*

9 Vulnerable customer obligations

Energy suppliers take on a number of responsibilities regarding their dealings with 'vulnerable customers', including elderly, disabled, people with long term illnesses and people struggling to pay their bills or who have accumulated debt.

Regulatory basis

- Standard Licence Condition 26 ('Services for specific Domestic Customer groups') sets out obligations to defined disadvantaged groups and to manage their services via a 'priority services register'
- Standard Licence condition 29 of the gas supply licence requires regular gas safety checks for certain vulnerable groups.

Description

Services for vulnerable consumers – Priority Services Register

Relevant customers. Energy suppliers are obliged (SLC 26) to offer a range of free services to their most vulnerable customers, who they must record on a 'priority services register' (SLC26.4) if requested. The scheme is available to all household gas and electricity consumers who are any of the following:

- of pensionable age
- have a disability
- have a hearing and/or visual impairment
- *have long-term ill-health*

Service to be offered. (SLC26.1-3) Customers who are of Pensionable Age, disabled or chronically sick:

- *agree a password to assist with secure contact with the licensee*
- *send bills to nominated alternative person, such as a carer*
- *arrange quarterly meter reading if the priority customer is unable to do it*
- *ensure that any pre-payment meter is easily accessible*
- *enable blind, partially sighted, deaf or hearing-impaired customers provide accessible information or to complain about bills or statements, and any other service provided by the supplier*

Gas safety check. (Gas SLC29) There is a further requirement for gas suppliers to provide free gas safety checks to customers to a range of customers who may be at risk.

Monitoring & reporting

Standard Licence Condition 32 requires gas and electricity suppliers to provide information to Ofgem relevant to their dealings with domestic customers

- Social Obligations Monitoring. Suppliers submit quarterly data to Ofgem on various topics including debt levels, disconnection rates and payment methods used by customers.
- Other monitoring and reporting. In addition to the Social Obligations monitoring, suppliers report annually to Ofgem/DECC on their social initiatives and offerings for customers.
- Prepayment Meter Regulations Monitoring. The Prepayment Meter Regulations require data to be gathered and reported on pre-payment meter use.
- Ad hoc reporting. Ad hoc monitoring and reporting on specific issues takes place, as required, for example our current monitoring of suppliers' actions to recalibrate token prepayment meters and avoid the build up of debt for customers.

10 Customers in debt or struggling to pay

At the end of 2011, around 700,000 gas consumers and 785,000 electricity consumers were repaying an energy debt through an agreed debt repayment arrangement, with an average debt of the order of £350-400. This accounts for around 3% of the total number of electricity and gas consumers in Britain.

Regulatory basis

These regulations are statutory instruments governing the agreements between suppliers and customers for the recovery of debt through prepayment meters.

- Standard Licensing Conditions 27 for gas and electricity supply licences -Payments, Security Deposits, Disconnections and final Bills
- Standard Licensing Conditions 28 for gas and electricity supply licences – Prepayment meters

- Electricity (Prepayment Meter) Regulations 2006[34]
- Gas (Prepayment Meter) Regulations 2006[35]

Description

Responsibilities to help customers pay their bills

Under the electricity and gas supply licence conditions, suppliers are obliged to offer domestic consumers struggling to pay their electricity and/or gas bill the following payment options: payment by direct deductions from social security (known as Fuel Direct – through DWP's Third Party Deductions (TPD) scheme[36]); payment through a prepayment meter (PPM) where safe and reasonably practicable to do so; payment by regular instalments paid through means other than a PPM.

Suppliers are also required to take into account the consumer's ability to pay when calculating repayment instalments and setting repayment terms so that repayments are manageable for consumers on all payment types and circumstances, even where this involves repaying the debt over a longer period of time.

Disconnection

The supply licences (SLC 27.9-11B) address the circumstances in which it is acceptable and unacceptable to cut the supply to customers. The broad principle is that is acceptable only when efforts to secure repayment, for example through a prepayment meter, have been exhausted. Where there are elderly or vulnerable people in the property there are restrictions on disconnections and additional responsibilities to maintain supply.

Prepayment meters

Standard Licence Condition 28 requires the supplier to secure informed consent and the safe and practicable operation of a prepayment meter. The Prepayment Meter Regulations authorise a supplier to collect debt through prepayment meters and regulate the way this is done.

Debt assignment protocol

The Debt Assignment Protocol, as outlined under Standard Licence Condition (SLC) 14.5 and 14.6 is designed to allow customers in debt (up to £500) to benefit from switching suppliers – transferring their debt to the new supplier[37].

Vulnerable customers – best practice

Though not strictly a regulation, there are standards for best practice management for vulnerable customers that a social enterprise may aspire to achieve.

34 SI 2006/2010
35 SI 2006/2011
36 Department for Work and Pensions, Third Party Payments: Creditor Handbook [link]
37 Debt Assignment Protocol

Consumer Focus: best practice

Examples of best practice which Consumer Focus would like to see all suppliers adopt:

- Monitoring irregular PPM payments/top-ups to identify households at risk of self-disconnection, offering extra help as appropriate
- Contacting any customer who is off supply for an extended period of time – making a home visit where necessary
- Using a checklist and flagging system, as a minimum, to identify and support vulnerable customers
- Rolling-out specific on-going staff training on how to check an individual's circumstances, ability to pay, and whether they need additional support as a vulnerable consumer
- Identifying through regular checks whether PPM customers' circumstances have changed and whether the PPM is still appropriate and suitably accessible
- Providing remote top-up facilities to help customers in emergencies

11 Fuel poverty - Warm Homes Discount Scheme

The Warm Home Discount (WHD) scheme came into operation on 1 April 2011 and extends to 2015. The scheme mandates domestic energy suppliers to provide approximately £1.13 billion of direct and indirect support arrangements to fuel poor customers over four years.

Regulatory basis

The key regulatory provisions and relevant guidance are:

- The Warm Home Discount Regulations (2011)[38]
- The Warm Home Discount (Reconciliation) Regulations (2011)[39]
- Warm Home Discount: Guidance for Licensed Electricity Suppliers and Licensed Gas Suppliers[40]

Description

Customer focus and eligibility

Under the WHD scheme, the supplier provides discounts to target groups likely to be at risk from effects of fuel poverty. It has replaced a voluntary agreement between suppliers and Government which ran between April 2008 and March 2011.

38 SI 2011/1033
39 SI 2011/1414
40 Warm Home Discount: Guidance for Licensed Electricity Suppliers and Licensed Gas Suppliers [link]

The scheme is redistributive – costs must be met from revenue raised from other customers: there is no payment from the government – however this cost is met from within the industry so that no supplier (or suppliers) is put at a competitive disadvantage due to having a disproportionate number of customers that are eligible for a Core group rebate (see below). The scheme is divided into four different elements: the Core Group, the Broader Group, Legacy Spend and Industry Initiatives.

- **Core Group:** Support under this category is due to be targeted at older poorer pensioner households. Those vulnerable customers matched by this process will receive an automatic annual rebate of at least £120, rising to £140 by the end of the scheme. This part of the scheme is coordinated by DECC.
- **Broader Group:** In addition to the Core Group, suppliers will be required to provide an annual rebate to a wider group of customers who are fuel poor or in a group at risk of fuel poverty. Eligibility for these customers will be set by suppliers themselves based on the framework set by the WHD Regulations. Each participating supplier will issue information on which customers could potentially benefit from this part of the scheme in the coming months.
- **Legacy Spend:** Under the scheme, suppliers have the option to continue to offer discounted/social tariffs or rebates to the types of vulnerable customers who have benefited from these under the Voluntary Agreement.
- **Industry Initiatives:** Suppliers can also choose to provide support through Industry Initiatives. Again each participating supplier will provide more information on this part of the scheme in the coming months.

Role of energy suppliers

The scheme is compulsory for energy suppliers with over 250,000 customers. It is optional for those with fewer than 250,000 – they can become 'voluntary scheme suppliers', and only need to participate in the Core group. 'White label' suppliers participate if the primary supplier is a compulsory participant. The costs are carried by suppliers and socialised through tariffs. Costs are paid in proportion to market share and there is a reconciliation mechanism to ensure that no supplier (or suppliers) is put at a competitive disadvantage due to having a disproportionate number of customers that are eligible for a Core group rebate.

12 Renewables obligation

The Renewables Obligation (RO) is the primary mechanism for support of large scale renewable electricity (>5MW DNC) in the UK. The essence of the system is an obligation on all electricity suppliers to source a certain quantity renewable electricity. The amount rises each year. The costs of meeting this obligation are incorporated into each supplier's cost base and so passed on to consumers. The mechanism ensures costs are spread evenly and allows suppliers to 'buy-out' their obligation if they have not generated or purchased renewable energy, by purchasing certificates from renewables generators.

Regulatory basis

The Renewables Obligation is delivered by a range of statutory instruments. The critical legislation comprises the 2009 Renewables Obligation Orders (as amended) for England and Wales, for Scotland, and for Northern Ireland[41]. There are substantial amendments in 2013 to allow for technology banding[42] (ie. different level of support per MWh for different technologies).

Guidance

- (Draft) Renewables Obligation: Guidance for licensed electricity suppliers[43]
- (Draft) Renewables Obligation: Guidance for generators[44]
- Renewables Obligation Annual Report 2011-12 (latest version)[45]

Description

Overview

Each electricity supplier is required to source a proportion of their total electricity supplied from eligible renewables generation (their obligation) or to pay a 'buy out price' for each MWh of their obligation not sourced from renewables. Ofgem issues Renewables Obligation Certificates (ROCs) to renewables generators to reward eligible renewables generation. Suppliers must meet their obligations by buying these ROCs and presenting them to Ofgem, or by paying the buy-out price. In the earlier years of the RO, ROCs were typically awarded at a rate of 1 ROC for 1 MWh of eligible renewable generation and the obligations were specified in MWh, however 'banding' is now extensively used to provide a variable rate of ROCs per MWh according to the technology and to vary over time to drive efficiency gains and reflect the different stages of development of different technologies. The suppliers' obligations are now expressed in ROCs, and for 2013-14 the obligation is 20.6 ROCs per 100 MWh. Strictly speaking, the obligation and market for renewables is denominated in ROCs,

41 Renewables Obligations Order (2009) SI 2009/785 ; (Scotland) SSI 2009/140; (Northern Ireland) NISR 2009/154 Consolidated version E&W with 2010 & 2011 amendments [link]
42 Renewables Obligation Order (Amendment) 2013 [link]
43 Ofgem,(Draft) Renewables Obligation: Guidance for licensed electricity suppliers [link]. Note incorporates changes to be introduced in 2013-14, but is a consultative document.
44 Ofgem,(Draft) Renewables Obligation: Guidance for generators [link]. Note incorporates changes to be introduced in 2013-14, but is a consultative document.
45 Ofgem, Renewables Obligation Annual Report 2011-12 [link]

not in quantity of renewable electricity.

Setting the obligation

The obligation on suppliers is set annually six months in advance of the obligation period (ie before 1 October). The obligation is based on the greater of two quantities: (1) the fixed amounts set in the 2009 Order for each year (eg. 13.4 ROC per 100 MWh in 2013-14) or (2) the estimated likely renewable generation plus a 10 percent 'headroom' estimate. The latter quantity equated to 20.6 ROCs per 100 MWh in 2013-14, and this became the obligation for 2013-14[46]. The idea of this is to ensure some scarcity in the ROC market so that ROC prices do not fall to zero and pressure is maintained to build greater renewables capacity.

Buy out and late payments

Where a supplier cannot or chooses not to present ROCs to meet their obligation, they must pay a buy-out price for each ROC not presented – this will be £42.02/ROC in 2013-14. This creates a buy-out fund, which is then used to pay the administration costs of the scheme, with the remainder redistributed to suppliers in proportion to the share of ROCs they presented. The effect is to cap the cost of ROCs – a kind of economic safety valve. Suppliers can meet their obligations by holding ROCs, by buy-out or by a combination. Suppliers are charged if they make late payments and these charges are added to the buy-out fund. The combined value of the recycled buy-out and late payments fund in 2011-12 was £3.58/ROC.

Operational matters

Each obligation period runs from 1 April to 31 March. Ofgem provides the administrative platform for the RO through its E-serve business. Each supplier must have an account on the Renewables and CHP Register[47] and submit data and payments to a timetable set out by Ofgem[48]. The register is used to keep track of ROCs issued to generators and redeemed by suppliers. Suppliers must provide data to Ofgem on their annual supply during the preceding obligation period by 1 June, and meet their obligation by presenting ROCs or making buy-out payments and submitting a compliance report by 1 September.

Nations of the UK

There are three RO systems in operation: for England & Wales; for Scotland; and for Northern Ireland. The obligation on suppliers is common across England & Wales and Scotland, though there are differences in how many Scottish ROCs (SROCs) are awarded per MWh of renewable generation. From the suppliers' perspective the SROC and ROC are equivalent. Suppliers in Northern Ireland have a separate (lower) obligation, and can meet their obligations from ROCs sourced elsewhere in the UK.

The future

The RO will close for new entrant generators after 2016-17. However, installed capacity at that date will still be credited with ROCs for the 20-year life of each project and obligations under the RO will be placed on suppliers until 2027, with DECC assuming responsibility for fixed price payments (set at £41/ROC at current prices) from 2027 to 2037. From April 2017, the support regime for new renewables will be

46 DECC, Calculating the Level of the Renewables Obligation for 2013/14 [link]
47 Ofgem, Renewables and CHP Register [link]. Register User Guide [link]
48 Ofgem,(Draft) Renewables Obligation: Guidance for licensed electricity suppliers [link]. Appendix 2.

the Feed in Tariff / Contract for Difference (FIT/CFD) currently under development in DECC's Electricity Market Reform programme.

Generation under the Renewables Obligation

It is possible to be a supplier, a generator, or both as a participant in the RO. The same Renewables Obligation Orders and administrative arrangements include both. Ofgem produces guidance to generators[49]. Key concerns for a generator include:

- Planning, construction, licensing and grid connection of the generating station – these issues fall outside the regulatory framework of the RO.
- The ROCs received per MWh generated and banding arrangements
- Accreditation – the process by which Ofgem confirms that the generating station is eligible to receive ROCs and conditions attached to participating in the RO
- Metering and data provision with the Renewables and CHP Register
- Trading of ROCs with suppliers and other off-takers – a commercial transaction
- Grandfathering – the policy intent to maintain support at the levels provided at the point of accreditation – ie. existing generation is not affected by future changes in the banding arrangements.
- Own use and export to a third party – renewables generated and used on site or exported to third party via a private wire can still receive ROCs.

13 Feed in Tariff

The Feed In Tariff (FiT) regime is designed to allow an organisation, business, community or individual to install a small-scale low-carbon electricity generation system (solar photovoltaic (PV), wind, hydro, micro-CHP or anaerobic digestion) and to receive premium payments for the electricity used and any surplus exported to the grid. The FIT provides support for installations up to 5MW. For larger schemes (>50MW) this support is partly integrated with the Renewables Obligation, which provides the support framework for renewables installations greater than 5MW.

Regulatory basis

There are two key regulatory provisions and related guidance:

- Conditions 33 and 34 of the Electricity Supply Licence
- Feed-in Tariffs Order 2012 ("the FIT Order")[50]
- Feed-in Tariff: Draft Guidance for Licensed Electricity Suppliers (Version 5) December 2012[51]

49 Ofgem,(Draft) Renewables Obligation: Guidance for generators [link].
50 SI 2012/2782
51 Ofgem, Feed-in Tariff: Draft Guidance for Licensed Electricity Suppliers (Version 5) December 2012 [link]

- Feed-in Tariffs Scheme: Guidance for renewable installations[52]

Description

Applying for a FIT

Under the FIT regime, a generator applies to the licensed FIT supplier or to Ofgem with proof that the scheme has been built from approved products, using an improved installer. The licensed supplier will then collect information from the meter and pay a fixed amount for the electricity generated (the feed in tariff) and a different (lower) price for any surplus exported to the grid (the export tariff). The costs are met from suppliers' revenues, so represent transfers from non-participating to participating consumers. To ensure the costs fall fairly on each supplier and their customers a 'levelisation' mechanism is used to ensure each supplier pays according to market share, not the amount of installed FIT generation they are servicing.

All FIT schemes are registered through the Central FIT Register, which keeps track of installation dates, eligibility, accreditation etc[53]. The FIT like the Renewables Obligation and other renewable schemes administered by Ofgem utilises the Renewables and CHP Register as a common platform to provide access and other functions to support CFR operation. Different rules apply for schemes above and below 50kW.

- **Application via a Licensed FIT supplier**. Installations of 50kW or less (excluding anaerobic digestion and hydro) are required to obtain the Microgeneration Certification Scheme (MCS) certification or equivalent (see below) guaranteeing that the product is commissioned by a MCS-certified installer using a MCS-certified product. The supplier registers the user on the Central FIT register.
- **Application directly through the ROO-FIT interface**. Installations greater than 50kW and up to and including 5MW (or all anaerobic digestion and hydro up to 5MW) need to apply for Renewables Obligation Order – Feed in Tariff (ROO-FIT) accreditation from Ofgem. This is similar to the process of accessing the Renewables and CHP Register. Microgeneration Certification Scheme. The MCS54 is a quality assurance scheme that approves products and installers, and it is a requirement for eligibility for the FIT and Renewable Heat Incentive for 50kW or less (electricity).

Microgeneration Certification Scheme. The MCS[54] is a quality assurance scheme that approves products and installers, and it is a requirement for eligibility for the FIT and Renewable Heat Incentive for 50kW or less (electricity).

Tariffs. The definitive tariff information is held by Ofgem[55] – the tariff structure has become complicated and varies according to:

- Technology type
- Scale of installation in kW
- Eligibility date (there are 'degression' mechanisms designed to reduce the tariffs over time)

52 Ofgem Feed-in Tariffs Scheme: Guidance for renewable installations (Version 5) December 2012 [link]
53 Feed-in Tariff: Central FIT Register User Guide- March 2013 [link]
54 Microgeneration Certification Scheme: www.microgenerationcertification.org
55 Ofgem, Feed in Tariff scheme: tariff tables [link]

- Inflation – the tariffs are adjusted for RPI inflation each year
- Whether used in the building or exported to the grid
- For solar PV:
  - whether the property has an energy performance certificate at level D or better;
  - whether attached to a building or stand alone
  - whether a single or multiple installation

Community energy schemes and schools

The FIT is designed to appeal to community groups and schools that wish to develop renewables locally. There are additional beneficial terms available to community and schools groups wishing to take a FIT – the energy efficiency requirement (Energy Performance Certificate of D or better) is relaxed in some circumstances, which enables less energy efficient buildings to be eligible for higher the higher tariffs for PV. There is also a 'tariff guarantee' arrangement protects the applicant from tariff reductions during the application process. Ofgem has produced (draft) guidance for community groups and schools[56].

Role of electricity suppliers

Ofgem provides guidance for suppliers on their roles and responsibilities with respect to the Feed In Tariff[57]. The main heading of the contents below give an idea of the coverage.

Contents

56 Feed-in Tariff: Draft Guidance for Community Energy and School Installations (Version 1) [link]
57 Feed-in Tariff: Draft Guidance for Licensed Electricity Suppliers (Version 5) December 2012 – and other guidance[link]

Appendices
Appendix 1 – Metering regulations
Appendix 2 – Generator and installation details required for CFR
Appendix 3 – Statement of FIT terms
Appendix 4 – Glossary
Appendix 5 – Solar PV declarations (new installations and extensions)
Appendix 6 – Solar PV declaration (change to the FIT Generator or Nominated recipient)
Appendix 7 – Degression

Suppliers with more than 250,000 customers are mandatory FIT licensed suppliers and others can opt-in to become Voluntary FIT Licensees. However, all suppliers have to bear the costs and participate in the levelisation process.

Small suppliers

There is no requirement to become a licensed FIT supplier for suppliers with fewer than 250,000 customers, though they can opt in. The customer does not have to use the same supplier for their FIT contract as they use for supplying their mains electricity.

Levelisation

All licensed electricity suppliers (regardless of FIT participation status) are required to make payments into Ofgem E-Serve's levelisation fund, based on their market share of the Great Britain electricity supply market and any FIT payments made to accredited installations under the FIT scheme. The fund is then redistributed to FIT licensees that have made more payments to accredited installations than they would be required to by their market share contribution. Currently this process occurs on a quarterly basis.

Central FIT Register

Licensed FIT Suppliers must enter customers with installations below 50kW on the Central FIT Register (CFR) and manage their accounts through the Ofgem E-serve interface.

14 The Green Deal

The Green Deal is the government's flagship energy efficiency scheme, designed to help property owners upgrade the energy performance of their buildings. Regulatory basis

The main regulations and guidance are as follows:

- Standard Licence Conditions (SLC35-38) in the electricity supply licence
- The Green Deal Framework Regulations[58]

58 The Green Deal Framework (Disclosure, Acknowledgment, Redress etc.) Regulations 2012 (SI 2012/2079)
59 DECC The Green Deal Code of Practice, 2012 [link]

- DECC's publication: The Green Deal Code of Practice[59] and Consumer Credit Act 1974.

Description

The scheme works by financing capital investments in improved energy performance and recovering the costs of the investment and financing through increased unit prices. The payments are associated with a property, not the property owner and form part of the tariff for the property even if the person who originally signed up to the Green Deal moves on. The scheme is based on a 'golden rule' - the expectation that the savings in energy will more than pay for the costs of the investment plus financing charges – it should therefore benefit all the participants and require no subsidy.

Green Deal participants

There are several ways in which a specialised energy services provider can participate in the Green Deal:

- **Green Deal Assessor:** employs advisers who make recommendations for measures that could improve the energy efficiency of the building
- **Green Deal Provider**: the counterparty to contract with the property owner, arranges finance and installation of the agreed energy efficiency products and systems
- **Green Deal Installer**: installs approved Green Deal products and systems on behalf of the Green Deal Provider
- **Green Deal Certification body**: authorises persons to act as assessors, providers or installers
- **Green Deal Licensed Supplier**: an electricity supplier that collects Green Deal payments and channels them to the other participants.

Role of electricity suppliers

Electricity suppliers are integral to the functioning of the Green Deal – they collect money from participating consumers via electricity bills and distribute funds to the Green Deal providers and/or finance providers to meet the cost of the Green Deal plans. The electricity supply licence has conditions (SLC35-38) governing the responsibilities of the Green Deal Licensees with respect to a central charging database, obligations under the Green Deal, information requirements and responsibilities under the GDAA.

Green Deal Arrangements Agreement

The participating electricity suppliers (comprising Mandatory and Voluntary Green Deal Licensees) become parties to the Green Deal Arrangements Agreement (GDAA), which is the multi-party agreement between electricity suppliers, Green Deal providers, and finance providers. It sets out the governance for payment, collection and remittance of Green Deal charges. At the heart of this system is the Green Deal Central Charge (GDCC) database, which keeps track of payments and liabilities associated with each Green Deal plan. Each Green Deal Licensee has to have access to this database. The GDCC has been developed under the Master Registration Agreement, which is the multiparty agreement between suppliers and distribution

network operators governing the registration of electricity supply customers and facilitation of switching between suppliers.

Smaller suppliers

Suppliers with fewer than 250,000 customers are not required to become Green Deal Licensees, but may become Voluntary Green Deal Licensees. So far, the smaller suppliers have not taken up this voluntary option – though the government hopes that the Green Deal will be sufficiently attractive to consumers to drive voluntary participation by smaller suppliers. Given that the Green Deal is intended to benefit consumers through cost-effective energy efficiency improvements, a Non-Green Deal Licensee may be at a competitive disadvantage or lose customers to a Green Deal licensee, or their customers may forego potential benefits. There is therefore a trade-off for a small scale social enterprise – a greater administrative burden or to lose Green Deal opportunities for the supplier or customer.

15 The Energy Companies Obligation – mandatory energy efficiency obligations

From 2013, the government has replaced its previous two schemes[60] placing energy efficient obligations on suppliers with the new Energy Companies Obligation (ECO).

Regulatory basis

- The Electricity and Gas (Energy Companies Obligation) Order 2012[61]
- Energy Companies Obligation (ECO): Guidance for Suppliers[62]

Description

This is an obligation placed on energy suppliers requiring them to fund additional insulation projects, which either cannot or will not be funded by domestic customers through the Green Deal alone (ie. they would not be cost effective under the Green Deal 'golden rule'). DECC proposes to divide the obligation between energy suppliers "on the basis of their share of the gas and electricity supplied", with half the obligation allocated on the basis of electricity sales and half on the basis of gas sales. The ECO consists of three strands, with a fourth as a subcomponent:

- **Affordable Warmth**: an obligation to help households from low income groups, living in privately rented accommodation and identified through the benefits system. Energy suppliers face an obligation to save £4.2 billion on their customers' "notional" energy bills by March 2015 and can satisfy the obligation using the full range of energy efficiency measures.

60 The Carbon Emissions Reduction Target (CERT) and Community Energy Saving Programme (CESP) – now discontinued.
61 SI 2012/3018
62 Ofgem, Energy Companies Obligation (ECO): Guidance for Suppliers 2013 [link]

- **Carbon Savings Obligation (CSO)**: The obligation is to reduce lifetime carbon emissions from private households by 20.9 MtCO2 between January 2013 and March 2015. Only certain measures are eligible for recognition under the CSO including solid wall insulation and "hard-to-treat cavity wall insulation", as well as any thermal insulation measures packaged with SWI or hard-to-treat CWI.
- **Carbon Savings Communities (CSC)**: Energy suppliers can only satisfy the CSC by delivering insulation within defined low income areas (but not only to low income households within those areas). CSC allows energy suppliers to use the full range of insulation measures including all loft insulation and CWI. The CSC represents 20% of the total Carbon Savings Target (= CSO + CSC).
- **Rural Safeguard (RS)**: The Rural Safeguard is a "sub-obligation" nested within the CSC. The Rural Safeguard requires suppliers to meet at least 15% of their CSC obligation by serving rural households that are either (1) in receipt of benefits making them eligible for the Affordable Warmth subsidy or (2) in low income areas or in areas adjacent to low income areas.

16 Climate Change Levy and exemptions for renewables and CHP

The Climate Change Levy is a levy paid on the supply of primary fuels and electricity to non-domestic customers. It is administered by HM Revenue and Customs, which provides detailed guidance on the CCL63. Of particular interest to a community energy provider would be the exceptions made for renewable energy and for 'good quality' combined heat and power schemes. The exemption for CHP has now stopped, and is not discussed further.

Regulatory basis

The key regulation and guidance are:

- The Climate Change Levy (General) Regulations 2001[64] (as amended)
- Climate Change Levy: Renewables Exemption Guidance for Suppliers and Generators[65]

Description

The exemption system creates a currency of certificates (Renewables Levy Exemption Certificate or LECs) are electronic certificates. These are issued monthly, to accredited generating stations, for each Megawatt/hour (MWh) of renewable source electricity generated. LECs identify renewable source electricity produced by accredited renewable generating stations. Renewables LECs are part of the evidence required by

63 HMRC, Climate Change Levy – introduction [link]
64 SI 2001/838
65 Ofgem, Climate Change Levy: Renewables Exemption Guidance for Suppliers and Generators [link]

HM Revenue & Customs to demonstrate the amount of renewable source electricity supplied to non-domestic customers in the United Kingdom.

17 Renewable Heat Incentive

The Renewable Heat Incentive is designed to help the government meet overall renewable energy targets by increasing the amount of heat provided from renewable sources. The scheme is funded directly by the government and does not therefore involve suppliers socialising the costs through their tariffs. Different schemes apply to domestic and non-domestic premises, with full RHI support to households scheduled to begin in 2014.

Regulatory basis

- The Renewable Heat Incentive Scheme Regulations 2011[66]

Description

Non-domestic

The RHI opened for the non-domestic sector in 2011. It provides a subsidy, payable for 20 years for heat generated from biomass, biogas, geothermal, solar thermal collectors or ground or water source heat pumps. The participant registers with Ofgem and joins the RHI register, submits metering information and receives a quarterly premium payment for every KWh of heat generated based on a tariff[67].

Domestic

The RHI does not apply to single domestic premises until April 2014, though it can apply where a scheme provides heat to multiple domestic premises. For single domestic premises, the government provides support through the Renewable Heat Premium Payment scheme. This provides grants in the form of a one-off voucher to support purchase of renewable heat technologies until 31 March 2014. The RHPP is administered by the Energy Saving Trust[68].

66 SI 2011/2860
67 Ofgem, About the Renewable Heat Incentive [link]
68 Energy Saving Trust, Renewable Heat Premium Payment phase 2 [link]

18 Self regulation & industry led standards

There are several industry initiatives that aim to raise standards above the legally required minimum. Several of the most prominent are described briefly below.

- **Energy UK: Safety Net for Vulnerable Customers.** Aims to add to the protection of vulnerable customers and reduce disconnections[69].
- **Energy UK: Code of Practice for Accurate Bills.** Aims to improve quality, coverage and accuracy of billing[70].
- **Energy UK: Energy Sure Code.** Aims to improve quality and fairness of face-to-face energy marketing[71].
- **Ofgem: Confidence Code.** A code of practice for online domestic price comparison services, originally run by Consumer Focus, now adopted by Ofgem[72].
- **Ofgem: Green Supply Guidelines.** To provide guidance on green energy claims –avoiding double counting or misleading green claims[73].
- **Green Energy Supply Certification Scheme.** The Scheme verifies the claims made by energy suppliers against their green energy tariffs and similar to a kitemark, awards a 'Certified Green Energy' label to tariffs meeting the key principles set out in Ofgem's Guidelines[74].
- **Institute of Customer Services: ICS ServiceMark.** This is generic customer service accreditation that incorporates a staff survey, customer survey and independent assessment[75].
- **Institute of Credit management: Quality in Credit Management (QICM).** A generic certification aiming to improve the credit management function[76].

19 Significant future developments

Electricity market reform

The EMR is a major change in the structure of the electricity market. Its purpose is to provide a new basis for contracting large-scale low-carbon energy sources, such as large wind farms or nuclear power stations. It also provides a carbon price floor (a minimum carbon price to supplement the EU ETS); a capacity mechanism (payments

69 Energy UK, The Energy UK Safety Net Protecting Vulnerable Customers from Disconnection, March 2013 [link]
70 Energy UK: Code of practice for Accurate Bills. [link]
71 Energy UK: Energy Sure Code. [link]
72 Ofgem, Confidence Code - code of practice for online domestic price comparison services [link]
73 Ofgem, Green Supply Guidelines [link]
74 Green Energy Supply Certification Scheme [link]
75 Institute of Customer Services (ICS) ServiceMark [link]
76 Institute of Credit Management: Quality in Credit Management (QICM). [link]

for making capacity available) and an Emissions Performance Standard (a limit to the carbon intensity of new power stations). The main impact on suppliers will be the new contracting regime. The new contracting regime, the Feed in Tariff / Contract for Difference (FIT/CFD), is a designed to provide a secure fixed price for large scale renewable and nuclear developments. This will replace the Renewables Obligation from 2017 and provide the support for nuclear generation via what are effectively fixed price contracts per MWh.

Impact on suppliers

The costs of the FIT/CFD will be passed through to suppliers in proportion to their market share. A 'counterparty body' will be created to be the contractual interface between suppliers and generators and there will be a statutory obligation placed on suppliers to make payments to the body.

OFGEM retail review

Ofgem has reviewed business practices in the retail market and made proposals to make the energy supply business "simpler, clearer and fairer" from the domestic customer perspective[77].

Impact on suppliers

The package of proposed measures places restrictions on what suppliers can offer customers and aims to reduce the number of customers on expensive long-established tariffs. Without such reforms there has been a danger that incumbent 'Big Six' suppliers will keep many customers on expensive uncompetitive 'dead' tariffs, whilst offering aggressive attractively priced tariffs to new customers, thus creating a barrier to entry to new suppliers. The proposals should, therefore, help new suppliers. The main effects are:

- a limit on the number of tariffs each supplier can offer
- simple, standard choices across each tariff, e.g. on whether you want to pay by direct debit
- removal of complex two-tier tariffs
- an obligation on suppliers will be required to inform consumers of their most attractive tariff
- suppliers will not be allowed to keep customers on a 'dead tariff', i.e. a standard variable rate tariff that is no longer open to new customers
- a standard way of describing the cost of tariffs (a Tariff Comparison Rate) to help customers compare – and to help others compile best buy tables
- clear rules for tariffs relating to collective switching initiatives.

The reforms would be delivered by new standard licensing condition inserted in SLC 22, 23, 25, 31 and a range of amendments to other SLCs.

77 Ofgem, The Retail Market Review - Final domestic proposals [link]

20 Overview of the regime and regulations

The consumer credit licensing regime, (as underpinned by the Consumer Credit Act 1974), is relevant for most businesses if they offer goods and services on credit or for hire. The ability to pay in arrears / and or instalments (four or more in a 12month period), also qualifies a business as needing a licence. In the most part compliance is not onerous, either in time or direct financial impact vis a vis a licence fees. The regulations set out requirements, which are aimed at ensuring that consumers are well informed of their rights and are suitably protected – in the most part this comes in the form of information requirements, clear advertising of offers / products and the application of fair processes to settle any debt. On whole the licensing regime should not pose a risk to the business model, but it must be adhered to.

21 Consumer Credit Licensing Detailed summary

Under the Consumer Credit Act 1974 most businesses that provide goods and services on credit or for hire, lend money or provide debt collecting, debt counseling or debt adjusting services to consumers need to have a credit licence.

Trading in credit activities without a credit licence is a criminal offence and as such it is vital that any business model applies for the appropriate licence. The process of obtaining a licence is itself straight forward, and the financial implications are not significant.

The credit regime is currently the subject of a Government consultation which will result in potential significant reform of the credit regime and associated impact on business – both in terms of compliance and financial costs. The consultations conclude in mid 2013, with the aim of the new regime taking affect post 2014.

Relevance to the business model

It is clear that the business would need to obtain a Consumer Credit Licence (CCL). Offering the ability to pay in arrears, and the ability for customers to pay in four or fewer instalments a year qualifies the company to acquire a CCL.

Impact of requiring a CCL

Before the company can trade it will require to apply for, and obtain, a CCL. The application process is detailed below, along with details of costs.

Aside from holding a licence, the regulations also set out rules on aspects such as advertising, pre contract disclosure, credit agreements and post contractual information. In addition, the Act confers certain rights on consumers, including in relation to withdrawal from a credit agreement, early settlement, and section 75 (joint and several liability). Each of these aspects are outlined below.

Applying for a CCL

Application is, in the main, an online process. Among the checks made of the business is a fitness to hold licence test of key individuals who run / own the company. The licence itself is issued in the name of the company and any trading names. Names can be added to this licence, at a cost.

Fees for Consumer Credit Licensing covers the cost of considering and processing the application, alongside a CCJ levy - which is an industry levy to fund the Financial Ombudsman Service.

The current total cost for a company, is **£1466**, made up of £1326 - Consumer Credit Licensing Fee and £140 - CCJ Levy.

Key provisions

Some, although possibly not all of the CCA provisions, may apply to the business model. A full legal opinion of the relevance should be undertaken at the appropriate time and the relevant legislation is signposted throughout. Below is a summary of the key provisions which might apply.

- Pre contract information
- Post contract information
- Early settlement
- Credit advertising
- Unenforcable credit agreements
- Information sheets
- Time orders

Pre Contract information

The Consumer Credit Act 1974 lays down rules requiring information to be given to borrowers or hirers before entry into a consumer credit or hire agreement.

New regulations requiring information to be given to borrowers before entry into a credit agreement came fully into force on 1 February 2011, implementing provisions of the Consumer Credit Directive (CCD).

Disclosing information in good time - Consumer Credit (Disclosure of Information) Regulations 2010

The 2010 regulations apply to unsecured credit including loans, hire-purchase, credit cards and overdrafts. They may also apply to some secured credit, but this is not relevant for the purposes of this report.

The regulations require certain information to be disclosed to the borrower 'in good time' before they enter into a credit agreement. In most cases this must be by means of a standard form, the Pre-contract Credit Information (PCI) form. The format and ordering of the form are prescribed. The borrower must be able to take the PCI away, so that he can consider and shop around.

There are special rules for telephone and distance contracts, and for overdrafts and pawnbroking. The provisions for distance selling based contracts may be relevant depending on the nature of the business model – particularly if there is an intention to 'future proof' the model.

Importantly, if the requirements are not followed, the agreement will be unenforceable without a court order.

Adequate explanations – section 55A of Consumer Credit Act

The new section 55A of the Consumer Credit Act requires creditors (or intermediaries acting on their behalf) to provide an adequate explanation to the borrower pre-contract. This must enable the borrower to assess whether the agreement is suited to his needs and financial situation. In particular, the explanation must cover:

- any features of the credit which may make it unsuitable for particular types of use
- how much the borrower will pay periodically and in total
- features which may have a significant adverse effect in a way that the borrower is unlikely to foresee
- the principal consequences of failure to make repayments, including legal proceedings and repossession where applicable
- the right of withdrawal and how/when this can be exercised.

In addition, the borrower must be advised to consider the PCI and that he can take it away and can ask questions. He must also be advised how to ask the creditor for further information or explanation. The explanation and advice must be given orally in certain circumstances.

Post-contract information

The Consumer Credit Act 1974 lays down rules requiring information to be given to borrowers or hirers during the lifetime of a regulated consumer credit agreement or consumer hire agreement.

Statements and notices

The Act includes requirements in respect of:

- annual statements for fixed-sum credit agreements
- periodic statements for running-account credit

- notice of variation of an agreement
- notices of sums in arrears
- notices of default sums
- default notices
- enforcement and termination notices
- notices relating to post-judgment interest
- information to be provided on request.

These are contained in Parts VI and VII of the Act, and in various regulations including the Consumer Credit (Information Requirements and Duration of Licences and Charges) Regulations 2007.

These have since been amended as part of implementation of the Consumer Credit Directive (CCD) from 1 February 2011. The CCD mainly made changes in relation to

- notification of interest rate changes – this is unlikely to be relevant to this analysis
- periodic information on overdraft rates and charges – this is likely to be of limited relevance, except where there might be provision for late payment charges.
- information on significant overrunning (that is, unauthorised overdraft) – this is unlikely to be relevant to this analysis
- right to request an amortisation table (showing instalments owing)
- notification of assignment of rights – this may have some limited relevance in relation to policies adopted for collecting debts.

The changes are contained in the Consumer Credit (EU Directive) Regulations 2010. The OFT has published guidance on Post-contract information requirements (July 2008) (pdf 141 kb) which may be useful reference material.

Early settlement

Under the Consumer Credit Act 1974 the borrower can settle a regulated consumer credit agreement early by giving notice to the lender and paying the amount due less a rebate. The borrower is also entitled to information about the amount needed to settle.

This has been extended from 1 February 2011 to provide a new right of partial early repayment. There are also new rules on withdrawal from and termination of a credit agreement.

The changes arise from implementation of the Consumer Credit Directive (CCD), and are contained in the Consumer Credit (EU Directive) Regulations 2010.

Although focused on main stream credit businesses it is likely that these provisions will apply in this instance.

Credit advertising

New credit advertising regulations came into force on 1 February 2011, implementing the Consumer Credit Directive.

The Consumer Credit (Advertisements) Regulations 2010 regulations apply to unsecured credit including loans, hire-purchase and credit cards. They apply to all forms of advertising, including in print (for example, newspapers, circular letters, flyers, catalogues or billboards), on television or radio, on the internet, on teletext or by way of telephone canvassing. However, in the main these regulations are aimed at advertisements which include interest rate information, which is not likely to be relevant to this business model. It is however, sensible to ensure that any advertisements are compliant with the broader rules.

The broader regulations which arise from the Consumer protection from Unfair Trading Regulations 2008 , (CPRs) also apply in this instance. The CPRs prohibit unfair commercial practices, including misleading actions or omissions. For example, if an advertisement contains false information or is likely to deceive consumers in relation to specified matters, or if it omits or hides material information or provides such information in a manner which is unclear, unintelligible, ambiguous or untimely.

Unenforceable credit agreements

Under the provisions relating to credit agreements, borrowers and hirers are able to ask creditors to send them information about their credit agreements. If information is not provided within 12 working days, the debt becomes unenforceable until they get the information they asked for.

Sections 77, 78 and 79 of the Consumer Credit Act 1974 outline the information creditors must provide to debtors under fixed-term, running account and hire agreements.

Under these sections a debtor can pay £1 to get:

- a copy of their agreement
- copies of some of the other documents mentioned in their agreement
- a statement of account.

If this information is not provided within 12 working days the debt becomes unenforceable. This means a creditor:

- cannot:
  - make the debtor pay the debt before they're supposed to
  - get a court judgment against the debtor
  - take back anything hired or bought on credit, or take anything used as security in the agreement.

- can:
  - ask debtors to pay what they owe
  - send a default notice
  - pass information on to a credit reference agency
  - pass information on to a debt collector
  - sell the debt to someone else
  - take the case to court.

Information sheets

The Consumer Credit Act 1974, as amended, requires the OFT to prepare and give

general notice of information sheets to accompany arrears notices and default notices. Lenders are required (since 1 October 2008) to include a copy of the current information sheet with each relevant notice under the Act.

The information sheets are intended to help debtors and hirers who receive arrears notices or default notices under the Act, by providing information on key rights and responsibilities and where to go for help or advice. In the event that

Time orders and debt repayment

In the cases of debt repayment, Section 129 of the 1974 Act provides that a court can make a time order, giving the consumer more time to repay a debt under a regulated consumer credit or consumer hire agreement, if the court considers it 'just' to do so.

The time orders can be sought by either party – i.e. consumer can apply for a time order following receipt of a default notice, or a notice of enforcement action under the Act, or a 'lender' can seek a time order as part proceedings to enforce an agreement.

A consumer can also apply for a time order following receipt of an arrears notice, provided that s/he first gives notice to the lender and submits an alternative payment proposal, and at least 14 days elapse before an application is made to the court.

Possible future changes

On 1 April 2014, the regulation of the consumer credit market will be transferred from the Office of Fair Trading (OFT) to the Financial Conduct Authority (FCA).This move was announced by the Government, with the aim of increasing protection for consumers.

In March 2013 the Government and the FSA published parallel consultation documents setting out proposals for this transfer.

It is not yet known what the final consumer credit regime will look like and what the regulatory requirements are likely to be. The underlying legislation which sets out the rights of consumers and the obligations of lenders is unlikely to change, however the mechanisms for obtaining a licence, remaining on the register and any supervisory requirements may be subject to change. A review of the new regulatory regime as it applies to utility companies and this particular business model should be undertaken once the changes have been announced.

22 Registered Social Landlords

The following section provides a brief overview of the regulatory regime as it applies to Registered Social Landlords (RSL's) in Scotland, with specific reference to energy.

Regulatory and legislative Framework

The Scottish Housing Regulator (SHR) regulates social landlords in Scotland. It has a statutory objective,

> *To safeguard and promote the interests of current and future tenants, homeless people and other people who use services provided by social landlords.*

The SHR monitors social landlords against the standards of the Social Housing Charter. The guidance on the housing quality standard indicates that,

> *...landlords should be looking for cost effective ways of achieving higher energy-efficiency standards for their properties, to provide warmer homes for their tenants and help meet climate change targets.*

The standards on value for money indicate that social landlords should manage their business so,

> *tenants, owners and other customers receive services that provide continually improving value for the rent and other charges they pay,*

Under the Charter, social landlords must set rents and service charges in consultation with their tenants and other customers.

The Housing (Scotland) Act 2001, Section 11, indicates that social landlords must inform Scottish secure tenants of any increase in rent or any other charge payable under the tenancy at least four weeks in advance of any rental period, consult tenants affected by any increase beforehand, and have regard to the views of those consulted. This would only be relevant to social landlords if they were providing heat as a service. As indicated below, there are questions over whether and in what circumstances this is permitted and is not what is proposed in setting up an RSL ESCo.

Practice

In the past, RSLs have sometimes directly supplied energy in "heat with rent" schemes. There has been a move away from this. They involve some risk to the landlord and do not encourage sustainable living. It is unclear whether the arrangements for such schemes would always have met OFT guidelines.

As regards combined heat and power (CHP) systems, which are increasingly being used in large-scale housing developments to supply heat to new build schemes, a

number of complex legal issues may arise[81]. These involve a financial risk to the landlord, and contractual obligations on the landlord to ensure that tenants set up a direct debit with the energy company. Such arrangements may raise issues under OFT guidelines.

Implications for an ESCo

Applying the legal and regulatory framework to an ESCo, there do not appear to be any regulations that prevent RSLs from setting up an energy supply company and offering a service to their tenants. It seems unlikely that RSLs could compel customers to switch to that company, but there appears to be nothing that would prevent them from switching the supply in void properties to the company.

From Dumb to Smart

The roll out of Smart Meters

West Highland
Housing Association

Chapter Summary

Government plans and ambitions

The UK government plans to install both electricity and gas “smart meters” in all homes and small non-domestic premises by 2019. This exceeds a European Directive, under which member states are required to roll-out intelligent metering systems across at least 80% of all electricity consumers by 2020. This means that fifty three million smart meters are due to be rolled-out across 30 million domestic properties and non-domestic premises, between 2014 and 2019. There are two ‘generations’ of smart meter and it is the second generation (SMET2) that presents the major opportunities for prepayment meter customers. The specification and timing for SMET2 meters has not yet been settled and this is expected to happen later in 2013.

Smart meters will carry out the same function as existing utility meters in the home, but are capable of two way communication which allows energy data to be read remotely by an external party, e.g. the energy supplier, or from an in-home display (IHD). The IHD communicates real time and historic energy consumption data to the occupants. It can also display a range of information including cost and CO2 emission data, and features a traffic light display to indicate current electricity usage.

The UK government believes that access to better energy information can contribute to a 2.8% reduction in electricity consumption and 2.0% reduction in gas consumption. The net benefits associated with the smart meter programme are estimated at £7.8 billion by 2020.

The smart meter implementation programme forms an integral part of the UK Government’s ambitions for Great Britain to transition to a more low carbon economy, as it will go a long way to provide the infrastructural basis required for the development of a smart energy grid. A ‘smart grid’ will facilitate more efficient energy generation and distribution across Great Britain, using information obtained from the smart meter network. This will provide the capacity to deliver a reliable electricity supply in the context of an increasingly complex generation and distribution network, as Great Britain adopts more renewable energy technologies. Smart Meter roll out is closely linked with the Scottish Government´s own plans to influence sustainable behaviour, and thereby to reduce emissions.

Responsibility for the development and delivery of the smart meter programme has been undertaken by Ofgem and DECC each taking responsibility for different aspects of the process. The programme is split into three phases:

- Phase 1 - Policy Design phase, which involved extensive stakeholder consultation, concluded in March 2011
- Phase 2 - ‘Foundation Stage’, which is geared towards laying the foundation for a smooth transition to mass roll-out, includes technical and regulatory

specifications, trialling first generation smart meters, and the establishment of the new licensed entity – the Data and Communication Company (DCC) - to provide centralized data and communication services to the market ,is ongoing

- Phase 3 - Mass rollout, due to commence in 2014.

In Scotland, smart meters have been piloted as far back as 2007, with projects such as that of the Scottish Government Energy Unit's Smart Metering project. The project which involved the installation of smart electricity meters across 12 Local Authorities and Scottish Water as a large energy consumer, was aimed at providing accurate information on energy consumption patterns and the development of a benchmarking facility for local authorities[9]. The Scottish Government will now deliver to UK Government targets set under the current smart meter implementation programme. The smart meter rollout has been considered in the context of other climate change policies being delivered by the Scottish Government as shown in table 1, and other policies such as the Home Energy Efficiency Programmes for Scotland Area Based Scheme (HEEPS:ABS), have the scope to include smart meter installation in homes[10].

Cost of implementation

As part of their responsibility towards the delivery of smart meter systems across domestic and small non-domestic premises, energy suppliers are expected to bear the capital costs of the rollout; an estimated £650 million. The assumed average cost of the smart electricity and gas meters installed at scale is £44.95 and £59 respectively, with respective installation costs of £29 and £49. The installation cost falls to £68 if both meters are installed together. It is planned that suppliers will recover the costs of the roll-out from customers, as they do when installing meters at present although it is likely that many suppliers will 'rent' meters from meter operators. The costs of the meters will result in an initial rise in the average domestic consumer bill, peaking at a £7 increase in 2015, after which point consumers will start to see savings on their utility bills. Table 3 details the financial impact of the rollout on domestic and non-domestic consumers. In spite of this, concerns have been raised by consumer groups over issues of transparency in the reflection of the installation costs within the consumers' utility bills and more generally whether operational savings will be passed on to the consumer.

Customer Engagement

Suppliers will be expected to engage with customers before, during and after the installation to ensure the installation experience is as effective and efficient as possible, and provides maximum benefits to the consumers. Emphasis has been placed on addressing issues related to vulnerable and low income consumers, as well as leveraging consumer support during the rollout. To this end, the DECC has produced a publication on the role of community groups within the implementation programme, as well as a study of vulnerable and low income communities.

Code of Practice

DECC in collaboration with Ofgem and Energy UK have produced a Code of Practice that will govern the installation of smart meters for both domestic and non-domestic

9 Moray Council (2007a) Report to Policy Committee on Scottish Government Smart metering project. [Online] Available: http://www.moray.gov.uk/minutes/data/PH20071024/item31scottishgovsmartmeteringproject.pdf (Accessed: 21st Mar 2013) and (2007b) Report to Policy Committee: summary of planned energy saving projects. [Online] Available: http://www.moray.gov.uk/minutes/data/PH20071024/item18summaryofplannedenergysavingprojects.pdf (Accessed: 22nd Mar 2013)

10 The Scottish Government, (2012) Homes that don't cost the earth: a consultation on Scotland's Sustainable Housing Strategy. [Online] Available: http://www.scotland.gov.uk/Resource/0039/00395756.pdf (Accessed: 22nd Mar 2013)

premises. It is expected to come into effect in the Spring of 2013 and will be governed by a Board including representatives of domestic and non-domestic suppliers and Consumer Focus, as the statutory consumer body.

Opportunities, Benefits and Risks

There are a number of risks, benefits and opportunities arising from smart meter roll out for consumers, suppliers and indeed the Government. Benefits and opportunities can be identified as:

The risks involve:

Customers

- The costs of implementation and who will bear these and how
    - Data security
    - For pre-payment meters: whether costs to customers will be reduced; prepayment options, convenience and consumer protection; functionality and ensuring that that consumers can switch between prepayment and credit modes
    - Continuity of supply and usage data through meter switch
    - Continuity of supply and usage data through meter switch
    - Meter functionality and interoperability, including issues that arise from the first generation of smart meters, and compliance with micro-generation schemes
    - Quality of installation
    - Supplier compliance with the Code of Practice

While there are risks for consumers and suppliers associated with the roll out of smart meters across the UK, an RSL ESsCo focused on the provision of affordable energy from renewable sources is well place to address these, and the opportunities for both parties outweigh the risks. With effective identification and management of risk, the consumer and supplier stand to reap significant benefits in reduced costs, increased convenience, emissions targets and from the promotion of consumer rights.

1 Introduction

The UK plans to install both electricity and gas “smart meters” in all homes and small non-domestic premises by 2019. This exceeds a European Directive, under which member states are required to roll-out intelligent metering systems across at least 80% of all electricity consumers by 2020. Fifty three million smart meters are due to be rolled-out across 30 million domestic properties and non-domestic premises, between 2014 and 2019.

The government believes that access to better energy information can contribute to a 2.8% reduction in electricity consumption and 2.0% reduction in gas consumption. The net benefits associated with the smart meter programme are estimated at £7.8 billion by 2020.

The smart meter roll-out is not compulsory, and consumers can choose to opt-out. However, the aim is that the introduction of the technology will create a platform from which it will be possible to support smart grids. These can help manage supply and demand across the network, and maximise opportunities to utilise low-carbon energy sources. Customers can take advantage of this via time of use (TOU) tariffs, which will offer financial incentives to shift energy usage to periods of low demand.

This report provides an overview of the planned roll out of smart meters across Great Britain, and explores the benefits and potential risks for an ESsCo and for consumers, with a particular focus on low income customers. It outlines the factors that an ESsCo must consider in operating during and after the roll out of smart meters, and identifies the employment and training opportunities that their installation and management raise. It is aligned with the workstreams on payment methods, the financial model and the regulatory framework.

Aims and methodology

The aims of this workstream are:

- To map UK and Scottish government ambitions for the roll out of smart meters and the timetable for this,
- To indicate the risks, opportunities and benefits of smart meters for an ESsCo and consumers and to consider consumer attitudes
- To identify the pattern of distribution network operator (DNO) charges across Scotland, and identify strategies for minimizing these or improving understanding where these charges are unavoidable
- Consider how DECC plans for DNOs may impact on an ESsCo and what opportunities they might present
- Identify employment and training opportunities for meter installation and management

The report draws heavily on desk top research undertaken by the Urban Energy Research Group at Heriot-Watt University[11] and the Centre for Sustainable Practice at Robert Gordon University[12]. In addition it draws on the findings of a qualitative

survey conducted by Robert Gordon University on attitudes to energy purchase of the tenants of two Scottish Registered Social Landlords[13]. The research was undertaken specifically for this Warm Homes Funded project and the reports produced are available on request.

2 Government ambitions for smart meters

What is a smart meter?

Smart meters will carry out the same function as existing utility meters in the home, but are capable of two-way communication which allows energy data to be read remotely by an external party, e.g. the energy supplier, or from an in-home display (IHD).

Key advantages associated with smart meters include:

- An end to estimated billing
- Easier and faster switching between suppliers
- New products and more services
- Supplier access to more accurate data for billing and better customer service
- Reduced costs for energy suppliers (e.g. from reduced call centre costs, not needing to take meter readings, managing debt more efficiently).
- Greater ability for energy networks to manage and plan current activities and the move to a smart grid.

The IHD communicates real time and historic energy consumption data to the occupants. It can also display a range of information including cost and CO2 emission data, and features a traffic light display to indicate current electricity usage.

UK Government Ambitions

The UK Government plans to see the installation of smart gas and electricity meters in all domestic, small non-domestic and public sector properties in Great Britain by 2019

Department of Energy and Climate Change[14]

The legislative basis for the current smart meter policy dates back to the 2007 publication of the Labour Government's White Paper on Energy which indicated that consultations would commence on the installation of smart meters in businesses across the UK as well as trials within domestic properties over the following 10 years[15]

11 A Review of the UK Smart Meter Roll-Out, Sophie Simpson and David Jenkins, Urban Energy Research Group, Heriot-Watt University, April 2013
12 Implementing Smart Meters in Great Britain: Government Plans and Ambitions – Report for the Renewable Power Exchange Warm Homes Fund Project, Centre for Understanding Sustainable Practice, Robert Gordon University, March 2013
13 Attitudes to Energy Purchase by Scottish Housing Association Tenants, Mary Brown and Seonaidh McDonald, Robert Gordon University, April 2013
14 DECC (2012a) First Annual Progress Report on the Roll-out of Smart Meters. London: Department of Energy and Climate Change

Since then there have been various projects that have conducted smaller scale trials of smart meters in different parts of the UK[16]. The smart meter rollout programme forms part of a wider plan to develop smart energy grids across Great Britain and is one of a number of climate change oriented policies such as the 'Green Deal', which fall under the umbrella of the 2008 Energy Act (reviewed in 2011). In a bid to achieve the CO2 reduction targets, an 80% reduction from the 1990 baseline by 2050 as set out in the Climate Change Act 2008, the UK Government strives to foster more responsible energy consumption at individual level. As such the Government has recognised the role of smart meter technology in encouraging more sustainable behaviour by providing users more detailed information on their energy consumption patterns[17].

In 2009, the European Union (EU) issued a directive mandating the provision of intelligent gas and electric metering systems by member states depending on the outcomes of a cost benefit analysis. The 2012 version of the EU Energy Efficiency Directive goes on to set out a target of at least 80% smart electric meter coverage by 2020 in countries where the outcome of the assessment is positive. It also provides governance for the management of data related to the use of smart metering systems[18]. Countries across Europe have since launched smart meter roll out programmes which are at varying stages of progress; while others such as Italy completed the installation of 36 million smart meters serving all electricity customers in 2011[19]. In September 2012, the European Commission announced that it would consider producing a benchmarking report on the roll out of smart meters in mid-2013, based on feedback from the cost benefit analyses conducted by member states[20].

Unlike some other countries where the main focus of their smart meter implementation rollout has been on the operational management of the energy distribution network and safeguarding against issues such as energy theft, the approach adopted by the UK Government is committed to maximising user benefits [21]. The government has stated its desire to see that the programme serves to empower consumers, and that their interests lie at the heart of the programme. Consumer engagement has played a key role in the implementation programme with multiple rounds of consultations and responses on different aspects of the delivery at various stages of the process since plans were announced in 2008[22]. Furthermore, awareness

15 Darling, A. (2007) Meeting the Energy Challenge: A White Paper on Energy. [Online] Available: http://webarchive.nationalarchives.gov.uk/+/http://www.berr.gov.uk/energy/whitepaper/page39534.html (Accessed: 22nd Mar 2013)
16 Frontier Economics (2007) Smart Metering. [Online] Available: http://www.frontiereconomics.com/_library/publications/frontier%20paper%20-%20Centrica%20smart%20metering%20oct2007.pdf (Accessed: 22nd Mar 2013); Hargreaves, T. (2009) The Visible Energy Trial: Insights from Qualitative Interviews. [Online] Available: http://tyndall.ac.uk/sites/default/files/twp141.pdf (Accessed: 22nd Mar 2013); Johnson, R. (2010) A review of smart metering options for energy. [Online] Available: http://www.dehems.eu/cms/wp-content/uploads/2010/11/A-review-of-smart-metering-andsurvey-options-for-energy.pdf (Accessed: 21st Mar 2013)
17 Ofgem & DECC (2010) Smart Metering Implementation Programme: Prospectus. London: Office of Gas and Electricity Markets
18 European Commission (2009) Directive 2009/73/EC The European Parliament and of the Council. [Online] Available: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:211:0094:0136:en:PDF (Accessed: 21st Mar 2013)
19 DECC (2012a), op. cit.
20 European Council for an Energy Efficient Economy (2012) EU 'considering' 2013 benchmark report on smart meters. [Online] Available: http://www.eceee.org/news/News_2012/2012-09-18a (Accessed: 21st Mar 2013)
21 DECC 2012a, op. cit; Ofgem and DECC, 2011 op. cit.; DECC (2013a) Impact Assessment: Smart meter roll-out for the domestic and small and medium non-domestic sectors (GB). [Online] Available: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/78666/IA-Feb.pdf (Accessed: 21st Mar 2013); DECC (2013d) Smart Metering Implementation Programme: Smart Metering for Non-Domestic Customers. London: Department of Energy and Climate Change DECC (2013e) Smart Meters: A Guide. [Online] Available: https://www.gov.uk/smart-meters-how-they-work (Accessed: 21st Mar 2013)
22 Ofgem and DECC, 2011 op. cit; DECC, 2012a, op. cit; 2013a op. cit; 2013e op. cit; DECC (2013b) Role of Community Groups in Smart Metering-Related Energy Efficiency Activities. London: Department of Energy and Climate Change

amongst consumers is crucial for the implementation of smart meters to play its intended role in facilitating a shift towards more sustainable consumer behaviour with regards to energy use and the reduction of CO2 emissions.

The smart meter implementation programme is also to form an integral part of the UK Government's ambitions as Great Britain transitions to a more low carbon economy, as it will go a long way to provide the infrastructural basis required for the development of a smart energy grid. A 'smart grid' will facilitate more efficient energy generation and distribution across Great Britain, using information obtained from the smart meter network. This will provide the capacity to deliver a reliable electricity supply in the context of an increasingly complex generation and distribution network, as Great Britain adopts more renewable energy technologies[23]. While the Government has no firm plans in place for a smart grid, with input from the DECC`s Smart Meter Team and the Smart Grids Forum, jointly led by DECC and Ofgem, work is currently being carried out into potential options for the development of a smart grid by 2050[24]. Aside from its role in developing smart grids, the Government views the smart meter rollout as a paving the way towards "a smarter Great Britain" and the implementation of smart appliances, electric vehicles, micro-generation and new markets in energy services[25]. Figure 1 presents some of the key anticipated benefits of the smart meter implementation as identified by DECC and Ofgem. The risks and opportunities associated with smart meters are discussed later in the report.

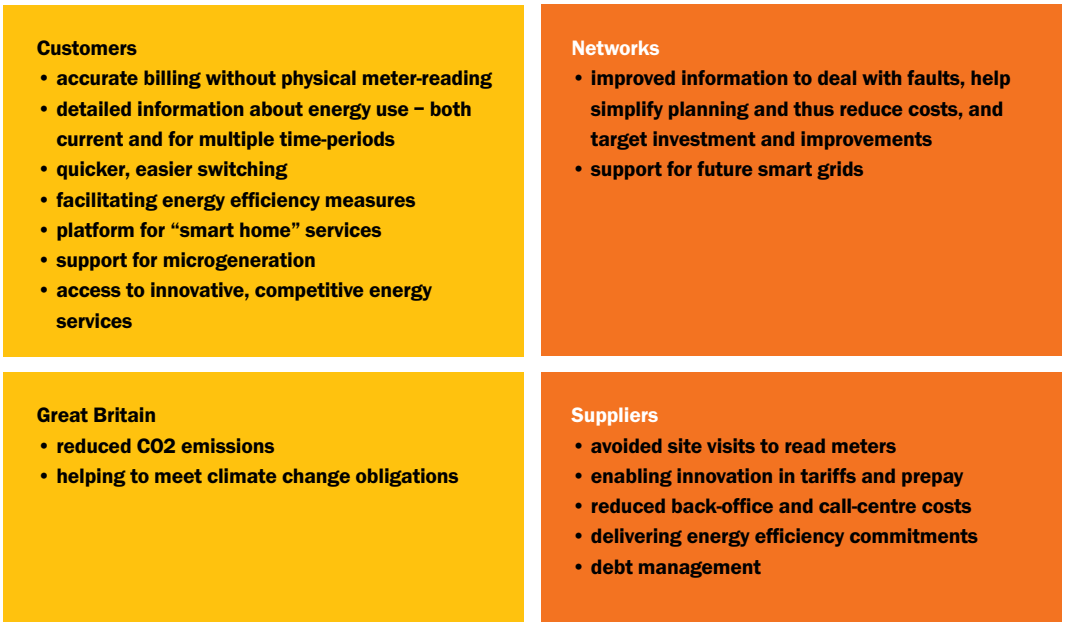


Fig. 1: Key Benefits of Smart Metering (Source: DECC 2013, Smart Metering Implementation Programme: Smart Metering for Non-Domestic Customers

23 Ofgem and DECC, 2010, op. cit; DECC 2013a op.cit.
24 Electricity Networks Strategy Group (ENSG) (2009) A Smart Grid Vision. [Online] Available:'http://webarchive.nationalarchives.gov.uk/20100919181607/http:/www.ensg.gov.uk/assets/ensg_smart_grid_wg_smart_grid_vision_final_issue_1.pdf (Accessed: 22nd Mar 2013); The Energy Networks Association & Imperial College London (2010) Benefits of Advanced Smart Metering for Demand Response based Control of Distribution Networks. [Online] Available: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48551/5759-electricity-system-analysis–future-system-benefit.pdf (Accessed: 22nd Mar 2013); The Smart Grid Forum (2011) How to deliver smarter grids in Great Britain. [Online] Available: http://www.ofgem.gov.uk/Networks/SGF/Publications/Documents1/RPT-Ofgem-Final%20Report%20for%20Smart%20Grids%20Forum-310311-STC.pdf (Accessed: 22nd Mar 2013); The Smart Grid Forum (2012) The Smart Grids Forum – First Year Report and Publication of the Smart Grid Evaluation Framework Final Report. [Online] Available: http://www.ofgem.gov.uk/Networks/SGF/Publications/Documents1/Frontier%20Final%20Report%20-%20Cover%20letter%20-%20Final.pdf (Accessed: 22nd Mar 2013); The Smart Grid Forum (2013) Smart Grid Forum Publications. [Online] Available: http://www.ofgem.gov.uk/Networks/SGF/Publications/Pages/index.aspx (Accessed: 22nd Mar 2013)
25 DECC (2012f) Smart Metering Implementation Programme: Programme Update April 2012. London: Department of Energy and Climate Change

Scottish Government Ambitions

In Scotland, smart meters have been piloted as far back as 2007, with projects such as that of the Scottish Government Energy Unit's Smart Metering project. The project which involved the installation of smart electricity meters across 12 Local Authorities and Scottish Water as a large energy consumer, was aimed at providing accurate information on energy consumption patterns and the development of a benchmarking facility for local authorities[26]. As part of Great Britain, the Scottish Government is delivering to UK Government targets set under the current smart meter implementation programme. The smart meter rollout has been considered in the context of other climate change policies being delivered by the Scottish Government as shown in table 1, and other policies such as the Home Energy Efficiency Programmes for Scotland Area Based Scheme (HEEPS:ABS) have the scope to include smart meter installation in homes[27].

	Earliest start date	Annual Abatement ($KtCO_2e$) 2020	Annual Abatement ($KtCO_2e$) 2027
Policies			
Smart Metering	2012	88	95
Domestic Buildings Energy Standards (2010) - New Build Properties	2010	76	142
Renewable Heat Incentive (Domestic)	2011	78	80
Energy Company Obligation (ECO) and Green Deal (GD)	2013	104	132
Home Energy Efficiency Programmes for Scotland Area Based Scheme (HEEPS:ABS)	2013	207	207
Warm Homes Fund	2013	23	22
District Heating Loan Fund	2011	36	36
Proposals			
Domestic Buildings Energy Standards (2014) - New Build Properties	2014	22	55
Regulation of Private and Social Housing	2014	63	152
National Retrofit Programme: Insulation and Heat Programme	2018	33	167
Low Carbon Heat (Domestic)	2013	99	609
Additional Technical Potential in Fabric and Energy Efficiency	2018	210	650

Figure 2: Current and Proposed Scottish Government Climate Change Polices (Source: The Scottish Government,2013 Low Carbon Scotland: Meeting our Emissions Reduction Targets 2013-2027)

26 Moray Council (2007a) Report to Policy Committee on Scottish Government Smart metering project. [Online] Available: http://www.moray.gov.uk/minutes/data/PH20071024/item31scottishgovsmartmeteringproject.pdf (Accessed: 21st Mar 2013) and (2007b) Report to Policy Committee: summary of planned energy saving projects. [Online] Available: http://www.moray.gov.uk/minutes/data/PH20071024/item18summaryofplannedenergysavingprojects.pdf (Accessed: 22nd Mar 2013)

27 The Scottish Government, (2012) Homes that don't cost the earth: a consultation on Scotland's Sustainable Housing Strategy. [Online] Available: http://www.scotland.gov.uk/Resource/0039/00395756.pdf (Accessed: 22nd Mar 2013)

In its statement on plans to meet emissions reduction targets, the Scottish Government outlined five key areas of transformation including understanding and influencing sustainable behaviour[28]. This is an aspect that has been closely linked to the smart meter rollout, with a large part of the smart meter implementation aimed at encouraging behavioural change. The Scottish Government along with the Northern Periphery Programme has funded the Energy Saving Trust's Smart Metering Advice Project. The project will see the Energy Saving Trust work with approximately 40 households in Dumfries, Galloway, the Highlands and the Islands to develop a web based tool and personalised advice service for customers to maximise the behavioural change potential of the smart meter rollout[29].

3 Implementing the Smart Meter Programme

Background to programme

The UK Government's smart meter programme is considered one of the largest and most complex to be undertaken by the energy industry. It will involve the replacement of approximately 53 million gas and electricity meters for domestic and smaller non-domestic customers across 30 million premises in Great Britain by 2019. Current estimates indicate that the installation and management of these smart meters will cost a total of £11.5 billion pounds. It has been suggested that the programme will generate £18.6 billion in benefits from reductions in energy consumption and cost savings in industry processes by 2030; thus a net benefit of £7.2 billion. This, along with other potential benefits, is discussed in detail in sections 4 and 5 below. t. Responsibility for the development and delivery of the smart meter programme has been undertaken by Ofgem and DECC each taking responsibility for different aspects of the process. The programme is split into three phases:

- Phase 1 - Policy Design phase, which concluded in March 2011
- Phase 2 - 'Foundation Stage', which is currently ongoing
- Phase 3 - Mass rollout, due to commence in 2014

Policy Design Phase

Phase 1 of the programme focused on setting out proposals for the key elements of the implementation process. It involved extensive stakeholder consultation, and resulted in responses from different stakeholder groups including members of the public, the energy industry, service providers, consumer groups, academics, and a wide range of energy users.

The key aims of Phase 1 included:

28 The Scottish Government, (2013) Low Carbon Scotland: Meeting our Emissions Reduction Targets 2013-2027. [Online] Available: http://www.scotland.gov.uk/Resource/0041/00413150.pdf (Accessed: 22nd Mar 2013)
29 Energy Saving Trust (2012) Smart Metering Advice Web-Tool and personalised advice service. [Online] Available: http://eu-smartcities.eu/content/problem-addressed-fact-increased-levels-information-about-household-energy-use-smart-meters (Accessed: 21st Mar 2013)

- Ensuring that smart metering rollout supports the overall objectives for the programme and is delivered in an economic and efficient manner that protects the interests of current and future consumers
- Facilitating more efficient energy management in homes and small businesses across the energy networks leading to carbon reduction
- Providing sufficient certainty for the industry to facilitate investment
- Providing necessary functional specifications for the technology elements of the smart metering system (including enabling smart grids)
- Delivering a co-ordinated approach for the rollout of smart meters to homes and businesses
- Where possible, providing flexibility in the commercial and regulatory arrangements to allow for future developments (such as smart grids)
- Addressing interfaces with other relevant public policies, for instance the Green Deal
- Developing proposals with full stakeholder engagement and keeping consumers at the heart of the programme

Ofgem and DECC, 2010

The work was managed by Ofgem on behalf of DECC, and involved a large scale trial and cost benefit analysis of '1st generation' smart meter technology[30]. Phase 1 of the programme concluded in March 2011 with the publication of the Government's Response to the Smart Meter Prospectus Consultation[31]. This document outlines the implementation process for the smart meter rollout, and forms the basis of the next two phases of the programme. The report draws conclusions on the organisation and regulation of the rollout, as well as the role of a central body to manage data and communications and the overall consumer experience. An important conclusion of this phase was the acceleration of the programme plan which brought the completion date forward to 2019; a year ahead of the original 2020 target.

Key Conclusions of the Policy Design Phase

- **Suppliers should be set licence obligations to deliver the rollout of smart metering in the domestic and smaller non-domestic sectors, underpinned by an appropriate compliance regime.**
- **The Government will bring forward a proposal to obligate suppliers to take all reasonable steps to complete the rollout in 2019. It will initiate a consultation on detailed licence obligations on this basis, with a view to these coming into effect in the first half of 2012.**
- **From the start of the mass rollout, envisaged to be at the start of the second quarter of 2014, suppliers should be required to take all reasonable steps to install only compliant smart meters.**
- **The period before the second quarter of 2014 will provide the opportunity to build a solid foundation for the mass rollout of smart meters. During this foundation stage, measures should be put in place to support technical and commercial interoperability. Industry participants may be required to conduct activities and deliver outputs in accordance with the programme's approach to building market readiness to be developed in the next phase.**

The programme will review rollout progress during the foundation stage and will propose changes to these arrangements if appropriate ahead of the mass rollout.

Ofgem and DECC, 2011

The Foundation Phase

The Foundation Stage commenced at the conclusion of Policy Design Phase in March 2011, and marks the current stage of the implementation programme. The phase is geared towards laying the foundations for a smooth transition to Phase 3 of the programme. The key deliverables and outcomes of Phase 2 include:

- Consumer awareness, confidence and protection measures that will facilitate positive adoption and enable benefits realisation
- Technical specifications for the smart metering system, consistent with the minimum functional requirements, which will provide for appropriate levels of interoperability
- A new regulatory regime that will provide certainty and hence underpin investment, create appropriate governance and enforce the right behaviours
- Establishment of a new licensed entity, the Data and Communications Company (DCC), ready to provide centralised data and communications services to the market
- Business readiness across the industry, including the availability of compliant meters and installation staff, the establishment of appropriate commercial arrangements, the development of central and distributed processes and systems, end-to-end testing and trialing of the market infrastructure and preparation for the migration to the DCC environment.
- A market framework that will enable an active market in smart metering prior to DCC starting operation, for suppliers whose strategy involves early deployments, including arrangements to support commercial and technical interoperability.

Ofgem and DECC, 2011

Since the inception of Phase 2 in 2011, the Government has taken steps towards meeting some of the targets set out in the foundations stage including:

- A consultation on the licence conditions and the technical specification for the rollout of smart gas and electricity metering, which was published in August 2011.
- Commencement of the process for procuring the data and communications services in August 2011.
- A call for evidence on data access and privacy, also in August 2011.
- A consultation on the detailed policy design of the regulatory and commercial framework for the DCC which was published in September 2011.
- A consultation on the DCC Prohibition Order for smart metering communications services, in February 2012.
- Smart Metering Equipment Technical Specifications (SMETS) in April 2012.
- Update to the Smart Meter Implementation Plan published in April 2012.
- First Annual Progress Report on the Rollout published in December 2012.
- Response to the Consultation on the second version of the Smart Metering

32 DECC, 2012a, op. cit; DECC (2012f) Smart Metering Implementation Programme: Programme Update April 2012. London: Department of Energy and Climate Change; DECC (2013c) Smart Metering Implementation Programme: Government Response to the Consultation on the second version of the Smart Metering Equipment Technical Specifications Part 1. London: Department of Energy and Climate Change

The 2011 Response to the Consultation on the Prospectus set out the minimum functional requirements for the smart metering systems (see table 2), which formed the basis of the Smart Metering Equipment Technical Specifications published in 2012 and 2013[33].

Table 2: Minimum Functional Requirements of Smart Meter Systems (Source: Ofgem and DECC, 2011, Smart Metering Implementation Programme: Response to Prospectus Consultation.)

High-level functions of the smart metering system		Electricity	Gas
A	Remote provision of accurate reads/information for defined time periods - delivery of information to customers, suppliers and other designated market organisation	✓	✓
B	Two way communications to the meter system communications between the meter and energy supplier or other designated market organisation upload and download data through a link to the wide area network, transfer data at defined periods, remote configuration and diagnostics, software and firmware changes	✓	✓
C	Home area network based on open standards and protocols provide "real time" information to an in-home display enable other devices to link to the meter system	✓	✓
D	Support for a range of time of use tariffs multiple registers within the meter for billing purposes	✓	✓
E	Load management capability to deliver demand side management ability to remotely control electricity load for more sophisticated control of devices in the home	✓	
F	Remote disablement and enablement of supply that will support remote switching between credit and repayment modes		✓ (Domestic Only)
G	Exported electricity measurement measure net export	✓	
H	Capacity to communicate with a measurement device within a microgenerator receive, store, communicate total generation for billing	✓	

All households are to be fitted with an In-Home Display (IHD) unit. This will be the most visible part of the meter, and serve as the consumer interface. The provision of the IHDs is the responsibility of the suppliers as part of the rollout.

The IHD will give customers easy access to information from their gas and electricity meters, about their energy consumption. The April 2012 SMETS[34] outlines the minimum requirements for the IHDs, stating that they must show:

- cumulative consumption, i.e. how much energy has been used so far in the current day/week/month;
- historical consumption, i.e. how much energy was used yesterday, last week, last month and in the last 12 month period;
- whether electricity consumption at a given time is high, medium or low;
- all information on energy consumption to be shown in pounds and pence, as well as kWh.

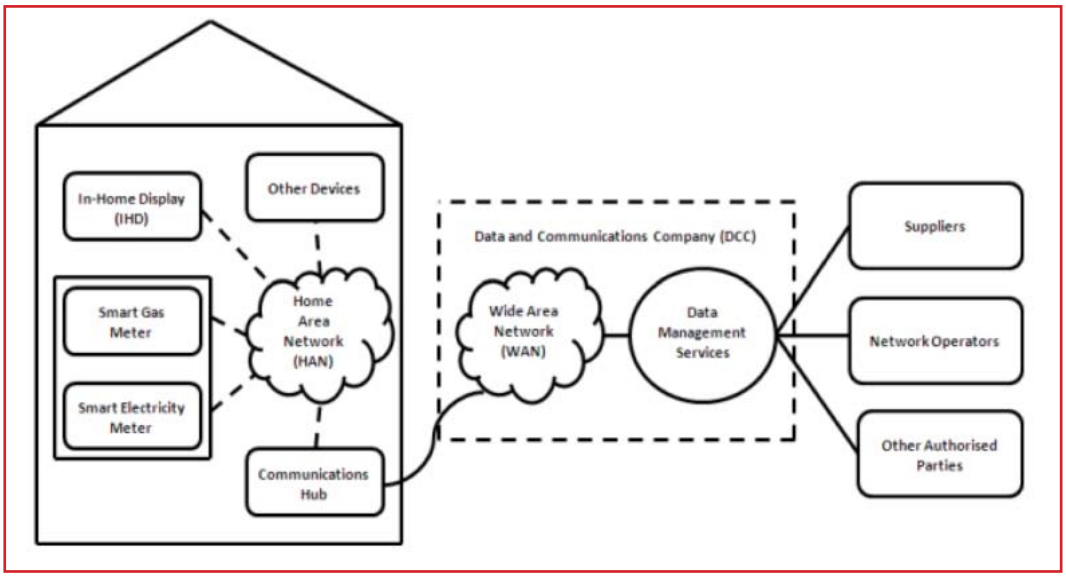
33 Ofgem and DECC, 2011, op. cit; DECC, 2012e, op. cit; DECC, 2013c, op. cit.
34 DECC, 2012e, op. cit.

In addition, IHDs for customers with prepayment meters must show

- the meter balance;
- emergency credit balance;
- debt recovery rate; and
- have the ability to give a low credit alert.

The Government proposals have outlined a structure for the Smart Metering Architecture (see figure 2). DCC, the new licensed body regulated by Ofgem, is a key part of this. It will control the access to the smart metering data, providing a two-way communications channel between smart meters and a central communications hub to which smart meter data users (suppliers, network companies and other authorised third parties) will have access for specified purposes. For example energy suppliers will use the DCC to collect meter readings remotely in order to bill customers accurately, and network operators will use the meter data (on an aggregated basis) to manage demand and plan investment. Furthermore, when prepayment customers top-up their meters, energy suppliers will update the meter via the DCC. Final proposals for the licence application for the selection of a regulated private sector organisation as the DCC are underway, with a view to awarding a licence in July 2013[35]. Consultations are also in progress for the development of a new industry code, the Smart Energy Code (SEC), which will outline regulations for the working relationships between different parties including suppliers, network operators, DCC, energy service providers, and other authorised parties[36].

Fig. 2: Proposed Smart Metering Architecture
(Source: DECC, 2012, First Annual Progress Report on the Roll-out of Smart Meters)



Under the Government plans, energy suppliers will be responsible for the delivery of the smart meters to consumers. While most households will have their smart meters installed during Phase 3, several suppliers have already begun to provide their customers with smart meters ahead of the mandated rollout[37]. Energy suppliers including British Gas, E-On, EDF, N Power, Scottish Power, Southern Electric, First

35 DECC, 2012a, op. cit; DECC (2012g) Smart Meters Programme: Smart Meters Programme Plan. London: Department of Energy and Climate Change
36 DECC (2013d) Smart Metering Implementation Programme: Smart Metering for Non-Domestic Customers. London: Department of Energy and Climate Change
37 Richards, P. (2012) House of Commons Standard Note: Smart Meters. London: HMSO

Utility and Utilita are among those that have started installing smart meters, trialling the technology ahead of the rollout in 2014[38].

Whilst the Government has not mandated specific volumes of meters to be installed during the Foundation Stage, suppliers have been installing '1st generation' smart type meters prior to technical publications being published [39]. By the end of September 2012, figures supplied by the larger suppliers (E-On, British Gas, N Power, EDF Energy, Scottish Power and SSE) revealed that a total of 623,200 smart-type and smart meters had been installed in domestic properties and 365,000 advanced and smart meters in non-domestic properties. Of those units only 300 '2nd generation' smart meters which meet the SMETS requirements had been installed in domestic properties. All other non SMETS compliant meters will have to be replaced by the end of 2019. However these '1st generation' trials still prove useful, providing information on the performance of their front line and back office systems as well as customer feedback, which is already refining their approaches to the transition[40]. Once the DCC is operational, the Government is also developing plans for testing and trialling both types of technology and, working with suppliers, alternative approaches to consumer engagement[41].

Phase 3: Mass Rollout

The mass roll-out of smart meters is expected to begin in late 2014 and be completed by the end of 2019. It will involve the rollout of '2nd generation' smart meters across the UK, which unlike their '1st generation' counterparts will have the capacity to support more innovative tariffs and more flexible payment options including prepayment and remote credit top up facilities[42]. According to Government proposals, energy suppliers will be required to procure and install smart meters for their domestic and small non-domestic customers by 2019. This will include the installation of IHDs for domestic customers. It is expected that different energy suppliers will have their own plans for the rollout, based on their various business and customer needs, however they would be required to use metering equipment that meets the technical specifications, as well as adhere to the programme deadline of 2019. While the energy suppliers' adopted approaches may change the course of the programme, the government has proposed that individual suppliers create a programme framework which specifies their intended completion date and will serve as a means of monitoring progress[43].

The 'big six' energy suppliers (E-On, British Gas, N Power, EDF Energy, Scottish Power and SSE) provided information about their progress on the delivery of their rollout plans as of November 2012. They also provided projected figures for smart meter installation up to 2019 (see figure 3). These projections are expected to change over the course of the programme as it is refined through the foundation stage e.g. when the DCC becomes operational. It is expected that activity across the country

38 DECC (2013a) Impact Assessment: Smart meter roll-out for the domestic and small and medium non-domestic sectors (GB). [Online] Available: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/78666/IA-Feb.pdf (Accessed: 21st Mar 2013)
39 Ofgem & DECC (2010) Smart Metering Implementation Programme: Prospectus. London: Office of Gas and Electricity Markets; Ofgem & DECC (2011) Smart Metering Implementation Programme: Response to Prospectus Consultation. London: Office of Gas and Electricity Markets
40 DECC, 2012a op.cit; Smart Reach (2012) Smart Metering for 'Hard to Reach' Rural Scotland. [Online] Available: http://smartreach.com/successful-smart-metering-trial-in-scotland/ (Accessed: 21st Mar 2013)
41 DECC, 2012f, op.cit;
42 DECC, 2012a, op. cit
43 Ofgem and DECC, 2011, op cit; Richards, 2012, op. cit.; DECC, 2012a, op. cit

will be ongoing from now until 2019, and the varying streams of work taking place in different locations at different times will provide an opportunity to share lessons learnt[44].

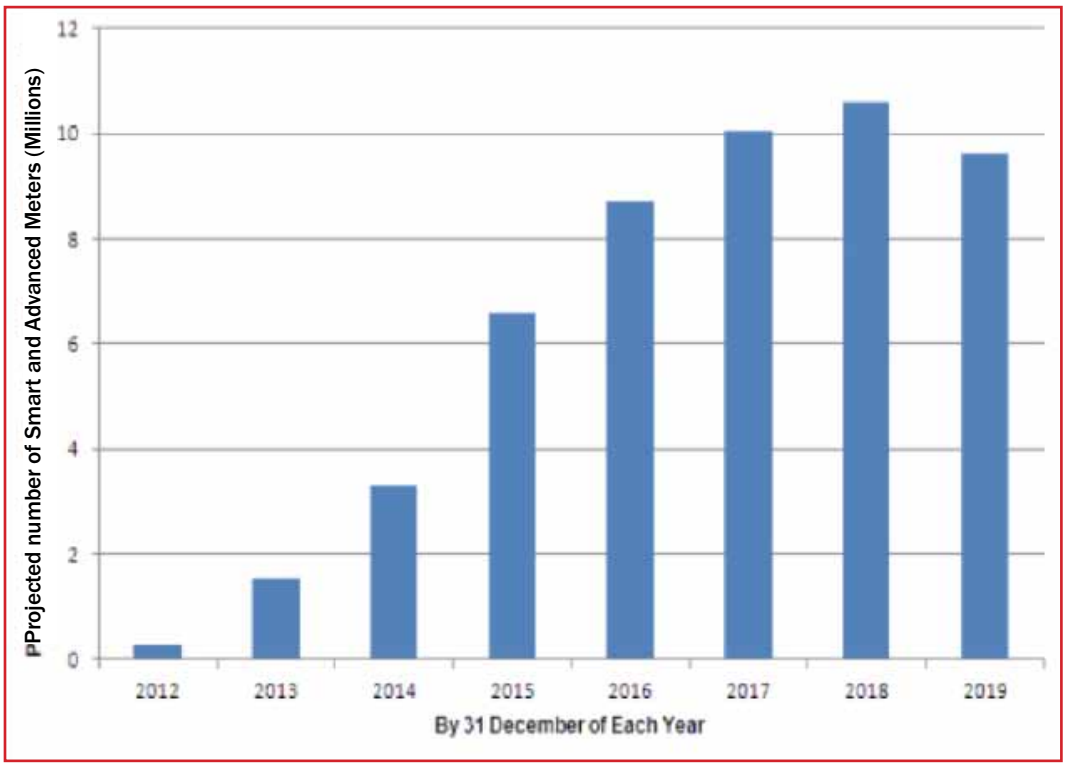


Fig. 3: Projections by larger energy suppliers for smart meter installation
(Source: DECC, 2012, First Annual Progress Report on the Roll-out of Smart Meters)

Costs of implementation

As part of their responsibility towards the delivery of smart meter systems across domestic and small non-domestic premises, energy suppliers are expected to bear the capital costs of the rollout; an estimated £650 million. The assumed average cost of the smart electricity and gas meters (rolled out at scale) is £44.95 and £59 respectively, with respective installation costs of £29 and £49. The installation cost falls to £68 if both meters are installed together[45]. It is planned that suppliers will recover the costs of the roll-out from customers, as they do when installing meters at present[46]. This will result in an initial rise in the average domestic consumer bill, peaking at a £7 increase in 2015, after which point consumers will start to see savings on their utility bills[47]. Table 3 details the financial impacts of the rollout on domestic and non-domestic consumers. In spite of this, concerns have been raised over issues of transparency in the reflection of the installation costs within the consumers' utility bills[48] and more generally whether savings will be passed on to the consumer. However, it should be noted that Energy Suppliers are not permitted by regulation to own and manage the assets themselves and many 'rent' meters from meter operators. Meters are an asset held by investors paying (roughly) a rate of return of 10%. This could be explored further as a way of reducing costs to customers.

44 DECC, 2012a, op.cit.
45 DECC, 2012a, op.cit; DECC (2013d) Smart Metering Implementation Programme: Smart Metering for Non-Domestic Customers. London: Department of Energy and Climate Change
46 Ofgem and DECC, 2011, op. cit; DECC, 2012a, op. cit; DECC 2013, op. cit.
47 Richards, 2012, op. cit; DECC, 2012b op. cit; DECC, 2012d, op. cit.
48 Public Accounts Committee (2012) Preparations for the roll-out of smart meters. [Online] Available: http://www.publications.parliament.uk/pa/cm201012/cmselect/cmpubacc/1617/161704.htm

Table 3: Consumer Impacts of Smart Meters
(Source: DECC, 2012, Impact Assessment: Smart meter rollout for the domestic sector; 2012, Impact Assessment: Smart meter roll-out for the non-domestic sector; 2013a, Impact Assessment: Smart meter roll-out for the domestic and small and medium non-domestic sectors).

Year	Residential Dual Fuel Bill Impact (£)	Non-Residential Dual Fuel Bill Impact (£)
2015	+7	-54
2020	-24 -	191
2025	-33	-214
2030	-39	-22

Customer Engagement

Suppliers will be expected to engage with customers before, during and after the installation to ensure the installation experience is as effective and efficient as possible, and provides maximum benefits to the consumers. Emphasis has been placed on addressing issues related to vulnerable and low income consumers, as well as leveraging consumer support during the rollout. To this end, the DECC[49] has produced a publication on the role of community groups within the implementation programme, as well as a study of vulnerable and low income communities[50].

Within the non-domestic sector, the parameters of the implementation programme are slightly different, with greater freedoms afforded. The use of 'advanced' or '1st generation' meters allowed as an alternative where they have been installed (or contracts have been put in place) before 2014. A substantial number of these meters have already been installed in the non-domestic sector[51]. Furthermore, the installation of the installation of IHDs will not be a requirement in the non-domestic sector. Significantly, non-domestic suppliers will have the option of whether or not to use the DCC. However, whether or not suppliers have opted in or out of the DCC, non-domestic users will still have the same minimum rights of access to data as those with advanced meters (half-hourly electricity or hourly gas data).

DECC in collaboration with Ofgem and Energy UK have produced a Code of Practice that will govern the installation of smart meters for both domestic and non-domestic premises. It is expected to come into effect in the Spring of 2013 will be governed by a Board including representatives of domestic and non-domestic suppliers and Consumer Focus, as the statutory consumer body[52].

49 DECC, 2013b, op. cit.
50 DECC 2012d, op. cit.
51 DECC, 2012a, op. cit.
52 DECC, 2013a, op. cit; 2013d, op. cit; Energy UK (2013) Smart Metering Installation Code of Practice. [Online] Available: http://www.energy-uk.org.uk/policy/smart-meters/-smart-metering-installation-code-of-practice.html (Accessed: 21st Mar 2013)

Facts and Figures: The Smart Meter Rollout at a Glance	
18.6 billion £££	Total amount estimated benefits during the next 20 years (approx) from installing smart meters in £s
11.5 billion £££	Total estimated cost of installing and operating smart meters in the period up to 2030 in £s
7.2 billion £££	Estimated net benefit by 2030 in £s
56 million £££	The Department of Energy and Climate Change's latest estimate of the budget for programme management and consumer engagement during the period 2011-12 to 2014-15 in £s
53 million 	Number of existing electricity and gas meter units to be replaced
30 million 	Number of homes and smaller non-domestic premises across Britain to have smart meters by 2019
11.2 million £££	Total cost of managing phase 1 of the smart metering programme in £s
10 million £££	Public spending on consumer trials of energy reduction using smart meters and existing meters in £s
100 	Proposed average number of full-time equivalent staff in the Department's smart metering programme management team from 2011-12 to 2014-15
25 £££	Estimated annual saving for the average dual fuel customer in Great Britain in 2020 in £s
7 £££	Estimated average increase in household bills by 2015 (at its peak) in £s

(National Audit Office, 2011, DECC Preparations for the roll-out of smart meters; DECC, 2012, Impact Assessment: Smart meter rollout for the domestic sector; DECC 2012, Impact Assessment: Smart meter roll-out for the non-domestic sector; DECC, 2012, Smart Metering Implementation Programme: Programme Update April 2012; DECC, 2013, Impact Assessment: Smart meter roll-out for the domestic and small and medium non-domestic sectors; Richards, 2012, House of Commons Standard Note: Smart Meters. London)

4 Opportunities, Benefits and Risks

The smart meter roll out involves opportunities, benefits and risks for the supplier, the consumer and for others, such as Government, for example in meeting their emissions targets, and in providing employment and training opportunities. For the consumer and the supplier, the risks and opportunities revolve around costs, as well as around energy consumption, customer rights and convenience, behavioural change and the operational challenges surrounding roll out and implementation. Some issues raise both an opportunity and benefit for one or both parties, others represent a potential opportunity for one and a risk for the other. Effective management of risk, protection of consumer rights and smart meter functionality appear to be key to the process.

Reduced Costs

Calculations undertaken by DECC indicate that overall, the roll-out of smart meters across the country could yield gross benefits of about £18.6 billion over the next 20 years (discounted at 3.5%). Based on an estimated programme cost of £11.3 billion, smart meters are expected to yield £7.3 billion in net benefits. This is however subject to some uncertainty on account of the assumptions used to calculate this, which include households maintaining reduced energy consumption for more than a year, and 97% of all households replacing their existing meters with smart meters[53].

Consumer opportunity/benefit

Reduced demand for energy, achieved through the provision of better information about energy use and prices, is identified as the greatest source of benefits and is expected to yield £6.2 billion in savings. The government believes that access to timely and accurate energy information can help households reduce their energy consumption and this is one of the reasons for the cost savings identified above. This has been partly validated by some of the field trials. One participant commented, “it’s not about cutting down, more a case of turning off what is unnecessary”[54].

A report published by Mott MacDonald in 2007 noted that international trials and experiences had demonstrated energy reductions ranging from 1% to 15%, subject to the implementation of smart meters[55]. These findings are not directly comparable with the UK however, where the studies are subject to different climate conditions and energy cultures. Furthermore, for reductions in single figures, it can be difficult to ascertain whether it is the smart meter that is actually causing an appreciable difference or some other factor, like climate, that will naturally vary in any pre and post-retrofit study.

The Government estimates that smart meters will contribute towards a 2.8% reduction in electricity consumption and 2.0% reduction in gas consumption, through encouraging consumers to modify their energy behaviour. This corresponds to an average bill saving

53 Ibid.
54 Smart Metering Implementation Programme – First Annual Progress Report on the Roll-out of Smart Meters, DECC, December 2012
55 Appraisal of Costs & Benefits of Smart Meter Roll Out Options – Final Report, Mott MacDonald, April 2007

of £23 per year by 2020, for a duel fuel customer[56].

Research undertaken by Consumer Focus identified four key factors which influenced the extent to which consumers modified their behaviour in response to smart meters:

i) perceptions of energy use prior to installation
ii) household structure
iii) financial situation
iv) interest/capacity to use the In-home display[57.]

The study was not long enough to indicate how long any behaviour change can or will be maintained. Due to the tight timescale associated with the smart meter roll-out, there is a lack of evidence indicating whether smart meters will contribute to prolonged or maintained behavioural change. The National Audit Office has highlighted that this poses a significant risk in terms of the realisation of the (already relatively small) net benefits calculated by the Government[58].

Supplier benefit

The elimination of home visits to obtain meter readings is the second largest cost saving (£3.4 billion), followed by reduced costs for suppliers to assist customers with switching energy suppliers (£1.7 billion)[59]. The accurate submission of meter data will also significantly reduce costs for energy suppliers where they no longer need to employ staff, or third party organisations, to collect meter readings.

Consumer risk and supplier opportunity – passing on savings

There is still uncertainty about whether these reduced costs will be passed on to the consumer in the form of reduced energy bills. The government is reliant on competition between meter manufacturers and energy suppliers to promote the development of new services and tariffs in an effort to attract customers.

Access to timely and accurate energy information

Consumer benefit and/or risk – peace of mind vs anxiety

A key functionality of smart meters is the capacity for two way communication between the meter and the energy supplier, facilitating the submission of regular and accurate meter readings. In addition to facilitating cost savings, a number of customers participating in smart meter trials indicated that automated readings provided peace of mind, in particular for those in vulnerable situations[60]; they no longer experienced the inconvenience associated with estimated bills, or the requirement to be at home for meter readings. However, there are concerns that smart meters may increase anxiety for consumers who are struggling with money, and may not be able to pay their energy

56 Smart Metering- what it means for Britain's homes, Ofgem, March 2011
57 Smart for All – Understanding consumer vulnerability during the experience of smart meter installation, RS Consulting, NEA and Consumer Focus, Nov 2012
58 Preparation for the roll-out of smart meters, National Audit Office, June 2011
59 Preparation for the roll-out of smart meters, National Audit Office, June 2011
60 Smart for All – Understanding consumer vulnerability during the experience of smart meter installation, RS Consulting, NEA and Consumer Focus, Nov 2012

bills. This may contribute to "self-rationing", where consumers reduce their energy consumption to levels which prove detrimental to their health and well-being[61]. One study noted that a number of participants reduced their heating (to as low as 12 oC in one instance) and another limited his television viewing to only the programs he most enjoys. Whilst the latter example of "self-rationing" may not be considered essential to one's well-being, it should be remembered that television can represent a means of engagement with current affairs for vulnerable individuals, in particular for those who live alone and rarely leave their home[62].

Supplier and consumer risk – data security

Security of data is a critical component with regards to consumer trust in the smart meter programme. The obligatory roll-out of smart meters in the Netherlands demonstrates an example where this was not sufficiently addressed, contributing to a lack of consumer trust in the programme. Therefore, this is not just about security of data but also the perception of security of that data.

The management of data collected via smart meters will be subject to the data protection act. The Government has confirmed the principal that customers will have control over who has access to their energy data and how it will be used, with the exception of data required for regulated duties to provide accurate energy bills. DECC has requested that energy suppliers draw up a "Privacy Charter", detailing how customers data will be protected[63.]

The Government will need to have an appropriate strategy in place in time for the mass roll-out, ensuring the system is not left vulnerable to security breaches, criminal cyber-attacks, or the accidental release, theft or misuse of personal data. The mitigation plan is still in development, but the government has been consulting with an established Security and Technical Experts Group to examine security issues and undertake a risk assessment[64].

Ease of switching suppliers

Opportunity for consumers, and for supplier competition

The Government envisages that smart meters will facilitate the switch between energy suppliers, allowing customers to shop around for the most competitive energy tariff. This is expected to yield an estimated £1.7 billion in benefits, relating to the reduced burden on energy suppliers to manage the switching process.

Ease of switching is not only critical to realising the full extent of the net benefits identified by DECC, but is necessary to ensure competition exists between energy suppliers.

As part of this project, we undertook a small sample of opinion from 29 tenants from two RSLs in Edinburgh and Aberdeen on their attitudes to smart meters. They were unanimous in their approval of the idea of smart meters, though only two had heard

61 Smart pre-payment in Great Britain, Gill Owen and Judith Ward, Sustainability First, March 2010
62 Smart for All – Understanding consumer vulnerability during the experience of smart meter installation, RS Consulting, NEA and Consumer Focus, Nov 2012
63 Preparation for the roll-out of smart meters, National Audit Office, June 2011
64 Ibid

of them beforehand. Most were happy to have one installed as long they were not presented with significant installation or switching costs. Most praised and trusted their housing provider, and were happy that they might become their chosen energy provider. A few expressed some scepticism, for example whether problems with paying for energy would impact on their tenancy[65].

Consumer and supplier risk – functionality and compatibility

Field trials have highlighted a number of issues regarding the compatibility and functionality of the smart meters upon switching energy suppliers[66] which raises risks that customers would be disadvantaged should they choose to change to a supplier from the one who installed the meter. This has necessitated modifications to the licence conditions for electricity and gas suppliers, with the aim of:

- Improving the information provided to customers with regard to the potential loss of advanced functionality upon switching energy suppliers
- Providing specific protection to customers with meters operating in prepayment mode
- Helping maintain the advanced capabilities of meters, or the accuracy of information stored in the meter, upon switching suppliers.

Energy suppliers within this market can still explore the provision of additional services and benefits beyond those required by a basic smart meter; this in fact will contribute to competition between energy suppliers. However, the licence conditions have been modified to ensure customers are fully aware of any loss in functionality that may be experienced if they switch.

Supplier risk - costs

The energy suppliers themselves have expressed a number of concerns regarding rental charges associated with the meter upon customers switching suppliers. First Utility highlighted that should the new supplier not have the capabilities to maintain the advanced functionality of the smart meter, the asset owner is at risk of not receiving the full smart rental charge. Ofgem have indicated that they hope to encourage the position where a smart rental charge will be the norm, and have therefore not proposed any regulatory framework to address this[67]. Whilst this issue may be resolved subject to the mass roll-out of smart meters, there is a risk that ADM's or early-installed smart meters may not be compatible with some energy suppliers, consequently restricting customer's options for the interim period.

Tariffs

The capacity for smart meters to send and receive data means energy suppliers have the potential to directly communicate energy cost information straight to the household. This can be used by the customer to ensure they are on the best tariff available from their current supplier, but they may have to actively pursue information about services offered by competitors.

65 Robert Gordon University, April 2013, op. cit.
66 Supporting effective switching for domestic customers with smart meters: Modification of supply licence standard conditions, Ofgem, August 2012
67 Ibid.

Potential consumer benefit and/or risk – competition and tariffs

The government anticipates that the ease of switching between suppliers should create increased competition, consequently driving down energy tariffs. For this reason, no regulations have been developed which stipulate that cost savings realised by the energy supplier, through the installation of smart meters, should be passed on to the customers. There is a risk that the different energy suppliers may pursue similar pricing strategies; this could result in the installers and suppliers making a profit from the installation of smart meters if there is no transparency about any increases in costs[68].

Consumer benefits and opportunities – time of use (TOU) tariffs

The introduction of smart meters, and the development of the smart grid, means a range of new products and services can be offered by energy companies, including 'time of use' (TOU) tariffs. Households will be encouraged to modify their behaviour through financial incentives, with cheaper electricity offered at periods of low demand, or when there is high generation output from low carbon resources. This potentially means that patterns of consumption may become more important than the amount of consumption.

DECC estimates that by encouraging consumers to shift their energy consumption to off-peak times, £916 million can be saved through cheaper energy generation and better management of the electricity network. This value is based on the assumption that 20% of households will shift 10% of their energy consumption[69].

Research on the impact of TOU tariffs is as yet unclear, though it seems they could offer a significant opportunity. Research in the US indicates that TOU tariffs have yielded significant benefits for low income households[70]. However, research by Ofgem suggests otherwise: they observed that low-income households struggled to decipher complex tariffs, and were more susceptible to making inappropriate decisions about which tariff best suited their energy usage[71]. Consumer Focus highlighted that vulnerable households which have literacy and numeracy problems experienced considerable difficulties trying to comprehend the different tariff options[72].

International studies have indicated that consumers have the capacity to shift between 6% and 25% of their peak demand energy use to an off-peak time, though these results are not directly comparable to a UK climate and energy culture. Homes with storage heating are likely to experience greater benefits from TOU tariffs. Non-heating technologies/appliances (such as washing machines, dishwashers etc.) only account for a small percentage of the peak load – approximately 5-6%73. These can be more difficult to shift to periods of low demand as, for example, at night time their use may be constrained by noise concerns, or consumers may not wish to leave their washing in the machine for a number of hours if they use a time delay programme.

68 Preparation for the roll-out of smart meters, National Audit Office, June 2011
69 Ibid.
70 Appraisal of Costs & Benefits of Smart Meter Roll Out Options – Final Report, Mott MacDonald, April 2007
71 The Retail Market Review – Findings and initial proposals, Ofgem, March 2011
72 Smart for All – Understanding consumer vulnerability during the experience of smart meter installation, RS Consulting, NEA and Consumer Focus, Nov 2012
73 Appraisal of Costs & Benefits of Smart Meter Roll Out Options – Final Report, Mott MacDonald, April 2007

The assumptions used in calculations by Mott MacDonald are slightly less optimistic than DECC's. He considers an average reduction in peak load of 1%, based on 20% of homes shifting 5% of their peak energy use[74]. This highlights the uncertainty associated with the customer uptake of TOU tariffs, and the extent and frequency with which consumers will modify their behaviour. He raises the point that energy efficiency will also help reduce peak demand, for example, a low energy light will use less energy regardless of what time it is used. As an alternative to TOU tariffs, he suggests that automated load management, using tele-switches to control appliances such as fridges and freezers, can offer a more valuable contribution to peak load management.

No upfront costs – payment over time

Consumer benefit

A key conclusion drawn from DECC's consultations is that the installation of smart meters and IHD's should not incur upfront costs for the customer. This requirement has been integrated within the licence conditions, with the intention that costs are recouped over time through customer's energy bills[75].

Consumer risk

There is a concern that vulnerable customers may be disadvantaged by the mass roll-out of smart meters, because they are less likely to benefit from reduced energy consumption as they are already low energy users, but will still need to contribute towards costs via their energy bills. These customers will be reliant on reduced tariffs and better services resulting from the mass roll-out, and increased competition between suppliers to realise any benefits.

Customer engagement in smart meter roll-out and implementation

Supplier opportunity and risk

The estimated £7.3 billion net benefits resulting from the roll-out of smart meters assumes that the technology will be installed in 97% of homes across the country[76]. Positive consumer response to the installation and operation of smart meters will be critical to ensuring this target can be met. Ofgem have been assigned responsibility to manage and enforce the 'Codes of Practice' developed by the energy suppliers. These are to provide protection for customers during the installation process, and facilitate long term reductions in energy use. There is also an expectation that energy suppliers will obtain feedback on customer's experiences, to further inform and refine the installation process[77].

E.ON and British Gas have participated in trials during the foundation stage which adopted very different approaches in terms of engaging with the customer and installing the smart meter: the former issued information about the benefits of smart meters

74 Ibid.
75 Licence conditions for a code of practice for the installation of smart electricity and gas meters – Government response to consultation, DECC, April 2012
76 Preparation for the roll-out of smart meters, National Audit Office, June 2011
77 Licence conditions for a code of practice for the installation of smart electricity and gas meters – Government response to consultation, DECC, April 2012

and customers could 'opt in' to have one installed; the latter targeted customers due to receive an 'end of life meter exchange' and replaced these with smart meters. The study noted that the British Gas customers were generally less engaged with the smart meter, compared to the customers who had 'opted-in' with E.ON. The British Gas customers were also unable to identify as many benefits associated with the smart meter technology[78].

The ability to 'opt-out' of having a smart meter installed has an important role in terms of consumer trust and willingness to engage with the technology. In the Netherlands, the Dutch government placed a legal obligation on consumers to install smart meters in their homes. This resulted in a public backlash, relating to privacy and data concerns, and brought a halt to the programme[79.]

These examples emphasise the importance of a positive introduction to the smart meter roll-out, where this will be critical to the programme's overall success.

Smart technology and functionality

Potential supplier risk

It is estimated that about five million ADM's will have been installed prior to the mass roll-out of smart meters in 2014[80]. It may be necessary to replace some of these meters, should they not meet compliance with the final smart meter technical specifications, however a cost associated with upgrading these meters (£65 million) has been accounted for within the £11.3 billion roll-out cost[81].

Despite the beginning of the programme running behind schedule, DECC pushed forward the completion date of the mandated roll-out by a year, from 2020 to 2019. This presents a five year window within which 53 million smart meters needs to be installed in 30 million homes and small non-domestic premises. This represents a tight and intense programme for the introduction of a new technology, where the technical requirements and specifications may still be subject to change. Smart meters are assumed to have a typical life span of about 15 years; however, the rate of technology development may render some meters obsolete within the timeframe of the roll-out[82].

Potential consumer risk

Smart meters use the mobile phone network to communicate information between the meter and energy suppliers, and this may present concerns for some people about the impact on occupant health. DECC need to clearly demonstrate that smart meters and associated equipment comply with the necessary standards determined by the Department of Health for wireless communication technologies[83].

78 Smart for All – Understanding consumer vulnerability during the experience of smart meter installation, RS Consulting, NEA and Consumer Focus, Nov 2012
79 Preparation for the roll-out of smart meters, National Audit Office, June 2011
80 Supporting effective switching for domestic customers with smart meters: Modification of supply licence standard conditions, Ofgem, August 2012
81 Preparation for the roll-out of smart meters, National Audit Office, June 2011
82 Appraisal of Costs & Benefits of Smart Meter Roll Out Options – Final Report, Mott MacDonald, April 2007
83 Preparation for the roll-out of smart meters, National Audit Office, June 2011

Development of licence conditions to protect customers

Potential consumer benefit and risk

As indicated, there have been a number of consultations to inform the development of licence conditions for the installation of smart meters. This has resulted in the agreement of overarching objectives, which focus on: standards of conduct and service; fair and transparent behaviour; accuracy and completeness of information provided; and the avoidance of unwelcome sales and marketing activities during the installation visit[84].

Each energy supplier is required to develop their own "Code of Practice" for submission to Ofgem, who will either approve it, specify modifications, or if considered unsatisfactory designate another code in its place[85]. The overarching objectives must be addressed by the content of the "Code of Practice", alongside more detailed requirements relating to key areas, such as the provision of energy efficiency advice; not charging customers up-front for the installation of the smart meters or in-homes displays (IHD); identifying and meeting the needs of more vulnerable customers; and sales and marketing activities[86].
Consumer protection will in part depend on proper regulation of suppliers and their codes of practice.

5 Focus on Prepayment Facilities - particular risks, benefits and opportunities

Background

The number of prepayment meters has been rising considerably over recent years: in 2012 there were around 4.2 million and 3 million electricity and gas prepayment meters respectively, which corresponds to a 4% and 7% increase from the previous year. Prepayment meters are not exclusive to low-income and vulnerable customers, but they comprise a significant proportion of the customer stock[87].This does not have to be the case, as demonstrated by the pre-payment meter system established in Northern Ireland, which is discussed in more detail below.

While pre-payment meters should ensure that a household will not accumulate a large debt due to non-payment of energy they have, in the past, been controversial due to the slightly higher energy tariffs involved with their use. As they are more likely to be found in lower-income dwellings, the fairness of their use has been questioned. Self-disconnection is a key concern of prepayment customers, though the rates at which these occur have been falling since 2007.

84 Licence conditions for a code of practice for the installation of smart electricity and gas meters – Government response to consultation, DECC, April 2012
85 Ibid.
86 Ibid.
87 Smart pre-payment in Great Britain, Gill Owen and Judith Ward, Sustainability First, March 2010

Table 4 details the number of disconnection rates for the first two quarters of 2012, and compares these against the first two quarters for the previous year. This shows 63% fewer electricity disconnections and 77% fewer gas disconnections in Q2 of 2012 compared to Q2 of 2011 (it must be noted that disconnections are seasonal, hence the increase for the second quarter, because suppliers are required to avoid disconnections for vulnerable customers during winter months) [88].

	Q1 2011	Q2 2011	Q1 2012	Q2 2012
Electricity	44	375	13	138
Gas	20	146	2	33

Table 4 Prepayment Disconnection

There are particu ar risks, opportunities and benefits that arise from the introduction of smart meters operating in prepayment mode. Smart meters, and the introduction of new administration processes, could potentially provide a number of new functionalities for pre-payment meters which address current limitations:

- methods of adding credit
- cost, and
- options to reduce self-disconnection[89].

The opportunities for smart meters to be of benefit to pre-payment meter customers comes with the second round of smart meters – known as SMETS 2. It is this specification which will include multiple payment options and the ability to switch between credit and prepayment. However, the specifications for SMET2 has not yet been settled and is expected to happen later in 2013[90]. Until this has happened, it is impossible to review and recommend particular meters or compare functionality.

We can, however, identify theanticipated risks, benefits and opportunities for prepayment customers, and these are listed below..

Costs

Consumer risk: as with smart meters generally, the cost of the technology involved will be passed on to customers making smart meters more expensive to them. In addition, it has been suggested that costs will discourage suppliers from rolling out smart meters to pre-pay customers, and that for years suppliers will be supporting smart and standard prepay meters technology with associated costs[91].

More competitive tariffs

Consumer benefit: previously, customers on a prepayment tariff have had fewer options, and there has been little competition between suppliers. A significant advantage of smart meters within the pre-payment market is the potential to reduce

88 Domestic suppliers' quarterly social obligation data – Quarters 1 and 2 2012, Ofgem, December 2012
89 Smart pre-payment in Great Britain, Gill Owen and Judith Ward, Sustainability First, March 2010
90https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42953/6129-consultation-second-version-smets.pdf
91 Consumer Focus and Accenture, April 2013, op. cit.

the cost differential which currently exists between credit and prepayment tariffs. This will be achieved for a number of reasons, including:

- Common meters eliminating the need for more expensive specialised pre-payment meters, or expenses associated with the replacement process
- Where smart meters require the updating of administrative services, it's likely that there will be less differentiation between the different systems,
- If the number of pre-pay tariff increases, any associated costs can be spread out over a larger customer base.

Consumer risk: there will be a number of areas within the prepayment market which incur additional costs in comparison to the standard credit meter system (see also below). Any reductions in tariffs will therefore be reliant on the competition between suppliers. As already indicated, transparency about any cost increases may be necessary to ensure that the smart meter roll-out is not used as an opportunity for profit by the energy suppliers.

Increased number of pre-payment options

Consumer benefit: in the future it may be possible to top-up credit at a range of locations, including ATM's and supermarket checkouts. As the pre-pay market grows, it will become more cost effective for suppliers to provide a wider range of credit top-up methods. A number of alternative and innovative options are being considered. Mobile phone operators are looking at the possibility of transferring money from a cash-top-up mobile phone balance to pay for energy. Alternatively, gas or energy suppliers may administer electronic cash cards that can be used to pay for credit.

The range of pre-payment options offered is likely to expand significantly. Pre-payment has become standard across a range of sectors: pay-as-you-go mobile tariffs represent over 60% of mobile phone contracts in the UK; Oyster cards allow advanced and more favourable payment for public transport in London; payment cards are increasingly becoming available for travellers abroad (in place of travellers cheques) and for parents administering a budget to their children for shopping online[92].

In Northern Ireland a pay-as-you-go utility scheme, using a 'Liberty Keypad meter', has successfully provided a mainstream way to make energy payments. This has made it more convenient and removed the stigma associated with prepayment meters. By mid-2009 30% of all utility customers in Northern Ireland were using the keypad prepayment meters, with new connections continuing at a rate of 2,000 per month. Fifty- eight percent of customers are on low-incomes, but a significant proportion (32%) are on middle-or higher incomes. The increased convenience has been key to its success, though other factors have contributed including discounted tariffs and "friendly credit" which helps avoid disconnection[93].

Consumer risk: an obstacle to this approach is that not all customers have access to a debit card which is needed for the majority of pre-payment methods. This would be felt acutely amongst the more vulnerable households, where 7-12% of low-income households do not have a bank account, and others may only have limited ability debit cards[94].

92 Smart pre-payment in Great Britain, Gill Owen and Judith Ward, Sustainability First, March 2010
93 Ibid.
94 Ibid.

In addition, there may be additional costs associated with the management of such systems. Incentives may be used to encourage customers to top up less frequently with larger sums of money, which would help reduce the administrative burden. This, again, might place vulnerable customers at a disadvantage, where it is not practical or they may not have the means to top up their credit[95].

Switching between credit and pre-payment modes

Potential consumer and supplier risk and benefit - functionality: the smart meter specification developed by the Energy Retail Association suggests that all smart meters feature a function allowing them to be remotely switched between credit and pre-payment modes[96]. At the time the report was published (March 2010), the government had not fully committed to this criterion, though the key advantage would be that meters would not need to be replaced. This would make it easier to switch between credit and prepayment operation. However in the pre-payment mode the smart meter would need to maintain additional information about credit available, and deduct costs in relation to ongoing energy consumption. Ovo Energy have expressed concerns about the capacity of the ADMs installed during the foundation stage to do this[97].

Risk to consumer protection: with smart meters, energy companies will no longer need to visit a customer's home to switch the meter. This will result in the loss of an important consumer safeguard to check that prepayment is appropriate for the customer, to demonstrate how the meter works and provide a point for the exchange of other information[98] This is perhaps a particular risk where it is the supplier who is seeking to switch the consumer to prepay. Currently, energy suppliers offer pre-payment to customers who cannot maintain another payment arrangement and this is increasingly becoming the reason behind the majority of switches: 90% of prepayment meters installed in 2011 were due to debt, compared to just 40% of installations in 2002[99]. Currently, to undertake the switch from a credit meter to a prepayment meter, the supplier must gain access to the flat for the installation. Should they be refused access, the supplier must obtain a warrant from the magistrates court, to either install the meter or disconnect the supply. Smart meters will eliminate the need to obtain a warrant for access, but this also eliminates the process which currently exists to protect the customer. Protection in the form of a combination of voluntary codes, guidance and formal licence conditions have been introduced to protect against this. The supply licence conditions, governing debt recovery and disconnections, as well as the Energy Retail Association protocol, are designed to minimise or prevent disconnections in the case of vulnerable households.

Disconnection and Self-Disconnection

Self-disconnection occurs to reduce debt or avoid debt which could build up when credit is exhausted, and may happen for a number of reasons:

95 Smart pre-payment in Great Britain, Gill Owen and Judith Ward, Sustainability First, March 2010; Smart Metering Perpayent in Great Britain, Consumer Focus and Accenture, April 2013
96 Ibid.
97 Supporting effective switching for domestic customers with smart meters: Modification of supply licence standard conditions, Ofgem, August 2012 98 Consumer Focus and Accenture, April 2013, op. cit.
99 Domestic suppliers' social obligation: 2011 annual report, Ofgem, October 2012

- the household may have "forgotten" to top up, or
- experienced practical difficulties in doing so, or
- do not have the resources.

There are currently a number of approaches used by energy suppliers in this scenario:

- Suppliers provide customers with emergency top-up credit, typically in the region of £5.
- A "no disconnection" policy applied in the evenings allows customers to continue using energy which is deducted from the next top-up (at no extra cost).

Consumer opportunity: experience in Northern Ireland noted that limiting the periods of disconnection made pre-payment a much more attractive option. This was described as "friendly credit", where customer's energy supply would not be disconnected between 4pm – 8am, and all day Saturday and Sunday[100].

Consumer and supplier risk: the smaller energy suppliers account for a significant proportion of the disconnections which currently occur. Ofgem have also noted that the five highest average electricity debts are owed to small suppliers, and have stated an intention to discuss this further with the corresponding suppliers to determine why this is the case[101].

Functionality

Consumer risk: as indicated in the discussion of the Foundation Stage above, by the end of September 2012 over 623,000 smart-type meters had been rolled out by the large suppliers, of which only 300 were SMETS compliant. A report from Consumer Focus and Accenture[102] indicates that full interoperability will not be in place until the DCC is operational in 2014 at the earliest. Before this date, most smart prepayment customers who switch suppliers will in practice have their meter replaced unless a short-term, interoperable solution is implemented. Changing meters could involve customer inconvenience, loss of smart functioning and cost.

Consumer risk: smart prepayment will be dependent on remote functionality, the DCC infrastructure and suppliers' selected solutions. Failed vends could occur for a number of reasons from communications failure could result, for example, from bad weather or peaks in demand. Customers must still be able to easily top-up when problems arise, otherwise an increased number of customers could be left off supply. There is also a risk in such circumstances that the customer will have to wait longer in the shop for payment confirmation than they do today.

Consumer risk: in a smart world, real-time validation of customers against their supplier and supply point (customer premise) is likely to take place. This could mean that if customers have the wrong number, the payment will either be rejected at the point of sale or customers could top-up the wrong meter. In both instances customers could be left without supply.

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100 Ibid.
101 Domestic suppliers' quarterly social obligation data – Quarters 1 and 2 2012, Ofgem, December 2012
102 Ibid.

Meter Location

Consumer risk and opportunity: the location of the smart meter needs to support customer interaction. This is particularly important for prepay customers, but should be observed in all installations as customers may switch to prepay in the future.

Customer Engagement

Consumer risk and opportunity In their report[103], Consumer Focus and Accenture highlight the need for greater emphasis on the customer experience during Foundation stage to ensure that the benefits of smart metering for prepay customers are realised, They outline distinct challenges linked to early rollout, which we outline above. The report sets out service and management recommendations with the aim of ensuring that prepay customers are not disadvantaged by the introduction of smart meters.

6 Employment and training opportunities for meter installation and management

In the research for this workstream, a review of employment and training opportunities was undertaken in order to give an overview of the opportunities provided by smart meter roll out. These could be significant. As indicated, 53 million smart meters (gas and electricity) will be installed in Great Britain by 2019. This presents opportunities in terms of investment and job creation for both meter installation and management, including meter reading. It should be noted that the regulatory requirements specify that the roles of meter installation and management, including meter reading, must be separate from the supply company, however, a number of utilities are 'in-sourcing' through subsidiary organisations.

The National Skills Academy for Power (NSAP) has estimated that by 2017 at least 6,000 meter installers will be required. However, the final peak requirement for the roll-out may reach 10,000 people (three times existing levels), including extra support staff (for example on distribution networks)[104].

Training is available for certificated qualifications. An indicative cost is approximately £3-4,500+VAT per delegate for a 10-week full time course covering gas and electrical safety competence relating to the installation, exchange and removal of domestic gas and electricity smart meters. It should be

noted that funding is available for these courses where participants are in receipt of job seekers allowance and employment support allowance. Job Centre Plus

103 Ibid.

guidelines state that training can only cover 16 hours per week but there does seem to be some local flexibility on this. In addition to the above training, there are accreditation courses for meter reading[105].

7 The opportunities and implications for an RSL ESsCo

The roll out of smart meters presents a unique opportunity for a new ESsCO. Timing on the roll-out of 2nd generation meters, which will allow for a vastly improved service to PPM customers, could not be better and the meters be beneficial to a potentially wider range of customers where the tariff was competitive as has been seen by the Northern Ireland experience. With the specification for 2nd generation meters expected to be finalised in 2013 and roll-out from 2014, it would be possible to enter the market in a controlled way prior to mass roll-out and then to implement at scale once the new Co's teeth had been cut under a business as usual model. As mentioned above, current UK Government consultation with industry on implementation has indicated that there is no appetite from the 'Big 6' to prioritise vulnerable customers and this could present a market advantage to a new ESsCo.

While there will be risks for both consumers and suppliers associated with the roll out of smart meters across the Great Britain, for an RSL ESsCo focussed on the provision of affordable energy from renewable sources, the opportunities for both parties outweigh the risks. With effective identification and management of the risks, the consumer and supplier stand to reap significant benefits in reduced costs and increased convenience. In addition, there are training and employment opportunities now and in the future.

Key factors that the ESsCo would need to consider in setting up are:

- Customer engagement and information, with a focus on vulnerable customers, this could be facilitated by RSL links with the communities that they serve
- Maintaining customer focus throughout set up and operation
- Offering competitive tariffs, which should arise from the ESsCo structure, while maintaining supplier profitability
- Making full use of the opportunities raised by TOU tariffs, particularly those that arise from supply from renewable sources, while exploring options for automated load management and energy efficiency methods
- Providing a range of appropriate top-up methods for prepayment customers and particularly maintaining a focus on 'unbanked' customers
- Exploring options for the provision of "friendly credit" and other ways of reducing "self-disconnects"

104 http://data.parliament.uk/writtenevidence/WrittenEvidence.svc/EvidencePdf/387
105 http://www.nutechtraining.co.uk/news/bglobal-launches-training-academy-to-upskill-local-community/ http://www.nutechtraining.co.uk/wp-content/uploads/2012/08/TC2162-NuTech-A5-Folder-Pack_Inserts_Online.pdf

Appendix 1

Part of the scoping research for this workstream involved identifyingf the pattern of distribution network operator charges across Scotland and strategies for minimising costs or facilitating understanding where these charges are unavoidable (e.g. in the case of rural customers).

Below is an explanation of how these costs are set and confirms that they are unavoidable. The full breakdown of costs for Great Britain is included.

Ofgem (Office of Gas and Electricity Markets) regulates and has price control mechanisms that restrict the amount and type of revenue that can be earned by regulated businesses which include electricity transmission and distribution. The

National Grid Electricity Transmission plc (NGET) operates the National Grid and recoups its costs by Transmission Use of System (TNUoS) charges on the users of the system and it splits the costs between the generators and users of electricity.

Transmission charges Transmission charges are paid to National Grid to cover the expense of running the grid , either charged as TRIAD Triad demand is measured as the average demand on the system over three half hours between November and February (inclusive) in a financial year;they comprise the half hour of system demand peak and the two other half hours of highest system demand which are separated from system demand peak and each other by at least ten days;these half hours of peak demand are usually referred to as Triads) for large levels of demand, or based on usage between 4pm and 7pm for smaller demand levels. The charge for a supply is calculated at the end of the financial year by taking an average of the Grid Supply Point (GSP) kW at each of the three TRIAD times, and multiplying it by the set rate (which varies by district network operator (DNO).

Distribution charges
The distribution charges, known as the "distribution use of system" (DUoS) charges, are paid to the distribution network operator (DNO) on whose network the meter point is located.

Tariffs are set annually by NGET, and are zonal in nature—that is, the country is divided up into different zones, each with a different tariff for generation and consumption. In general, tariffs are higher for generators in the north and consumers in the south. This is because there is currently a north-south flow of electricity, and the additional stresses on the system increasing demand in areas of currently high demand causes.

Although these are the main source of income which the National Grid uses to cover its costs, it also charges an annual fee to cover the cost of generators, distribution networks and large industrial users connecting.

Legal framework

Clyde Valley Housing Association

Clyde Valley Housing Association

Chapter Summary

The purpose of this paper is to assess the legal structure and ownership options, associated with the proposal to establish an ESsCo as described in the Foreword.

Analysis of 'what is wanted' indicates that there is alignment of opinion between the RSLs, their low-income tenants and RPE in respect of what a new energy supply company should do. Primarily these key stakeholders want to see a more affordable cost of energy being passed to low-income tenants and for it to be delivered by a 'social enterprise type' entity. Although there are minor nuanced differences of opinion between some of the RSLs around secondary goals in respect of financial and renewable energy strategies, the congruity of opinion about what is wanted should enable 'Founding Principles' of the new organisation to be developed. These will inherently define the 'character' of a new company and should give it a 'clarity of mission'. These 'Founding Principles' will not only act as a guide in the process of identifying an appropriate legal structure, but also be a key driver as to the organisation's future direction and operation.

Having a robust and practical financing strategy in place will enable an organisation to focus on achieving its goals. Good business planning should enable it to identify an optimal financing strategy. This should understand what levels of finance are needed, for what purpose and then match these needs to appropriate funding sources and to a timetable that ties in with its plans. In the case of a potential new ESsCo, initial forecasting predicts that in a planned start-up growth scenario, finance will be needed to support early stage unfunded overheads and working capital needs, with a specific identified need to cover future energy purchases/guarantees. Should generation opportunities be followed, then capital expenditures and potential development costs need also to be funded.

There are various standard types of legal form that could be adopted. However, it is recommended that in creating a new business, the formation of the legal structure should be self determined and not 'shoe-horned' into a standard form. Instead close reference to 'Founding Principles', finance and other requirements, should inform a bespoke legal design process that will produce an enabling structure for the potential organisation to meet its future aims.

Building on the analysis undertaken, a new ESsCo should be established with social goals alongside conventional financial targets and as such will need to ensure that its social mandate is protected and is central to the future development of the business. A governance structure should be set-up that involves a balanced representation between the main stakeholders and expert non-executives. Clear founding principles with secondary and tertiary objectives should be put in place, both as guides for future decision making, but also benchmarks for the organisation, at all levels, to measure itself against. These should be captured in a comprehensive business plan, that will act as the blueprint for agreed plans and act as both a unifying document, and as a reference for performance against agreed targets, both social and conventional.

Where subsidiary activities are aligned to the overall organisation's aims, the venture should not be adverse to profit maximising, so that surpluses can be 'recycled' and used to support the main activities of the organisation. Tax advice should further be sought when a chosen business model is settled on, as ensuring an organisation has efficient tax planning in place will again maximise retained earnings for the purposes of achieving the organisation's aims. Although there are numerous risks and threats associated with launching and running a start-up company, key pitfalls to be avoided, in respect of a chosen legal form centre around ensuring current and future financing needs can be met, governance structures are efficiently set-up and the social aims of the organisation have adequate legal protection.

To achieve a desired legal structure, a logical process is recommended, whereby: key stakeholders agree on 'Founding Principles'; a business model be undertaken and that this and the 'Founding Principles' be the main pillars of a business plan that is developed; the business plan should ensure all aspects of the new business launch and ongoing operation are considered, including start-up and future financing, governance structures, tax planning, mission protection and adoption of chosen legal form; the business planning will be an iterative process and should include involvement and buy-in from all key stakeholders. Once completed, the business plan will be the key tool used for raising necessary finance, guiding the governance function and setting targets for the executive to launch the business. The chosen legal structure can then be set-up and from this the business finally launched.

1 Purpose of paper & approach

The purpose of this paper is to assess the legal structure and ownership options, associated with the proposal to establish an ESsCo as described in the Foreword.

The approach taken has been to consider the following:

- Understand the needs and desires of the identified key stakeholders - being the RSLs, their low income tenants and the Renewable Power Exchange (RPE);
- Identify key financing needs and ensuring these are provided for in a future legal structure;
- Different legal structures available for adoption;
- Consider the efficiency of legal structure - balancing the needs for mission protection and good governance;
- Consider other points pertinent to the setting out a legal framework and highlight key risks and threats;
- Given the above map out a suggested future process

The preparation of this paper has been informed by the author's own, and RPE's experience in alternative business structures and by reference to: direct interviews with the RSLs; targeted desk research on low-income energy users; and specialist support from tax and legal experts on points of detail.

2 What is Wanted

Overview

The analysis detailed below indicates that there is alignment of opinion between the RSLs, their low-income tenants and RPE in respect of what a new energy supply company should do. Primarily these key stakeholders want to see a more affordable cost of energy being passed to low-income tenants and the RSLs and RPE would like to see it delivered by a 'social enterprise type' entity. There are minor nuanced differences of opinion between some of the RSLs around secondary goals in respect of financial and renewable energy strategies, however these are not deemed prohibitive in nature and should be easily resolved.

This congruity of opinion about what the key stakeholders want to achieve should enable 'Founding Principles' of the organisation to be developed. These will inherently mark down the 'character' of a new company and give it a 'clarity of mission'. These 'Founding Principles' will not only act as a guide in the process of identifying an appropriate legal structure, but also be a key driver as to the organisation's future direction and operation.

Stakeholder Feedback

The following section provides feedback from the RSLs, their low income tenants and RPE. Understanding what is wanted by each of these groups will guide the future legal form of the new entity:

RSL Feedback:

The RSLs were consulted and key feedback is summarised below:

- **Affordability of energy to customers is the key driver**
  - The key driver for RSLs in this project is to ensure that energy, for both power and heat (electricity and gas), is made available to their tenants at an 'affordable' and 'fair' price;
  - They view that this aim can be achieved by addressing the overall cost of energy on a number of levels:
    - the actual price charged for energy;
    - the payment mechanic - ensuring that customers are not being unfairly penalised by virtue of their payment method (eg. prepayment meter charges);
    - supporting the efficient use of energy by tenants, thus inherently reducing costs incurred.

- **RSL involvement**
  - From a governance perspective the RSLs were unanimous in wanting to be involved, in a practical way, in ensuring that initial plans and aims are followed and the underlying mission protected;
  - From an operational perspective, again there was a consensus that RSLs would be open to supporting/being involved, as long as any engagement was viewed as the most efficient solution for the new ESsCo, and any

involvement didn't breach charitable legal guidelines.

- **Renewable energy**
  - All RSLs expressed the view that achieving any renewable energy goals should be secondary to the primary goal of addressing energy affordability;
  - However some RSLs were more enthusiastic about taking on renewable energy as a secondary objective.

- **Scale of operation**
  - In general there was not opposition for the operation to grow in scale;
  - However a pragmatic view was unanimously expressed: that 'getting it right' should be the focus and only once the concept proven, then scale could be considered;
  - Some also re-iterated that any pursuit of scale should not be at the expense of any agreed founding social principles.

- **Financial**
  - There was a general view that the new entity should be a 'social enterprise' in nature, making 'affordability of energy' a key measure of its success;
  - However there was a spectrum of opinion in respect of the potential financial structure that could deliver this:
    Some preferred a 'pure' social enterprise - not profit maximising - but 'financially self-sustaining' - maintaining a strong reserve;
    Whilst others preferred a more commercial entity that could also deliver financial returns back to RSL founder investors.

- **Structure**
  - The question of suggested structure reflected the feedback on the financial aspect, detailed in the point above:
    All parties reflected a preference for a 'social enterprise' type organisation - delivering on the energy affordability driver;
    However suggestions on the type of structure preferred, ranged from a 'pure' non-profit, to a fully 'commercial' entity.

- **Approach to project**
  - There were 2 key lines of very pragmatic advice unanimously fed-back in respect of how this project be approached:
    That any start-up should be meticulously planned and launched in a staged manner - "not running before you can walk" was a repeated message;
    That the project only be pursued if there is forecast impact on the affordability of energy to low-income tenants. In other words, it should not be a 'trophy' energy company.

Low-Income Consumer Perspective

The perspective of low-income consumers has been furnished from 2 sources: (1) the 'Payment Methods - Workstream A' part of this 'Warm Homes Fund' series of papers; and (2) a 2010 report delivered by Consumer Focus on Prepayment Meters[9]. The key findings in respect of a low-income energy customer's needs and desires are as follows:

9 Cutting back, cutting down, cutting off - Self-disconnection among prepayment meter users - Hannah Mummery, Holly Reilly for Consumer Focus

business model.

- **Structure**
  - RPE expects a social enterprise model to be the most appropriate to house a new business, however is not tied to any legal form, and will adopt any structure that delivers on the core aim of addressing fuel poverty and secondary aim of promoting renewable energy.

Clarity of mission

Should the proposal to develop a new ESsCo be followed, there will be a need to clearly define what the new company wants to do. The above summaries of what are viewed as priorities by the key stakeholders will enable 'Founding Principles' and more detailed objectives to be laid down.

A brief analysis of the above indicates that:

- Low-income consumers want lower tariff charges, that they can control and pay more easily;
- In respect of the RSLs:
  - They are unanimously aligned in wanting to offer their tenants an 'affordable' cost of energy through a 'social enterprise' type entity and also take a pragmatic approach to any new business launch;
  - However there are some nuanced differences expressed, in respect of the financial drivers (profit distributing or not) and a varying level of enthusiasm behind potential renewable energy links.
- RPE has a stated goal of addressing fuel poverty in the UK, and where it is aligned with this goal it also would include renewable energy as a central part of a new ESsCo's business model.

In respect of the main drivers there appears to be congruity of opinion between the RSLs, their low-income tenants and RPE on what a new company should do. And although some differences are noted between RSLs, these would appear to be minor in nature and with a 'middle ground' achievable. Additionally the potential to incorporate renewable generation as part of the business model requires further consideration and should be settled as part of the secondary aims of the ESsCo.

Developing agreed 'Founding Principles' will inherently define the 'character' of a new company and give a strong 'clarity of mission', that will act as a key guide in the process of identifying an appropriate legal structure.

3 Financing

Overview

Having a robust and practical financing strategy in place will enable an organisation to focus on achieving its goals. The converse is equally true, that if not planned for, focus and effort is often wasted trying to arrange potentially inefficient financing and in a worst case scenario, when finance does actually run out, the organisation can actually stop operating.

Good business planning should enable an organisation to identify an optimal financing strategy. This should firstly be clear about what levels of finance are needed and for what purpose, then match these needs to 'best- fit' types of finance and to a timetable that ties in with its plans. Once this is understood, then the desired financing can be sought and put into place ahead of time.

In the case of a potential new ESsCo, initial forecasting predicts that in a planned start-up growth scenario, finance will be needed to support early stage unfunded overheads and working capital needs, with a specific identified need to cover future energy purchases and guarantees. Should generation opportunities be followed, then capital expenditures and potential development costs need also to be funded.

The need for financing

Finance is the life blood of any organisation, for however well it performs, if it runs out of money, then everything else stops. In coming up with a financing strategy, an organisation needs to firstly identify what the need or in most cases the multiple needs for funding are. In the case of a potential new ESsCo, there are a number of different reasons and stages at which finance may be needed:

- **Seed capital** - For funding very early stage conception, planning and proof of concept;
- **Venture capital** - For funding launch and early stage business growth;
- **Growth capital** - To fund growth plans in a business;
- **Working capital** - To fund the terms of trade experienced by the business, for example payment periods by customers or advance payments bulk stock for electricity;
- **Risk capital** - Specific to the energy markets, requirement to guarantee future purchases of energy, be that in the placing of security or directly purchasing bulk stocks of energy in advance;
- **Capital expenditure** - To fund the purchase of fixed assets that will be used in the business over a period of time, however need to be paid for at the current time.

Once an organisation has identified what the separate needs for funding are, then it should consider what types of finance can meet these needs. The matching of needs to types of finance will form a core plank of an organisation's financing strategy.

Indicative financing for a potential ESsCo is detailed in the Financial Structure workstream paper.

Types of finance

There are different types of finance available and in short form can be summarised as: grant/donor income; equity; debt; internally generated funds; and hybrid mixes of these. Looking at these in turn:

- **Grant/donor income**
  - Grant support can be viewed as 'free equity' - offering finance, with no financial return required. For a business, this type of finance is not normally an option, however where there is a social/environmental or public good outcome, donor financing can become an available option;

- Attached to any donor support will come a set of alternative burdens - be they reporting requirements or contracted plans of action to be followed, or the potential wasted effort of unsuccessful applications - all of which need to be considered in light of any grant opportunity;
- A general rule of thumb is not to 'bend the organisation' to meet a donor's expectations or requirements, instead to only seek donor support where the donor and the organisation's goals are aligned.

Equity

- Equity is a form of investment that takes ownership in the business and thus a stake in the future financial returns and may require a significant say in how the business is run;
- In general equity only demands financial returns once a business is able to 'distribute' profits - so does not financially burden the company until it is able to do so;
- Traditional equity investors focus on maximising returns - however new breeds of 'impact' and 'ethical' investors traditionally want to see demonstrable positive social/environmental impact;
- Equity investors will enter into their investments with expectation on levels of return pre-set and possible exit. There are different types or 'classes' of investor, ranging from pension funds who are looking for long-term investments, with modest returns in the region of around 7-8% per annum, to venture capital investors, who look for a return of circa 25% and an exit from the investment within 3 or 4 years;
- In summary, there is a range of different types of equity investor with differing interests and expectations on financial and potentially social returns and if equity finance is being sought, as with the donor section, it is important to try and identify 'aligned' investors that can bring more to the table than just their money.

Debt

- Debt comes in many differing forms - from fixed loans to flexible facilities and more Innovative structures such as community bonds;
- In many respects debt is a clear and simple form of finance that can be 'cheaper' than an equity investment in a successful business. However it is far less flexible - usually requiring the repayment of interest and capital even when loss making - so it can be very burdensome to a struggling organisation;
- Debt will normally require security in some form to be lodged by the borrower and funders may also impose constraints on how the business is run, or even require involvement in decision making. Types of security and other terms will vary significantly depending on each deal and funder's requirements;
- As with equity - there are 'social' funds and philanthropic sources that offer loan finance for targeted social businesses. Again the terms and expectations vary greatly between different lenders.

Internally generated funds

- If a company is operating successfully, it will generate profits, which in turn will be transferred to the organisation's reserves, where they will be available for investment by the company for future plans, or distribution to shareholders;

- If an organisation is growing - any internally generated funds may not be apparent externally, however profits being generated and retained within the business for investment purposes, will reduce financing needs to support the growth of the business.

- **Other forms of finance**
  - There are other forms of finance that are variations or mixes of those detailed above. Some examples include: guarantees from third parties that 'enable' finance from another party; preference share capital - that 'mix' the advantages of equity and debt; capital equipment leasing or hire purchase, that enables the structured financing of capital expenditure; to mezzanine finance that requires preferred security over a company's assets.

Once an organisation understands its finance needs and the types of finance that can be utilised to meet these needs, it can then map out a financing strategy. Any finance strategy also needs to consider the timing of when funding is placed, as well as the tax efficiency of the proposed approach and these are considered in the following sections.

Timing and use of finance

It is important that forecast funding requirements are both:

- Received in a timely manner. It is best to receive funds early rather than late, however if a form of finance is interest bearing and it is received too early, then it inherently raises unnecessary costs against the organisation;
- Matched to anticipated expenditures and that technical requirements are profiled in a way that minimises spending in the early stages of the project.

A clear business plan that forecasts the types and timing of required funding should guide any finance strategy. However there is a balance to be struck between the timetabling of finance flows and not overcomplicating administration requirements.

Additionally efficient tax planning should inform expenditure and financing strategies, again ensuring maximum value is retained in the organisation. This is considered in more detail later in this report.

Consideration

The proposal to consider establishing a supply side energy company and potentially linking it to renewable generation activities raises a number of points for consideration in respect of financing:

- **Supply business**
  - Financial analysis of the potential start-up strategy indicates that a range of financing demands will be needed:

    Start-up seed and growth funding to support both uncovered overhead and start-up costs, but also working capital needs for initial and ongoing business growth;

    Access to guarantees or credit lines to enable future electricity prices to be secured;

Provision of security for trading counter-party obligations.

- Initial forecasts indicate that the potential new business would be in a growth phase for a number of years.
  Once a break-even level is reached - then the finance requirement to fund uncovered overheads will not be needed, however working capital demands will persist as long as the business is growing;
  Internally generated funds will contribute to required financing after the break-even level is reached, however whilst early stage significant growth rates exist, there will likely need to be on-going support required in other areas;
  Specifically support in securing future electricity commitments require significant and increasing levels of finance or security on behalf of the new venture.

- **Generation schemes**
  - Finance would be needed for the development costs and capital expenditure of setting up a renewable generation schemes;
  - There is a fairly mature market for establishing these types of projects in the UK, with a mix of debt and equity finance funding these ventures with fairly predictable cashflows.

Different types of finance are suited to alternative legal structures in differing ways. Thus understanding the choices and implications of different legal forms, will help marry forecast finance needs to a chosen structure. Legal form will be considered in the next section.

4 Legal Structure

Overview

There are various standard types of legal form that are adopted by different businesses and include companies limited by shares, companies limited by guarantee, cooperatives or community interest companies.

It is recommended that in creating a new business, the formation of the legal structure should be self determined and not 'shoe-horned' into one of the standard types mentioned above. Instead close reference to 'Founding Principles', finance and other requirements, should inform a bespoke legal design process that will produce an enabling structure for the potential organisation to meet its future aims.

Standard legal forms

There are a number of standard types of legal entity that a new ESsCo and any associated generating entities could adopt:

- **Company limited by shares**
  - This is a structure that allows ownership by shareholders and is the most commonly adopted form by conventional companies driven by a pure profit motive;

- However the company's rules and share structure can be set up to meet a differing mission focus of the company.

- **Company limited by guarantee**
  - This structure has no financial ownership, instead members 'guarantee' a limited value (normally nominal) against any future insolvency;
  - This form is most commonly adopted by mission driven/social enterprises wishing to undertake business activities;
  - The main limitation in an entity like this is that financing needs to come from internally generated profits, debt or grants as traditional equity investment is not available because of the exclusion of share capital.

- **Cooperative/members association**
  - This structure has shared ownership by the organisation's membership. It offers an efficient trading platform to combine different members' interests in a fair and equitable manner and is commonly used to capture the positive synergies of working together;
  - The main limitation of the traditional form of a cooperative is that financing needs to come from internally generated profits, contributions from members, debt or grants - with traditional equity investment not being available because of the non-availability of shares to external investors.

- **Community Interest Company (CIC)**
  - A CIC is a form of company which can be limited by shares or by guarantee and runs with a stated mission and target 'community';
  - Its default structure ensures that an 'asset lock' is in place, which in the case of a limited by shares company ensures that private shareholders cannot 'strip' the company down for their own benefit;
  - Being a CIC also acts as a good 'communicator' to external parties of an organisation's intention.

The above list is by no means exhaustive, however gives an indication of the different standard types of structure available.

Additionally, a number of stakeholders consulted mentioned a desire for any future entity to be a Social Enterprise. There are differing definitions of what a social enterprise is, however Social Enterprise Scotland's explanation[11] acts as a good guide, explaining that they:

> "*...operate in all markets, selling goods and services to individual consumers, local authorities, central government and private businesses... exist to make a profit... however, profits or surpluses they make are always reinvested into their social and environmental purposes, they have an 'asset lock'... business models are diverse and include: Co-operatives and Mutuals, Credit Unions, Housing Associations, Social Firms, Development Trusts and Community Interest Companies.*"

Determining the legal structure

The list of standard legal forms, detailed above, acts as a good generic menu as to what types of vehicle are available for adoption. However it is not recommended to limit a consideration to these options alone.

11 http://www.socialenterprisescotland.org.uk/our-story/social-enterprise-faq/

Instead it is recommended that considerations are driven by what is wanted and what is feasible. Once this has been established, a potential legal structure can be mapped out, balancing competing demands and other points of consideration. In undertaking such a process it should be noted that:

- The rules or constitutions of an entity can be specifically tailored to support the desired mission;
- A desired legal structure can be made up of more than one legal form, with connected entities achieving the desired objectives;
- Characteristics and elements of different standard legal structures can potentially be merged to achieve a more appropriate form;
- Contract structures should be considered alongside the type of vehicle on a holistic basis.

In the case of establishing an ESsCo or renewable generating arm, there is a clear view that a social enterprise type vehicle should be set-up and also clear guidance on the types and levels of finance likely to be required. Given this and the detailed consideration of 'Founding Principles' discussed below, an 'ideal case' legal structure should be able to be worked up.

Founding Principles

Essential in enabling the above analysis to take place is having certainty as to what the desired 'Founding Principles' of an organisation are. As described in Section 2 above, having clarity around this will not only inform the legal formation process, but also guide the ongoing operational activities of a new entity.

5 Efficiency of structure

Overview

A proposed new ESsCo will be established with social goals alongside conventional financial targets and as such will need to ensure that its social mandate is protected and is central to the future development of the business.

A governance structure should be set-up that involves a balanced representation between the main stakeholders and expert non-executives.

Clear founding principles with secondary and tertiary objectives should be put in place, both as guides for future decision making, but also benchmarks for the organisation at all levels to measure itself against. These should be captured in a comprehensive business plan, that will act as the blueprint for agreed plans and also act as both a unifying document, with all stakeholders 'getting behind it', and as a reference for performance against agreed targets, both social and conventional.

Protecting the mission

As discussed above, key stakeholder views are that a potential new organisation

should be a 'social enterprise' type body and have a primary target to offer an 'affordable' energy cost to low-income customers.

A defined social mission of a new organisation will be articulated in its 'Founding Principles'. These 'Founding Principles' will need to be drafted to protect against future threat and unwarranted deviation and this should be incorporated as part of the legal structuring process.

There are a number of ways in which the social objectives can be protected. Some common suggestions are:

- Drafting them into the Memorandum and Articles/constitution of the new organisation;
- Establishing 'guardian' ownership by a separate charitable body;
- Ensuring strong governance oversight of this aspect;
- Establishing a controlling stake in the venture by a 'protective trust'.

There will be other ways to address this matter, however a final solution can only really be achieved when considering the matter holistically, in light of other balancing priorities of the organisation.

Governance

For the potential new venture to achieve its goals, it needs to ensure it has effective governance at all levels of its organisation:

- Having clear 'Founding Principles' with secondary and tertiary objectives in place, should enable clarity at both board and executive levels;
- Having a clear plan will enable founders, financiers and other stakeholders to 'buy-in to' and maintain a jointly aligned view;
- Structuring and running the board efficiently, effectively ensuring that:
  - Stakeholder representation is in place - and in structured and clear roles, for example founder RSLs should appoint a representative from their group to sit on the board;
  - A detailed skills audit should identify the required capacity that needs to be in place on the board for it to govern effectively;
  - Members of the board are balanced between different interest groups, allowing influence from each party to be exercised, but not the power of veto (unless this is the desire);
  - The recruitment of independent non-executives should be encouraged, to avoid the board being purely a collection of vested interests;
  - Resources should be allocated to ensure that the board and advisors are 'connected' to the executive and able to both support and direct from a non-executive perspective.
- The executive function should be aligned with the 'Founding Principles' and subsidiary objectives, with clear goals and lines of accountability to support the executive in monitoring its own plans and reporting back to the board.

The general principle that should be sought is establishing alignment of mission at all levels in the organisation. If everyone is 'pulling in the same direction', and an enabling environment is adequately resourced, then inherently the chances of success are maximised.

Making a plan

Creating a detailed business plan will provide clear direction over all aspects of the proposed new venture and present it in a single place.

Not only does a plan inherently test the viability of a new proposition, it will enable all stakeholders to buy- in to the same vision, with the necessary detail and analysis, to allow them to commit to it.

Additionally a plan enables the board to set the executive both financial and social performance targets, with associated incentives, should that be deemed appropriate.

Efficiency of structure consideration

There will always be competing priorities in respect of the effective governance of an organisation, balancing the needs of monitoring the executive function and protecting the mission against not becoming intrusive or a burden to the company's operation.

The right skills and adequate resourcing are essential requirements to enable the governance function to operate. However having clarity over what the organisation is aiming to achieve, both at the 'Founding Principle' level and also around targeted objectives, should support all levels of the governance function to work in line with the executive.

A thorough business planning process, building on firm foundations laid down by firstly establishing clear 'Founding Principles' will enable clarity in all aspects of what the organisation wants to do and assist in ensuring a governance structure works efficiently, at all levels, for the potential new venture.

6 Other points of consideration

Overview

In establishing a new organisation to run an energy business, the choice of legal structure should further consider making it as efficient as possible in respect of maximising returns and tax planning and also remain aware of the risks associated with choosing a 'wrong' legal form.

Where subsidiary activities are aligned to the overall organisation's aims, the venture should not be adverse to profit maximising, so that surpluses can be 'recycled' and used to support the main activities of the organisation. In respect of the proposed new ESsCo, there would appear to be opportunities to deliver development premiums on the establishment of renewable energy generation sites.

Tax advice should be sought when a chosen business model is settled on. Ensuring an organisation has efficient tax planning in place will again maximise retained earnings for the purposes of achieving the organisation's aims.

There are numerous risks and threats associated with launching and running a start-up company. Key pitfalls to be avoided, while settling on a legal form for a new ESsCo, centre around ensuring current and future financing needs can be met, governance structures are efficiently set-up and the social aims of the organisation have adequate legal protection.

Maximising returns

It is expected that the proposed ESsCo would be set-up as some form of a social enterprise, with a primary social objective to make the cost of energy to low-income consumers fair and affordable.

Although the new venture will not be a traditional profit maximising business in respect of the sale of energy to its customers, it will potentially have other commercial activities that will not be directly linked to these key social/business targets. In respect of these activities it is recommended that the new enterprise should be open to maximising returns.

One main area for consideration is the production of renewable energy and the creation of a vertically integrated supply chain:

- This has clear benefits in respect of both: meeting the new company's obligation to supply over 20% of its electricity from green sources; and also delivering certainty as to the price of future energy purchases;
- In addition given available government subsidies in respect of the generation of renewable energy by means of the Feed-in-Tariff (FIT) scheme and Renewable Obligation Certificates (ROCs), there is an opportunity for development profits to be captured by the ESsCo.

In this respect if the new venture had a separate activity centre focussed on the development of renewable energy, it could forecast development profits that would be available to support its core business and social targets.

It is not recommended that the new company searches for 'avoidance' type schemes to maximise its profits, however where activities are aligned with its business, such as the generation of renewable energy, then the new venture should consider running these activities as efficiently as possible and maximise returns for the benefit of its overall aims.

In respect of the above, should the new venture choose to develop a vertically integrated supply chain, then the most efficient legal structure should be designed to enable both the ease of operation and also the maximisation of returns.

Taxation

Similar to the consideration above, it is recommended that planning for and managing the tax regime of a new ESsCo should be organised in as efficient a manner as is possible. Again, 'sharp' avoidance schemes are not recommended, however good planning should ensure maximum value is retained in the organisation to pursue its social aims.

Tax advice should not be a driving force in deciding 'what is wanted' by the organisation. Instead it should be considered alongside other points when deciding on an optimal legal structure to deliver on its chosen objectives. Indeed tax advisors recommend that detailed consideration should be saved for when there is clarity over what the organisation wants to do, and then alongside legal structure, detailed tax planning can take place.

However some general points to consider in respect of taxation are as follows:

- **Supply Company**
  - Corporation tax should be payable on all profits generated and although the organisation may choose not to be profit maximising, it would be liable to corporation tax on any profits retained in reserves. However should the company be established as a 'pure' social enterprise, with no shareholders and limited by guarantee, then there may be an opportunity to negotiate with the HMRC to obtain exemption from corporation tax, in the same way as a charity would. This is not a certain conclusion, however advice given indicates that it would be a possibility;
  - Care should be taken in making expenditures to associated energy projects, as for expenditures to be allowable, they need to be linked to the trade of the business;
  - Investment income in the form of grants will likely be liable to taxation, however loan income, although incurring an interest charge, will be available to reduce chargeable income.

- **Generation Scheme**
  - Good capital allowance reliefs are available in respect of capital expenditures if the developer has an interest in the developed land;
  - Interest on long-term capital loans can be 'rolled-up' and offset in advance against income;
  - Dividends payable not subject to tax if from post taxable profits;
  - Capital gain made on development not taxable if development held for greater than 12 months;
  - Establishing the scheme as a limited liability partnership (LLP) could offer some advantages, however these would need to be considered holistically at the time of inception;
  - If joint venture with other investors, then:

    These can be made more attractive to those joint parties through enterprise investment scheme (EIS)/venture capital trust (VCT) reliefs available for ROC sized schemes (greater than 5MW);
    Should the generation scheme be set-up as a Community interest Company (CIC), then EIS reliefs would be also be available for FIT sized schemes (less than 5MW)

The above gives some indicative pointers, in respect of tax planning, when setting-up a new ESsCo, however detailed tax advise should be sought, once there is clarity as to the organisation's chosen business model.

Risks and threats

There are numerous risks associated with establishing any new start-up business and also many more directly linked to setting up and running an energy company. In considering

the legal framework, a number of specific threats are considered below:

- **Financing** - Both the ability to attract and house start-up and on-going finance needs of the organisation should be considered. The risk in not planning for this is and being challenged in raising finance for a chosen legal form will distract the attention of the organisation in attempting to resolve these matters and in the worst case scenario restrict future growth plans.
- **Governance** - Dysfunctional governance can paralyse an organisation. Thus establishing balanced membership of the governing body and ensuring that founding principles, secondary objectives and tactical targets are laid down transparently at all levels of the organisation are important tasks to make sure that they have these in place.
- **Mission Protection** - Should the intended social objectives of the organisation not be inherently protected from the outset, then vested interests may be tempted to discard certain aims for their own advantage. This can lead to wasted effort within the organisation in defending any such moves, or in a worst case scenario for the organisation to lose certain social goals from its mandate.

By planning and considering thoroughly each of the above aspects, obvious risks and threats in respect of establishing a new legal structure can be avoided.

7 Process

The above analysis highlights a number of areas of consideration in respect of starting a new energy business and settling on the best legal structure to launch it from. Key areas noted are understanding 'what is wanted' and what the financing needs are. Based on these key drivers an appropriate legal structure can be matched. Other factors that need to be considered are ensuring the governance structure is efficiently set-up; that returns are maximised where possible and not conflicting with the social mission; that efficient tax planning is undertaken' and that the overaching social mission of the organisation is protected from the outset.

To achieve a desired legal structure, the following process is proposed:

- Key stakeholders agree on 'Founding Principles' and as far as possible secondary and tertiary objectives;
- A proposed business model be developed and that this and the 'Founding Principles' be the main pillars of a business plan that is developed;
- The business plan should look at the proposed new venture holistically, ensuring all aspects of the new business launch and ongoing operation are considered, including start-up and future financing, governance structures, tax planning, mission protection and adoption of chosen legal form;
- The business planning will be an iterative process and should include involvement and buy-in from all key stakeholders.
- Once completed, the business plan will be the key tool used for raising necessary finance, guiding the governance function and setting targets for the executive to launch the business;
- The chosen legal structure can then be set-up and from this the business finally launched.

Electricity Trading

Balancing and Settlement

Kingdom Housing Association

Kingdom Housing Association

Chapter Summary

In the UK, electricity is traded and distributed to consumers - both households and businesses - through a complex and highly regulated network of relationships.

Electricity is generated, transported, delivered and used continuously in Great Britain in real-time. Supply must always match demand as electricity cannot generally be stored. Although the process is continuous, for the purposes of trading and "settlement" electricity is considered to be generated, transported, delivered and used in half hour chunks called "settlement periods".

The electricity market in the UK allows:

- Customers to use a supplier of their choice
- Suppliers to buy electricity to meet the demands of their customers from the generator(s) of their choice, and
- Organisations without a physical demand for electricity, or any means of generating electricity (e.g. banks) to trade electricity, known as non physical traders.

Suppliers are licensed by Ofgem to supply electricity to domestic and non-domestic premises. The supplier can buy electricity from the generators, traders and other participants in the trading (wholesale) market and sell to consumers (retail market). They need to forecast, monitor and manage the system of trading and delivery. This means they have to accurately forecast consumer usage and purchase sufficient energy to cover this in the right time frame, and have processes for covering shortfalls and over supply within the regulations. They must contract with meter operators, data collectors and data aggregators to provide services that enable them to manage and assess performance, pay the transmission system operator i.e. the National Grid, for the delivery of electricity to their consumers, and bill and collect payments from their customers.

Generators are licensed by Ofgem to generate electricity and have to sign up and comply with the Balancing and Settlement Code (BSC) arrangements and market entry requirements. Generators own the plant and apparatus used to produce the electricity and are responsible for the meters that record the amount of electricity that they produce. Generators have to forecast the amount of energy they will generate, and coordinate the process and information flow in order to manage the electricity that they deliver, buy and sell, and manage any imbalance accordingly. It is in the interest of generators to make agreements that include guarantees/insurance against loss of production, business interruption, maintenance, credit and counterparty cover arrangements.

Metering is an essential part of the balancing and settlement process. This provides the method by which actual electricity use is measured and validated and then

matched against forecast. The supplier appoints various “supplier agents” to install meters, collect data and process it for settlement.

Like most commodities, electricity is traded on a wholesale market. Most of this trading is done in a forwards market, with generators and suppliers entering into contracts with each other for every half hour of every day, sometimes years in advance.

Suppliers and generators try to match their demand and generation to their contract levels by careful forecasting so that they do not have a surplus or deficit of electricity. However, in practice the following can happen,

- Suppliers may have forecast their electricity requirements incorrectly,
- Generators may be unable to generate their contracted amount, or
- There may be problems with transporting electricity

These are the surpluses and deficits referred to as imbalances.

Where a supplier has used more electricity than they contracted for, they must buy additional electricity from the grid to meet the amount used; where a generator has generated less than they were contracted to, they must buy additional electricity from the grid to meet their contracted levels; and vice-versa.

If suppliers and generators do not make arrangements themselves within the half hourly settlement period or if arrangements have not been accurate, the National Grid will do this them for them at whatever cost is available at the time and at short notice. This can vary hugely and be highly punitive for the supplier and/ or the generator and represents one of the biggest risks in the process.

Entering the market as a supplier involves a range of responsibilities and risks. New suppliers need to effectively cover customer relationship management, operational delivery and industry management. Cost considerations in the balancing and settlement process for a new ESsCo entering and operating in the market include:

- Wholesale energy costs
- Imbalance charges
- Local Distribution Charges
- National Transmission (National Grid) Charges
- Operational costs

There is little doubt that the balancing and settlement system is a complex mechanism and carries significant risk where engagement is not managed or risks are not understood. However, it is also clear that it is possible to work effectively and profitably within the system, and that the requirements and risks can be managed through systems which can be purchased either as stand-alone packages or as a paid-for service.

Having a clear risk framework and strategy for managing the risks is key to entering and operating in the market. The impact of the risks are reduced depending on customer numbers simply because the level of exposure is less. This allows a new entrant to learn and evolve without risking the company’s capital and reputation.

1 Introduction

The balancing and settlement system is a complex set of relationships, rules and data flows that allow for the generation, transmission and supply of electricity from the generation source through to the end customer – both domestic and non-domestic. The report below sets out the balancing and settlement process, mechanisms for dealing with the process and the risks associated with it. It also outlines how a new entrant to the energy supply market can manage this.

This report sits alongside the reports on the regulatory framework, introduction of smart meters and financial model.

Aims and methodology

The aims of the balancing and settlement workstream are to:

- Review the balancing and settlement system covering background, requirements, risks and opportunities, generation and supply
- Develop a detailed understanding of the costs and processes involved
- Identify from an industry perspective the risks and opportunities
- Identify potential suppliers and costs to manage the balancing and settlement system
- Identify potential partnership opportunities and map risks and benefits

The work was undertaken through desk-top review, work with systems developers and industry experts.

2 Overview of the Balancing and Settlement Process

Background: generation and supply

Electricity is generated, transported, delivered and used continuously in Great Britain in real-time. Supply must always match demand as electricity cannot generally be stored. Although the process is continuous, for the purposes of trading and "settlement" electricity is considered to be generated, transported, delivered and used in half hour chunks called "settlement periods".

The diagram below indicates the key participants in the generation and supply of electricity. A more detailed diagram outlining all of the participants involved is provided below.

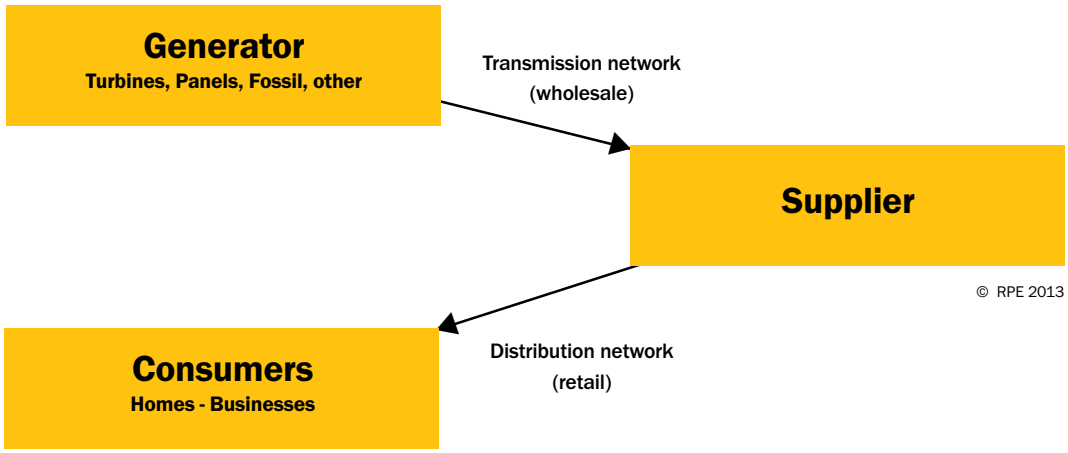


Fig 1 – Electricity trading supply chain

The electricity market in the UK allows:

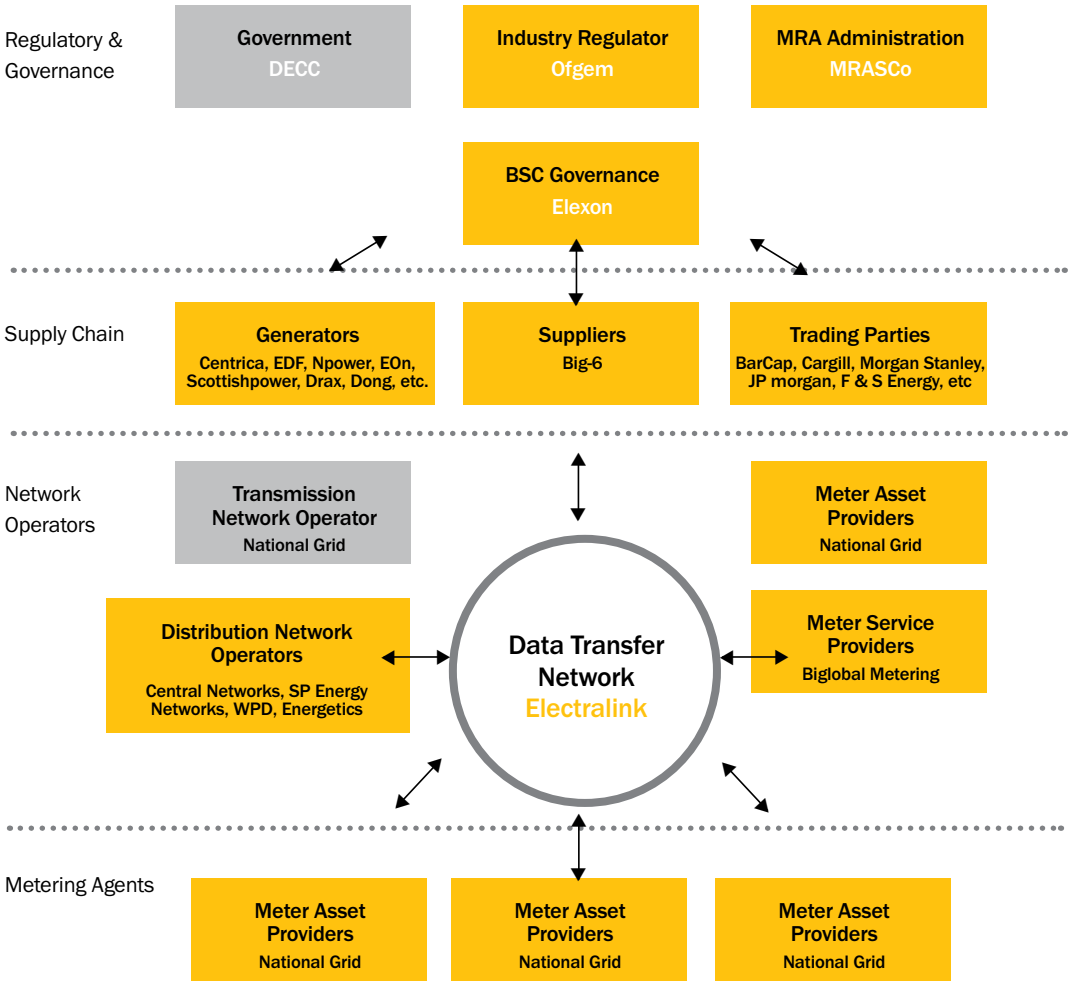
- Customers to use a supplier of their choice
- Suppliers to buy electricity to meet the demands of their customers from the generator(s) of their choice; and in addition to the above, allows
- Organisations without a physical demand for electricity, or any means of generating electricity e.g. banks, to trade electricity, known as non physical traders.

3 The Regulatory Framework

Regulation & Governance

There are a number of bodies involved in the regulation of the industry, as set out below.

Key participants in the UK electricity industry



The Department for Energy and Climate Change (DECC)
DECC is the government department with responsibility for ensuring that the UK has secure, clean, affordable energy supplies and promotes international action to mitigate climate change.

The Office of Gas and Electricity Markets (Ofgem)
Ofgem is the industry regulator which protects energy consumers through the promotion of value for money, security of supply and sustainability, through the supervision and development of markets, regulation and the delivery of government schemes.

The Master Registration Agreement (MRA) and Master Registration Agreement Service Company (MRasco)
The Master Registration Agreement sets out the inter-operational arrangements between all licensed electricity distribution businesses and suppliers that support the processes for the registration of a change of electricity supplier in the retail market in Great Britain. MRasco administers the MRA and is a joint-venture company established and maintained by all parties to the Master Registration Agreement (MRA).

ELEXON - the Balancing and Settlement Code Company (BSCCo)
Elexon was established under the provisions of the Balancing and Settlement Code (BSC). The BSC contains the rules and governance arrangements for electricity balancing and settlement in Great Britain, and ELEXON is responsible for ensuring its proper, effective and efficient implementation. ELEXON's systems capture the contracted volumes from generators and suppliers so they can see what they said they would produce or consume. They also capture data on actual supply and demand volumes.

The Supplier's role

Suppliers are licensed by Ofgem and have to sign up to the BSC arrangements in order to supply electricity to domestic and non-domestic premises. As indicated above, the supplier can buy electricity from the generators, traders and other participants in the trading (wholesale) market and sells to consumers (retail market).

Suppliers need to monitor and manage the system of trading and delivery. This means they have to accurately forecast consumer usage and purchase sufficient energy to cover this in the right time frame, and have processes for covering shortfalls and over supply within the regulations.

In addition, suppliers must contract with meter operators, data collectors and data aggregators to provide services that enable them to manage and assess performance. The supplier is responsible for managing performance using all these systems but cannot own these systems themselves. They must also pay the transmission system operator i.e. the National Grid, for the delivery of electricity to their consumers. They must also bill and collect payments from their customers for consumption and are responsible for accessing accurate information for that consumption figure.

Under the regulations, the supplier does not directly own any of the infrastructure associated with the generation or consumption of electricity, or the transport of electricity over the transmission or distribution networks. It cannot own, fund, install, maintain or validate meters for settlement purposes.

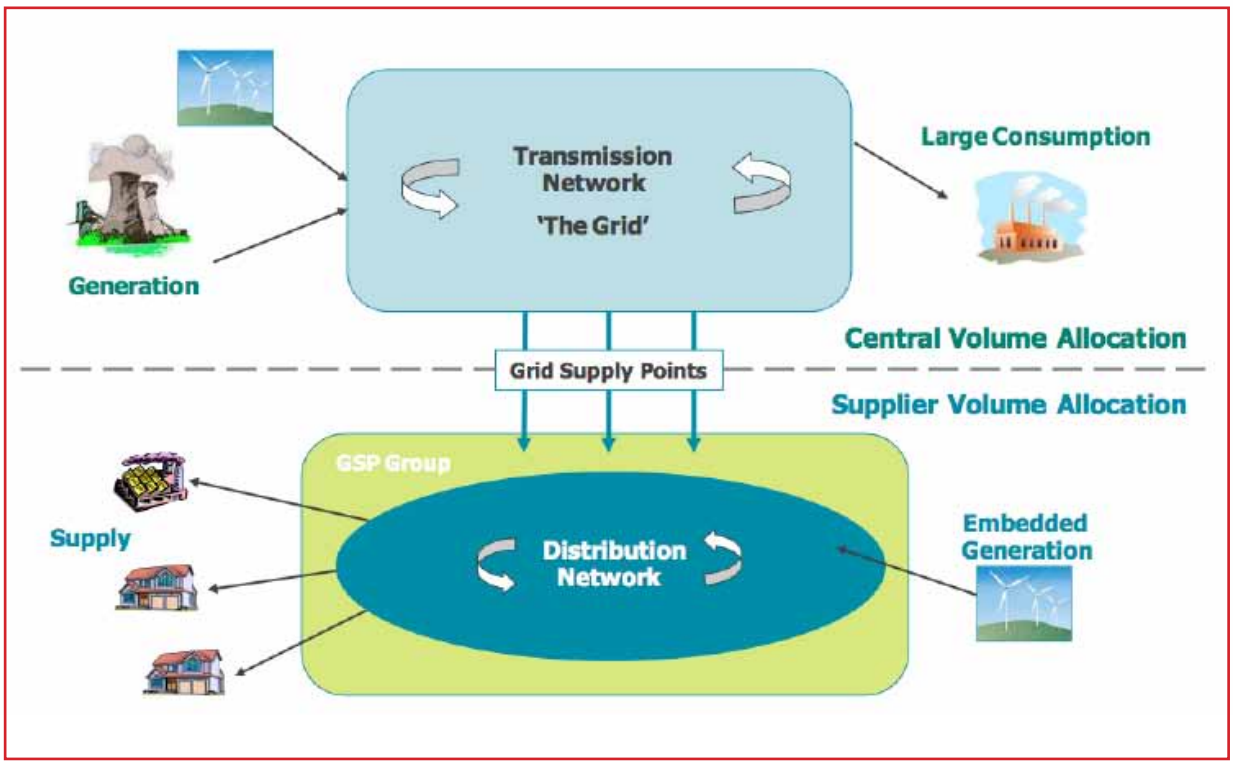
The generator's role

Generators are licensed by Ofgem to generate electricity and have to sign up to the BSC arrangements and market entry requirements. Generators own the plant and apparatus used to produce the electricity and are responsible for the meters that record the amount of electricity that they produce.

There are 2 main types of generation in the system,

- Large, high voltage generators, such as nuclear, gas powered or coal fired power station, offshore wind farms) - these deliver electricity directly into the transmission system, the National Grid. Large scale industrial demand such as steel works and refineries, draw electricity directly from the transmission system. This generation is the base of electricity supply nationally. The main purpose of the transmission system is to deliver generation to the distribution networks, the connection point between the transmission and distribution networks is known as the grid supply point (GSP).
- Smaller lower voltage generators, such as combined heat and power, wind turbines, solar power - these small scale generators are usually connected to and embedded in the distribution network and are known as embedded generation.

Electricity Transportation and Distribution System



To gain market entry and be licensed a generator has to demonstrate that they have:

- installed and have the capacity to produce, manage and deliver the electricity
- the connections and communications systems with the National Grid and Elexon,
- 24/7 montoring and management systems
- all necessary agreements with other trading parties including credit cover and counterparty cover.

It is in the interest of generators to make agreements that include guarantees/ insurance against production, business interruption, maintenance, credit and counterparty cover arrangements.

Generators have to forecast the amount of energy they will generate, and coordinate the process and information flow in order to manage the electricity that they deliver, buy and sell, and manage any imbalance accordingly. If they do not, the grid will

buy the shortage at whatever price is available on the open market and charge the generator.

Generators sell electricity to suppliers who need it to meet the demand of their customers.

Non-physical traders

As stated above, it is not only generators and suppliers who can contract for and trade electricity. A non-physical trader can also enter into contracts to buy and sell electricity.

They do not have any generation to sell, or any customers' demand to satisfy, but trade electricity for profit. The non physical trader buys electricity from a generator at a negotiated price, and will sell it on to a supplier, with the aim of making a profit.

Metering role

Metering is an essential part of the balancing and settlement process. This provides the method by which actual electricity use is measured and validated and then matched against forecast.

There are two types of metering systems, those which measure and record electrical energy flow for each half hour for settlement (half hourly metering systems) and those which measure and record over longer periods of time, from which energy flows in each half hour can be estimated (non half hourly metering systems- NHH). NHH systems are used for domestic and small businesses, which is the focus here.

The roles of the meter operator, data collector, data aggregator are separate and distinct from the supplier and generator. Generators and suppliers are not allowed by regulation to own the meters. The supplier, i.e. the company that sends out electricity bills, is responsible for ensuring that all these roles are contracted out in their supply chain.

The supplier appoints various "supplier agents" to install a meter, collect data and process it for settlement. The three supplier agents that need to be assigned for each meter are:

- The Meter Operator (MOA) installs and maintains the meter,
- The Data Collector (DC) retrieves this data and calculates the Estimated Actual Consumption (EACs) and Annualised Advance/actual data (AAs), and
- The Data Aggregator (DA) sums up the volumes (EACs and AAs) for each supplier and sends this information into Central Systems.

Meters are generally owned as an asset by investors or investment companies. Suppliers and generators generally pay a rental fee for the use of these meters as part of their costs.

Metering is the subject of another report in this Warm Homes Fund suite and it explores in detail the opportunities provided by new smart meters.

The buying and selling process

Like most commodities, electricity is traded on a wholesale market. Most of this trading is done in a forwards market, with generators and suppliers entering into contracts with each other for every half hour of every day, sometimes years in advance. Non-physical traders such as investment banks also participate in this trading.

For each half hour of every 24 hours (known as settlement periods), those with demand for electricity i.e. large businesses, and those with customers with demand for electricity i.e. suppliers, will assess in advance what the demand will be. For each half hour, they can continue to trade up to one hour before the settlement period for which the contract covers, at which point the market for that time period is closed. This is called 'gate closure'. In the half hour itself, generators are expected to generate and deliver their contracted volume of electricity and suppliers are expected to use their contracted volume of electricity.

Suppliers and generators try to match their demand and generation to their contract levels so that they do not have a surplus or deficit of electricity. This is one of the key objectives of the trading arrangements in encouraging all participants to have contracts covering all of their generation and/or demand.

However, in practice the following can happen,

- Suppliers may have forecast their electricity requirements incorrectly,
- Generators may be unable to generate their contracted amount, or
- There may be problems with transporting electricity

These are the surpluses and deficits referred to as imbalances.

4 Balancing and Settlement

Costs, Processes and Risks

Bids and Offers

In view of the system for the generation and supply of electricity, as outlined above, there is a requirement for real-time management to ensure that supply matches demand and to address any issues with transportation and delivery. This role is fulfilled by the system operator, the National Grid.

Generators with additional capacity, i.e. those that have not contracted for the full volume that they can generate in any half hour, can make that additional volume available to the system operator and can set the price they wish to receive for that additional volume. Similarly, a generator can state that it will reduce the volume being generated, and can set a price for reducing their generation.

Suppliers that are flexible enough can offer to reduce their demand to make additional volumes of electricity available to the system operator and can set the price they wish

to receive for that additional volume. Similarly, flexible suppliers can agree with the National Grid that they will increase demand for a set price.

These are called *Bids* and *Offers*,

- An offer is a proposal to increase generation or reduce demand; and
- A bid is a proposal to reduce generation or increase demand.

The National Grid will, in real-time, and as required, match supply and demand in each half an hour by accepting bids or offers depending on whether they need to increase or reduce electricity generation to meet demand.

Afterwards, the National Grid collects metered volumes for the half hour from generators and suppliers, and compares these against their contracted volumes, which are adjusted for any bids or offers accepted. All parties have their contracted volumes compared to determine whether the volumes they bought and sold match.

Where the contracted volumes do not match the metered volumes, the following applies,

- Where a supplier has used more electricity than they contracted for, they must buy additional electricity from the grid to meet the amount used;
- Where a generator has generated less than they were contracted to, they must buy additional electricity from the grid to meet their contracted levels.

And vice-versa,

- Where a supplier has contracted for more electricity than they used, the supplier must sell that additional electricity to the grid,
- Where a generator has generated more electricity than they were contracted for, then they must sell that additional electricity to the grid.

The balancing and settlement process

If suppliers and generators do not make these arrangements themselves within the half hourly settlement period the National Grid will do this them for them at whatever cost is available at the time and at short notice - this can vary hugely and be highly punitive for the supplier and/ or the generator. This represents one of the biggest risks in the process.

The differences, as indicated above, are referred to as imbalances, and settlement is the process of calculating the volumes of imbalance and the prices to be paid for these imbalances. Settlement also works out other related charges and payments.

So, if a generator has supplied less than it said it would for the half hour, it must pay for the imbalance between its declared and actual position. Or, if a supplier's offer to reduce demand for a half hour was accepted by National Grid, then it will be paid for that balancing action. Elexon manages prices and payments through the settlement process.

Under the BSC arrangements, payments to and from trading parties in respect of trading charges arising on any particular day are made, on average, twenty-nine calendar days later. Thus, at any given time, trading parties may have debts, or be

due payments, in respect of trading charges incurred, on average, over the previous twenty-nine days.

Risk

This is an area of high risk for suppliers and generators as they could incur punitive charges for getting their forecast of energy usage or generation wrong. The system operator will buy energy on their behalf and charge them a rate which they must cover and which may be several hundred or thousand % greater than their budgeted costs and credit cover.

The settlement process for each settlement period goes through a number of rounds as more data becomes available and the calculations are repeated on four occasions, spaced across 14 months, providing a more accurate picture of settlement each time.

Imbalances are settled centrally, through BSC Central Systems which are designed to perform this role. Imbalance settlement is a closed system for the money paid in and out,

- Any surplus cash is redistributed amongst all parties; and
- Any deficit is charged proportionally to all parties.

Where any party does not meet its imbalance charges i.e. it defaults on payment, for whatever reason, all the parties pick up the cost proportionally. For further details of the relevant parties see Annex A.

Credit arrangements

There are credit arrangements in place to reduce the risk that the rest of the industry will be required to pay a defaulting party's settlement liabilities. Elexon estimates suppliers' imbalance exposure on a continuous basis and translates it to a monetary value. Suppliers are required to lodge credit in excess of this monetary value, so that should they default, the money owed can be recovered from the credit they have lodged rather than from other parties. This 'credit cover' protects other parties if a supplier defaults.

The BSC does not stipulate the amount of credit cover that trading parties must provide. Instead, trading parties decide on the level of credit cover that they wish to provide, and credit checking is intended to ensure that a trading party cannot accumulate a debt over the twenty-nine day period that exceeds the amount of credit cover provided. If a party does not have sufficient funds it will enter into credit default.

Credit Default

Each BSC Party is required to lodge collateral with Elexon to ensure that there are sufficient funds available to cover that party's trading charges should the party become unable to pay. If a party does not have sufficient funds it will enter into credit default. The credit default processes are triggered when a party's credit cover percentage (CCP) exceeds a number of thresholds. A Level 1 credit default process is triggered when the CCP exceeds 80% and the Level 2 credit default process is triggered when the CCP exceeds 90%.

The consequences of credit default

There are industry consequences to having insufficient credit cover. If a party enters credit default a notice will be published by the Energy Contract Volume Aggregation Agent (ECVAA) on the Balancing Mechanism Reporting Service (BMRS). This may result in the party's trades being rejected by the ECVAA system. The reputation risk in the industry may mean that a supplier is unable to trade further.

If a party fails to resolve a credit default situation, the party will potentially be in default of the BSC. If this occurs, a meeting of the BSC Panel will be convened for decision on the next steps regarding the party's status under the BSC.

Counterparty Credit Cover

There is a process for having counterparty credit cover and this depends entirely on the counterparty's own credit arrangements. In essence, the relationship is structured in a Grid Trade Master Agreement (GTMA), which covers credit arrangements, collateral, payment, and the legal responsibilities of each party. Individual agreements are required with each potential trading party.

The Forecasting Process

In order to minimise the risks involved, the parties need to forecast demand as accurately as possible. The factors that need to be considered in doing this are outlined below.

Purchasing and settlement – the calculations

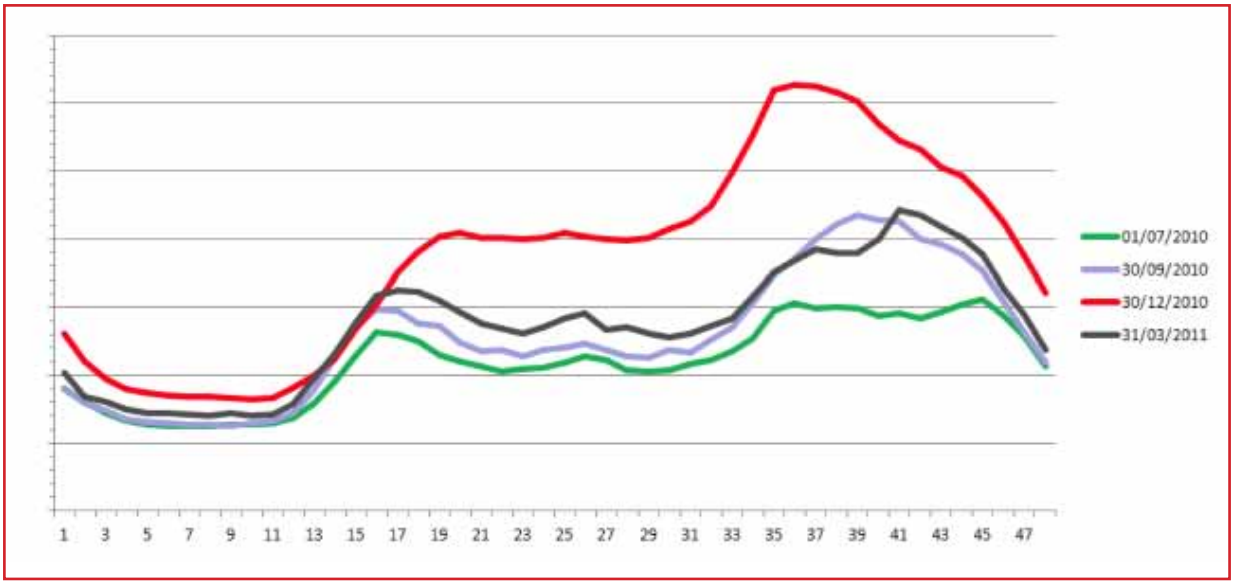
Although electricity is traded, purchased and settled in half hourly time periods for accurate settlement calculations, half hour metering is only used for very large consumers. For all others, known as non-half hourly consumers, consumption profiles are assumed to be the same pattern for all those in the same category.

In practice, customer consumption varies,

- Within a day
- By weekday/weekend/holiday
- Seasonally

To take account of this in calculating domestic consumption, the industry has created 'synthetic' profiles which are used for calculations. These profiles are based on a block profile modelled on:

- Use (shape varies every day of the year)
- Geographical variations for same type of consumer.



Typical Daily Consumption Patterns - Domestic

These are the patterns on which forecast calculations are based then calculated against validated metering data and charges made on imbalances. It is critical that non half hourly consumption forecasting is calculated in this way using the 'synthetic' calculation profile published by the industry.

Forecasting timelines

The supplier produces a forecast of consumption on two timelines, one for each half hour and one for as long in the future as they consider appropriate based on their management and risk profile. This calculation should become increasingly accurate closer to delivery. They will use historic profiles as the baseline for this calculation.

The supplier needs to estimate how many customers will be on supply on each date, for this they will need to allow for anticipated sign up of new customers and for the attrition rate in customer losses. Suppliers also need to make adjustments to allow for seasonal factors and weather variations e.g. comparing the temperature with same week in the previous year to use as a guide.

Risks – forecasting shortfalls

- **Getting accurate information when they sign up a new customer and sign off an old one (they will have to cover imbalances sometimes at high prices)**
- **Lodge credit cover – large cash commitment (29 days worth of business)**
- **Monitor transmission and delivery 24/7**

A generator does a similar calculation in terms of forecasting the energy they need to generate versus the actual energy generated, using technical and historic data. In the case of turbines wind, weather, technical difficulties can all play a part but this must be adjusted before the settlement period.

Typical Energy Purchase Structure

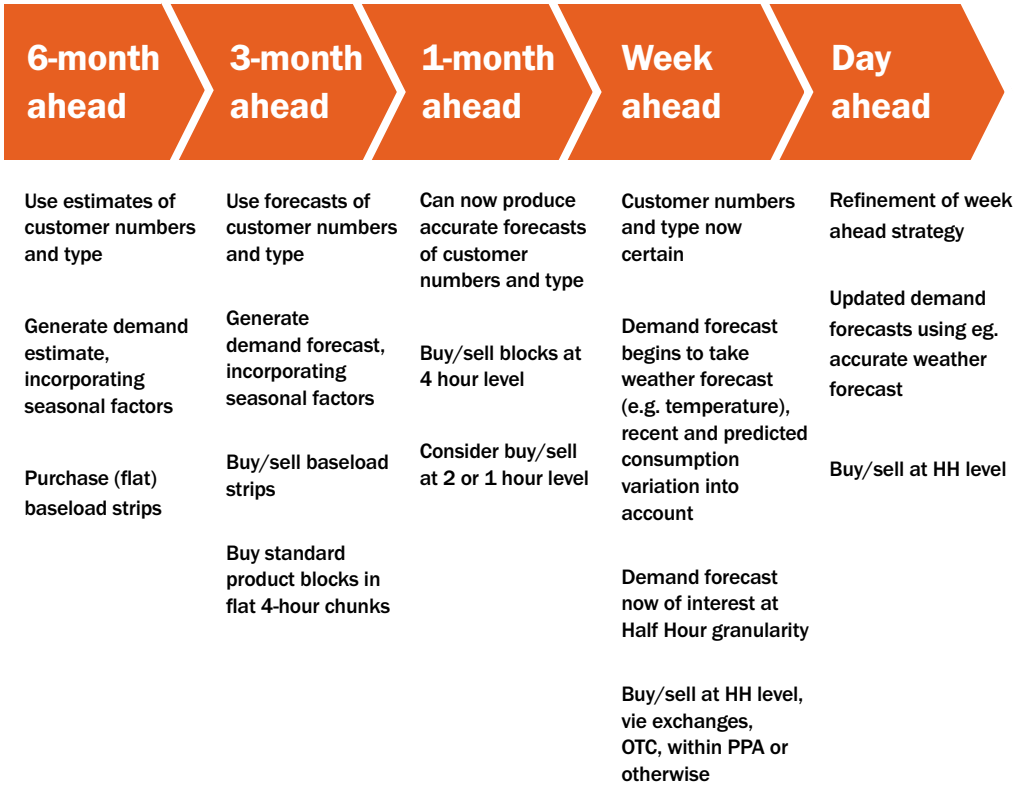
Energy is usually purchased as 'products' - e.g. baseload, peak, off peak, weekday, weekend - in line with the industry patterns of consumption. The purchasing timeline used is Electricity Forward Agreement (EFA) day and EFA calendar.

The supplier will buy a baseload of energy for their supply, for example, six months in advance. This is their core guaranteed supply and the price at this stage may well be the lowest in the cycle as it is furthest from the delivery point. They will then buy their second baseload say three months in advance when they should be able to identify their need more accurately.

One month in advance they should be able to identify their peak demand and buy at peak trade prices. At one week in advance they have a much more accurate indication of demand and they peak trade in that week, even so they will need to trim and balance a day in advance of supply.

The diagrams below demonstrate the process.

Energy Purchase Timeline



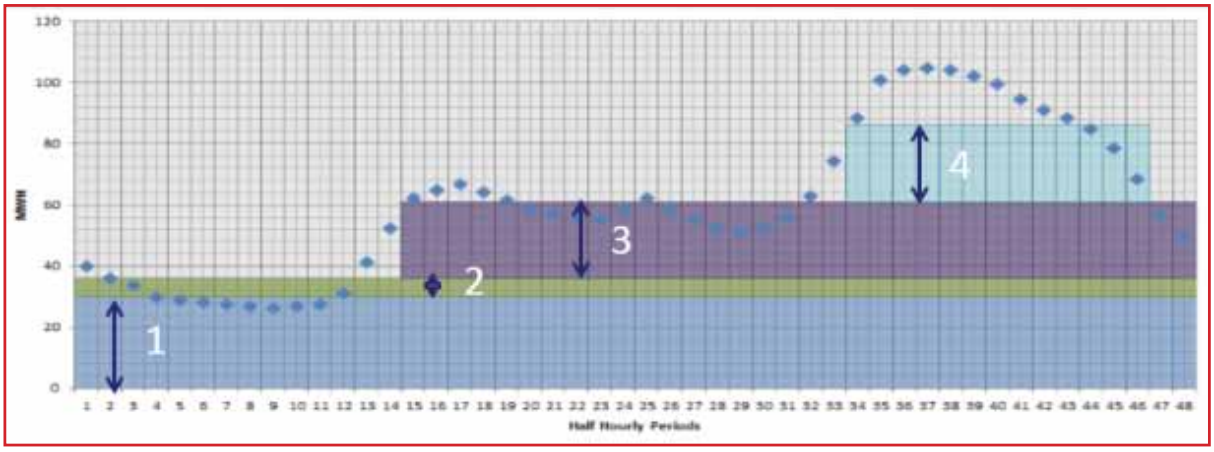


Figure x. Typical Energy Purchasing Structure

Risk

As indicated above, the process needs to be carefully managed as high balancing costs can be incurred by default. This can perhaps be best illustrated with an example. Prices for the week of 4th March would look like this in a typical purchase structure,

1. Buy Baseload Trade 1 at £48/MWh six months in advance;
2. Buy Baseload Trade 2 at £49.50/MWh three months in advance;
3. Buy Peak Trade for periods 15-48 at £52.60/MWh one month in advance
4. Buy Peak Trade at for periods 33-46 at £51.80/MWh one week in advance;
5. Trim/balance imbalance position one day ahead
6. In which case, the National Grid will buy the energy at whatever the system buy price is. In this week it went as high as £206.37/MWh

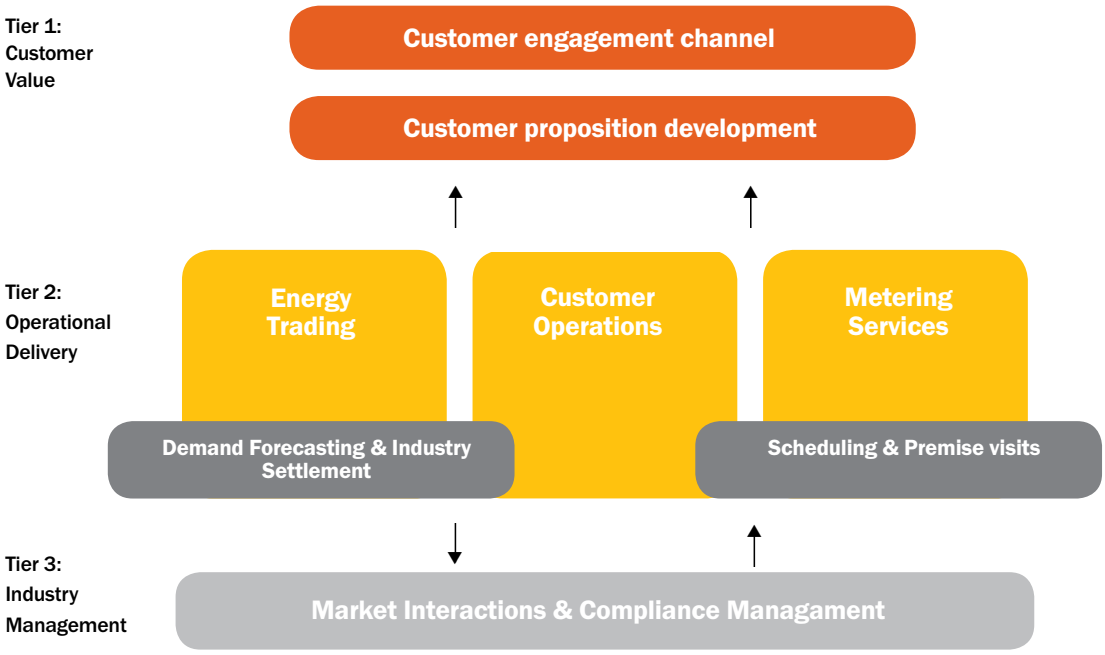
If the process is not managed, and the purchasing does not balance as near as possible, then there will be a settlement imbalance.

5 Entering and operating in the market – risks and opportunities

Energy supply management structure

Becoming a supplier in the UK market involves a range of responsibilities and risks. For an ESsCo, the key elements of the energy supply business that it would need to effectively cover are summarised in the diagram on the next page.

Figure x. The three tier model of energy supply



Cost considerations for entering and operating in the market

For new entrants to the market, there are various costs of balancing and settlement that need to be considered. These are illustrated below using a hypothetical customer base where appropriate.

Electricity

If we take a customer group of say 10,000 domestic customers consuming on average 4,000 kWh per year, their daily consumption will average approximately 110MWh at an average price of £50/MWh, that will be a credit cover/wholesale purchase cost of £5,500 per day.

Imbalance charges

As discussed above, these depend on many factors e.g. the accuracy of the demand forecast, the attitude to and management of the risk caused by fluctuating future energy prices and the system prices which are impossible to predict for any one day. However, with accurate forecasting, and adequate collateral to hedge forward prices, suppliers should expect net pricing of published markets plus up to 2-4%. For the above volume of customers, that is approximately £6,600 per month imbalance charges.

Wholesale energy costs

Forecasting wholesale costs is complex. The price depends on many factors,

- o Price set at the time of the deal
- o Future price variations may be contracted
- o Credit-worthiness of counterparties
- o Collateral
- o Hedging strategy
- o Ability to lock-in prices – how far into the future

Local Distribution Charges

The 14 regional distribution companies (see appendix B for the regions and workstream D for full cost breakdown by region) each set their own charges and costs including line costs. Each company levies its own tariff of charges. These are composed of:

- o Fixed: a pence per day charge, and
- o Volume: a pence per kWh of consumption

This typically represents about 21% of customer bills.

National Transmission Charges

National Grid is the Transmission Network Operator Single charging method which applies to all supplier and includes line costs. For domestic properties, these are composed of,

- o A demand charge per kWh, this is based on total annual demand in periods 33-48 (16:30-24:00hours)
- o A volume charge based on total consumption

This typically represents about 4.8% of customer bills.

Operational costs

These include the supplier entry and registration and other sector costs, management and operations costs, customer service costs and marketing e.g. billing, payments, taking costumers on and off, accurate information, engagement with customers. There are also the credit cover and counterparty costs which are a cash position.

Source	Small Independent Supplier	Energy Retailers Association (Big Supplier View)	Ability to control
Wholesale Energy Cost	50%	42%	Controllable to a limited extent
Energy Delivery (Transmission & Distribution including line losses	26%	18%	Standard Industry Charges - Uncontrollable
Trading, Balancing & Settlement Costs	4%	Not reporting separately. Included in operating costs	Controllable to a limited extent
Renewable Levies & Environmental Costs	3%	9%	Regulatory Charges - partially controllable
Metering Costs	2%	5%	Controllable to a limited extent
Operating Costs including Customer Service & Marketing	7%	17%	Controllable
VAT	5%	5%	Uncontrollable
Profit	3%	5%	Controllable

Figure x. Supplier Cost Stack - Public Domain Info

Options for a New ESsCo entering the market

The table below sets out in brief the requirements of operating within the supply sector and options for managing these requirements.

Role	Requirements	Options	Pros and cons
Entry	ESsCo undergoes a complex process to be registered and demonstrate that it has made provision for all the governance, financial and regulatory requirements, processes and structures of the industry.	ESsCo can at the outset buy in the mechanism and recruit staff to run their own system. ESsCo can buy/take over an existing/already registered shell supply body ESsCo can buy an entry solution/consultancy	Level of direct ownership of the brand and customer base White label opportunities Relative cost There are some off the shelf new entry solutions emerging
Compliance	Effectively and efficiently manage all the market ineractions, financial obligations and industry complexity, practice and processes	Need strong expertise to manage High level of risks if any slippage in these areas Learning period can represent make or break for a company	The options above could provide solutions but there are drawbacks in terms of long term ownership, experience and growth of the business; and when & whether to take this in house
Operations	Rapidly build up the capacity, skills, experience and team to succesfully perform all these functions and manage their business and growth	This could be done in house and totally owned by ESsCo Could partner with existing supplier Could bring in provider who covers this function (a kind of white labelling)	Level of ownership of the brand and customer relationships Business growth opportunitiees
Customer	Manage customer interface, build customer profile and business proposition and vision. Grow distinct business	ESsCo needs to own this Different delivery vehicles including partnerships with RSLs New enterprises e.g. billing, metering, payment systems	

6 Electricity Storage

Mapping current and future opportunities for electricity storage

When a shortfall imbalance occurs, the National Grid will calculate the electricity needed to balance this, and buy from whatever source can fire up quickly and provide the difference. This will be at whatever the market prices are and charges will be made accordingly. Large scale generators like hydro, nuclear and gas producers are the usual source for this. The National Grid also uses a storage process, “grid energy

storage" also known as "large-scale energy storage", and allows energy producers to send excess electricity over the electricity transmission grid to temporary electricity storage sites. These subsequently release electricity into the grid when electricity demand is greater.

Storage is needed for a variety of reasons. These include:

- The ability to effectively match generation and demand
- For a supplier to shift generated energy from off-peak times to when it is needed, and at baseload or off-peak prices.

This is needed at both grid level (large scale) and (small scale) domestic level.

At Grid level, as described previously, when a shortfall imbalance occurs the National Grid will calculate the electricity needed to balance this, and buy from whatever source can fire up quickly and provide the difference. This will be at whatever the market prices are and charges will be made accordingly. Large-scale generators like hydro, nuclear and gas producers are the usual source for this.

The National Grid uses a storage process, "grid energy storage" also known as "large-scale energy storage", and allows **energy producers** to send excess electricity over the **electricity transmission grid** to temporary electricity storage sites (peaking plants). These subsequently become energy suppliers when electricity demand is greater.

Storage technologies

For high tariff consumers e.g. prepayment meter consumers, development of effective storage solutions could enable the ESsCo to reduce the cost to them. In addition, the ability to use energy at the time it is generated (time of use) will allow more flexible and beneficial tariffs to be developed.

There are various technologies under development:

- **Storage heating and water based systems** –the technology for water based and storage heater systems are continuing to improve, these could be further developed as part of heating systems strategy including district or locality heating strategies. Some of these especially through CHP (combined heat and power) stations, can be used instead of gas, reducing CO2 emissions and 'storing' electricity in the form of hot water.
- There are many **battery** storage technologies available, however large storage units have high capital costs and will therefore have a pay-back time of many years (@10years). To add to this, conventional battery stores have a limited number of charge cycles before they must be replaced, which adds significantly to maintenance costs. Storage currently also has an efficiency of between 50-80%, depending on the technology.
- Storage units could be placed next to wind farms by generating companies to produce a consistent flow of power from the farm. The storage unit absorbs excess power during periods of strong wind and uses it to supplement the power flow during periods of calm. This increases the generation reliability, allowing it to be sold for a higher price. This, however, must be offset against the cost of the store, which can often be as much as or more than another wind turbine. This

has a very high cost and the long pay-back times have discouraged large-scale investment by generating companies.

Alternative technologies to conventional batteries are:

- **Flow-cell battery storage**. A large battery installation would usually be in the 100kW-10MW range, and would be used to help balance the electricity network as well as engaging in energy arbitrage, where energy is bought and stored at cheap off-peak rates and sold back to the grid at expensive peak times. However, they too have disadvantages:

  they have lower *energy densities* then conventional batteries, requiring more space for the same storage capacity;

  they also tend to have lower *efficiencies* then conventional batteries, typically around 70%.

- **Flywheels and supercapacitors** Low-energy, high-power storage systems such as **flywheels** and **supercapacitors** are used extensively as uninterruptible power supplies and for regenerative braking in cars and trains. Due to their relatively low energy storage potential, resulting from materials limitations, these technologies are not thought to have many applications at the transmission level, instead being used by large commercial and industrial energy consumers to maintain the reliability of power supplies.

- **Geological storage technologies**
  Compressed air energy storage (**CAES**) involves storing air at high pressure, often in a large underground space, before using it to power a turbine. It, and **pumped hydro** are larger scale, high-energy, high-power systems, capable of providing significant reserve services. They suffer, however, from significant geological restrictions, severely limiting the locations where they can be built. Neither technology is likely to be developed at a large scale in the near to medium future in the UK, although smaller-scale versions have promising prospects for distributed local storage for microgeneration.

- **Siting of large-scale storage**
  Storage technologies are generally relatively quick to build and should not require long lead times. However, storage generally has high initial costs, leading to long (over 10 years) payback times. The length of time required to recover investment has led to little interest from UK energy companies.

- **Demand-side management**
  Demand-side management (DSM) is a series of technologies that aim to match the demand of an electricity system to the available supply. DSM could be integrated with smart metering and communication to monitor available energy supply and pricing. Appliances would turn on and off dynamically to ensure demand matched available energy supply. As demand is controlled, there are no efficiency losses, unlike storage. As DSM can be rolled out gradually, the capital costs are also far more incremental than storage. Appliances suitable for DSM are water heaters and fridges, which are not affected by a short (up to 20 minutes) electricity outage.

Challenges

The current UK electricity market regulation poses the greatest challenge to the fast development of storage technologies and capacity commercially (or viably). This is because the UK's current liberalised market and the regulation surrounding it demands that each of the services is contracted separately, which means that it is not easy to group services for efficiency and risk reduction. The long payback times in a market which has the potential to change quickly and significantly over coming years has left investors wary, with many large energy companies either not investing at all or funding only extremely limited pilot schemes and studies.

The developing technologies, opportunities to create new enterprises and innovate the market, and generate economic efficiencies through the RSL consumer groupings present a real opportunity for RSL's and their partners to participate in the development of the sector.

7 Potential partnership opportunities - risks and benefits

Meeting the majority of the requirements of the balancing and settlement system can be fulfilled through systems owned either by the supplier and generator or delivered through a partnership arrangement.

In order to allow the industry participants to fulfil these obligations, a rich and complex set of data interactions (dataflows), are required. Participants must pass stringent tests which exercise these dataflows to achieve qualification before entering the market, and detailed audit checks are carried out on all participants to ensure they remain compliant.

There are a specialist providers of solutions to companies in the electricity and gas sector. The software developers provide and are developing sophisticated and highly-automated capabilities which handle the wide range of data interactions with other participants in the industry which these participants are obliged to support. The solutions can provide full compliance with the mandated rules governing participation in the market, and are therefore deployed widely by competing companies, large and small.

It is also possible to have an outsourced service capability, which carries out the task of operating its own software, such that supply companies can focus on their core task of delivering a high quality of service to their customers. Utilisoft, who have acted as expert consultants for this workstream, offer services of this type as do a handful of other providers.

How Does the Software Work?

The electricity and gas industries in the UK have collectively devised a set of data interactions and processes with associated 'choreography' which all participants must utilise and be fully compliant with. An example of this is Utiligroup's software solutions which have been written to understand and implement these interactions, with as much automation as possible to maximise efficiency, yet with the ability to alert users via workflow management whenever intervention or a decision is required.

The software in this case is modular, and may be deployed either as a whole or in part as appropriate to each customer.

Financial Structure

Castle Rock Edinvar
Housing Association

Castle Rock Edinvar Housing Association

Executive Summary

Context

This paper will assess the financial structures, implications and opportunities in respect of the proposal to establish an ESsCo as described in the Foreword.

Energy supply chain

An analysis of the energy supply chain was undertaken, specifically financially modelling a supply business, based on annualised figures and a single geographic area offering both duel-fuel and electricity only tariffs on a 5 year planning horizon.

Based on a start-up preparation period of approximately 6 months and estimating full business overhead costs, then a planned scenario, forecasting 50,000 customers over 5 years, indicates a profitable business is deliverable. Specifically, a market-leading tariff offered to low-income consumers is achievable, based on the adoption of pay-as-you-go (PAYG) smart meters. Break-even levels depend on the type of metering utilised. Staffing is assumed to be at a quite generous staff/customer ratio, compared to industry averages, and reflects the ambition to offer a pro-active and supportive service to the low-income customer base. Financing will be needed to support pre-break-even loss-making activities, working capital needs and forward energy purchases. Renewable generation, apart from being mandatory in respect of 20% of a company's supply, offers potential financial advantages in a vertically integrated supply chain. Additionally, by contracting managed services, the risks associated with executing industry protocols in a fast growing business, can be largely mitigated.

Publicly available supplier costs breakdown data indicate higher energy purchase costs and lower overhead rates quoted by the industry, when compared to the new ESsCo's forecast performance. This leads to a conclusion that industry actors, where possible, prefer to publicly present cost data, weighting allocations towards purchase and supply rather than overheads.

Opportunities

By structuring a new venture efficiently from the outset, advantages in respect of pricing, renewable energy and taxation can be captured:

- One of the key drivers behind establishing an ESsCo is the ability to offer low income consumers, immediately and in the long term, a fair and more affordable energy tariff. By controlling a supply company, this principle can be made central to the business model.
- It is a requirement that a proportion of a supply company's electricity purchases be obtained from renewable sources, and if successfully developed, then projections indicate that vertically integrated renewable generation schemes offer

the potential of strong returns, as well as security over future pricing.

- Although tax efficiencies are not a driving force in deciding the future plans of an organisation, if managed efficiently, then tax planning offers a new ESsCo the opportunity to maximise its retained value.

Financing

A new company needs a suitable and efficient financing structure put in place that meets both its short and long-term funding requirements. Key needs and associated considerations are:

- Start-up and growth finance, for which grant funding, equity or a mix of these two forms can offer a solution;
- Advanced energy purchases, which can be released by obtaining guarantees, avoiding the need to purchase all energy demands up-front;
- Working capital requirements, which can be met by either equity or loan finance, or when profitable, retained reserves;
- Although not directly related to the supply company, renewable energy capital financing can be met by bank loan finance and equity.

Partnering

Collaboration opportunities with other companies should be viewed positively. However they should be tested against the new company's adopted founding principles and subsidiary objectives, which act as the over-riding priority within the organisation.

1 Purpose of Paper & Approach

The purpose of this paper is to assess the financial structures, implications and opportunities in respect of the proposal to establish an ESsCo as described in the Foreword.

The approach taken has been to:

- Undertake a financial modelling exercise to understand and test the energy supply chain from energy purchase to customer supply;
- Consider opportunities available, both in respect of conventional supply and renewable generation, in order to achieve the social objectives of the project;
- Consider financing options in respect of launching a new ESsCo;
- Consider partnering with another ESCO as opposed to launching a new company;

The preparation of this paper has been informed by the author's and RPE's own experience in business modelling and alternative financial structures, by specialist support from energy industry experts; and from tax experts on points of detail.

2 The Energy Supply Chain

Detailed approach

This supply chain and financial modelling analysis relates to a single geographical area, utilising industry quoted cost data from that region and publicly available regulatory system charges, to assess an annualised core cost chain and extrapolate to a scaled operation, assuming that regional differences will be compensated for by adjusting tariff rates.

This approach is based on the fact that there are numerous gas and electricity 'regions', each with different defined distribution and transmission charges, line losses and other specific costs. Customer tariff levels are set by supply companies to correspond to these variations, thus a 'single tariff' from a supplier will adjust from region to region to allow for these differences in the supply chain.

The financial modelling assumed a single customer location, a competitive tariff rate offered by 'U-Switch', and a mixed customer profile of dual fuel (gas and electricity) and electricity only, over a 5 year planning horizon.

Cost assumptions have been drawn from industry data (both published and available within the industry – for example costs of wholesale energy). The resulting projections and associated logic have been checked closely with industry experts. This has enabled indicative conclusions to be drawn as to future potential. Following this piece of work, prospective next steps are to develop a full business plan and associated financial model to consider more closely the case of setting up an ESsCo. A final business plan would be based on a favoured business model and incorporate:

- Detailed strategies in respect of all parts of the business, including renewable energy, taxation and financing;
- Finer detail in respect of cost assumptions, incorporating regional data and modelling to a monthly basis.

The supply chain

The energy supply chain modelled is made up of the following elements:

- Cost of wholesale energy, with additional allowances for:
  - o Electricity - line losses, trading charges, balancing and settlement costs and other market and regulatory costs;
  - o Gas - trading, broker and shipper charges.
- Distribution and transmission costs for both gas and electricity
- Renewable and green obligations/levies
- Metering costs
- Managed industry service
- Customer acquisition
- Staff costs

- Overhead costs (premises/infrastructure/IT costs/overheads)
- Marketing

Start-up phase

The model assumes a 6-month pre-trading start-up phase, that includes the following elements:

- Energy company accreditation;
- Staff and overhead costs;
- Marketing;
- Customer sensitisation;
- Website;
- Legal costs.

The above costs do not include detailed business planning requirements, prior to launching the start-up phase.

Planned scenario

The business projects a staged increase over 5 years to 50,000 customers and assumes that tariff levels to customers will match locally competitive rates, regardless of meter type and payment method.

It projects a net profitable position is achieved within the five year period, even taking into account the new ESsCo's growth profile and potential high costs of customer acquisition. Assuming that the customer base reaches a 'steady state' at 50,000 customers, then net profitability of between 3% and 4% is indicated.

Break-even

The financial model considered customer levels required for an organisation to becomes operationally profitable, returning an annual net profit, in a 'steady state' scenario, incorporating a reasonable cost for customer churn and the different meter types available.

The analysis indicates that a traditional 'dumb' meter has the lowest break-even level, with new straight and pay-as-you-go smart meters also breaking even at higher levels, well within the 50,000 test case.

In order to impact on pre-payment customers tariff levels, the preferred pay-as-you-go meter type has been adopted. It is not feasible to match a market-competitive tariff using existing current pre-payment meters due to the high annual rental and running costs.

Staffing

Based on the projected growth profile of the ESsCo, reaching 50,000 customers in year 5, a decreasing customer : staff number ratio is predicted, indicating that economies of scale are achieved for staff costs as the business grows.

Considering a new ESsCo, with a focus on maintaining a supportive contact with its customer base, a fairly low ratio in respect of staff : customer numbers has been adopted.

Cashflow and required financing

Projected cashflows indicate that finance is needed to support the growth profile. The required financing is further broken down into supporting start-up activities, working capital needs, and advanced energy purchases:

- Start-up period - To fund pre-trading and loss-making activities;
- Working capital - To fund the terms of trade of the business;
- Forward energy purchase or guarantee
    - o The level of forward cover depends on how reliable the trader or vendor of the electricity views the purchasing ESsCo:
        - If the ESsCo is viewed as a good credit risk - then the trader may only need security over the potential change in the electricity price. Taking out forward cover for this on the financial markets would enable the new ESsCo to hedge its position and only need security to cover the margin of risk attributed to the future pricing;
        - A new ESsCo will not have a strong balance sheet to enable it to be viewed as a good credit risk, and thus will likely be expected to settle in advance any future energy purchases; and
        - An option could be for a new business to find a third party guarantor for its future energy purchases.
    - o As the business grows, it should settle on a future buying strategy, and may choose to guarantee more than 2 months in advance to give security to its supply;
    - o Energy industry regulations require that at least one month's future energy is secured, or equivalent security lodged with the industry body Elexon.

Managed industry services

The business model assumes that the new ESsCo contracts managed services to handle its industry specific administration requirements. The alternative would be to invest in a full system and recruit an associated team from the outset. This would be both expensive and may increase the risks to the new company.

The planned scenario includes indicative costs for contracting such a service from a leading industry provider. These represent an initial offer and are prior to any scrutiny and negotiation. Apart from a minimum payment level, applicable during the early start-up phase, these are charged on a monthly per customer basis, that reduces as scale increases.

It is expected that once scale is reached, the option to bring these services in-house would be considered.

Renewable energy and environmental obligations

Any energy supplier in the UK is required to source a percentage of its energy supply from renewable sources - currently this stands at 20.6%. If it does not, then an industry charge is made to 'buy-out' this obligation, however this attracts a premium that is greater by approximately 60% than that for purchasing on the market.

The forecast supply chain adopted in this paper assumes that a new ESsCo will comply with this obligation by purchasing its required renewable energy directly and not pay the industry 'buy-out' price.

Additionally, although not included in the planned scenario, there are potentially profitable opportunities available by successfully developing renewable generation and vertically integrating these schemes into the supply side business. This aspect is considered in greater detail in section 3.

Cost stack comparison against other suppliers

Publicly available information outlining a number of suppliers breakdown of costs and profits were analysed and compared the new ESsCo's projected cost stack. The ESsCo model for comparison purposes was run assuming an electricity only tariff and at a customer volume of 50,000. At this level, cost groupings were compared to industry published figures.

The comparison indicated broad similarity, with the exception of two areas:

- Energy purchase/trading/settlement costs appear lower than industry norms; and
- Overheads appear higher than industry norms.

Given the fact that the cost of wholesale energy and associated costs can be confidently estimated, when looking at annual averages, and the fact that overheads have been closely costed, it is viewed that the difference evidenced, may be one of allocation or even 'presentation'. Some overhead costs may be allocated as supportive of energy purchasing, and so included in this cost grouping. Additionally businesses may wish to 'present' a low figure for overheads - to give the impression of efficiency.

3 Opportunities

Pricing policy

A key driver behind potentially establishing an ESsCo would be to offer low income consumers a fair and more affordable energy tariff. By controlling a supply company, this principle can be made central to the business model.

The planned scenario described in section 2 indicates that a supply company could

offer a market competitive tariff (regardless of meter type or payment method) to low-income consumers. under a pay-as-you-go offer, fitting with RSL tenants' desire to have a more cost effective energy supply whilst retaining the ability to make small, frequent payments and avoiding getting into debt. However such a competitive offer would not be possible under a current pre-payment meter format, which will represent the current meter many customers are currently using.

The cost to the supply company of offering a PAYG meter is greater than that of a standard dumb meter, but less than a current prepayment offer. It would also involve extra effort successfully converting new customers from prepayment meters. However, given that meeting low-income consumers' needs are a key driver, then it appears that there is a real opportunity for the new company to offer a market competitive price, as long as the legal structure and financing strategy are aligned to ensure forecast margins are not eaten up by investor returns and finance costs.

Renewable energy

As explained in section 2, there is a requirement for any supply company to source around 20% of its energy from renewable sources. As well as meeting this demand, there are opportunities available to a new ESsCo, in establishing its own renewable generation activities.

Creating a vertically integrated supply chain through the generation of renewable energy would offer price security to the ESsCo in respect of energy generated. Given that future energy prices may increase, then any renewable generation schemes successfully developed would offer the new ESsCo price security in respect of energy generated.

Although not modelled directly in the planned scenario, there are potential profitable opportunities available to the ESsCo, by successfully developing renewable generation, surplus profits could be delivered, whilst also selling the energy under a Power Purchase Agreement to the supply business at an agreed price to meet its renewable energy needs.

The potential to generate surplus profits does not count the cost of failed planning applications, other investors diluting returns or the effort required in raising necessary finance.

In summary, it is a requirement that renewable energy be sourced by any supply company, and that projections indicate that vertically integrated renewable generation schemes offer the potential of additional returns, as well as security over future pricing.

Taxation

Saving tax should not be a driving force in deciding the future plans of an organisation, however if managed efficiently, then tax planning offers a new ESsCo the opportunity to maximise its retained value.

Some examples of areas that may be of interest/general points of opportunity to bear in mind, when considering, in respect of taxation are as follows:

- Supply Company
  - o Corporation tax - Should the ESsCo be established as a social enterprise, with no shareholders and limited by guarantee, with primarily charitable objectives, then there may be an opportunity to negotiate with the HMRC to obtain exemption from corporation tax, in the same way as a charity would. This is not a certain conclusion, however advice given indicates that it would be a possibility.
  - o Care should be taken in making payments from associated energy projects, as for expenditures to be allowable, they need to be linked to the trade of the business.
  - o Investment income in the form of grants will likely be liable to taxation, however loan income, although incurring an interest charge, will be available to reduce chargeable income.
- Renewable Generation Scheme
  - o Good capital allowance reliefs are available in respect of capital expenditures if the developer has an interest in the developed land.
  - o Interest on long-term capital loans can be 'rolled-up' and offset in advance against income.
  - o Dividends payable are not subject to tax if from post taxable profits.
  - o Capital gains made on developments are not taxable if the development is held for greater than 12 months.
  - o Establishing the scheme as a limited liability partnership (LLP) could offer some advantages, however these would need to be considered separately at the time of inception.
  - o If the joint venture is with other investors, then:
    - These can be made more attractive to those joint parties through enterprise investment scheme (EIS)/venture capital trust (VCT) reliefs available for ROC sized schemes (greater than 5MW).
    - Should the generation scheme be set-up as a Community interest Company (CIC), then EIS reliefs would also be available for FIT sized schemes (less than 5MW)

The above gives some indicative pointers, in respect of opportunities available in respect of efficient tax planning. However detailed tax advise should be sought, once there is clarity as to the organisation's chosen business model.

4 Financing

Finance needed

As is described in section 2, finance is required to support different needs of a newly launched ESsCo:

- Start-up and growth finance to cover unfunded expenditures until a break-even level is attained;
- Forward energy purchases; and
- Other working capital needs.

Additionally if considering setting up renewable energy schemes, then capital financing is also required.

Sourcing finance

The type of finance that can be sourced will depend greatly on the type of organisation and founding principles that its founders choose to establish it under:

Donor/Grant funding

- Should the new ESsCo be established with social objectives as its primary drivers, then donor/grant funding becomes a serious option for consideration. This is the case for both start-up funding and also in respect of ensuring there is adequate working capital in place to allow planned growth to occur.
- Even if the business has a primary profit motive - then there may still be the option of 'subsidised' funding in different forms, as long as forecast direct social impact can be demonstrated.

Equity funding

- Conventional equity finance will be available from potential investors, depending on levels of return forecast and associated risk indicated by plans.
- Should the venture have clearly forecast social/environmental impacts, then the newly emerging equity class of 'impact investors' may be appropriate to fill finance gaps. Impact investors will only invest in businesses with a social/environmental 'win', however will normally expect a traditional financial rate of return and exit strategy.
- From the 'straight' impact investor, expecting a standard financial return, there is a sliding scale in respect of 'philanthropic' and 'ethical' investors, who will reduce their financial expectation, depending on the level of ethical return forecast. These investors are often attached to charitable bodies, and may have their own 'directed' investment funds. These will have defined ethical objectives and 'flexible' expectations in respect of reduced financial rates of return and 'patience' in respect of lengths of period before repayment.

Debt and other forms of finance

- Debt comes in many types, from simple loans and overdrafts, to detailed arrangements, targeted to specific aspects of a business' operations.
- Additionally, other forms of finance, like guarantees from third parties, enable flows of finance to occur, where security is needed.
- As with equity, ethical financiers also offer debt finance, sometimes with preferential terms and conditions.

Retained reserves

- Once the new company begins generating profits, then reserves that are not distributed, but are retained in the organisation, inherently act as a financing source for the company.

Specific to the launch of a new supply company, and its identified needs, the following consideration is concluded:

- Requirements for **start-up and growth finance** should look to grant funding, equity or a mix of these two forms. If the venture has primarily social objectives, then grant funding may be available. Additionally, given the social intention of the organisation, then impact investment funds should look favourably at investing in the new company, especially if forecast social or environmental impact can be

demonstrated.

- **Advanced energy purchases** make up the largest element of required funding as the business grows. Energy traders and vendors will look for security in respect of orders made and not expect full payment in advance, unless they do not have confidence in the credit-worthiness of the purchaser. Thus obtaining guarantees for energy trades will likely be the most efficient and least expensive form of accessing credit from vendors of wholesale energy.
- **Working capital requirements** are mainly in respect of network costs. Either equity or loan finance should be sought to meet this need. However once the business becomes profitable, the retained reserves will begin additionally supporting working capital needs.
- Although not directly related to the supply company, **renewable energy capital financing** has fairly mature market expectations, attracting in competitive bank loan finance for up to 90% of the capital costs as long as the remaining funding can be found from equity sources.

In general it is advisable to design a financing structure that has the capacity to meet short-term and longer term needs, as the business grows; is not reliant on any one form of finance; and offers good value for money.

5 Approach to partnerships

The establishment of a new ESsCo will be based on agreed and adopted founding principles. These founding principles will act as a guide and check for all levels of the organisation. The principle of partnering with an another organisation will be totally dependent on how any collaboration enhances/accelerates the achievement of these founding principles.

Thus collaboration opportunities should be viewed positively, however tested against the new company's adopted founding principles and subsidiary objectives, which act as the over-riding priority within the organisation.

Payment methods

Grampian Housing Association

Grampian Housing Association

Chapter Summary

For many low income customers, paying more for their electricity is a fact of life because they use prepayment meters (PPMs) or pay in small cash instalments. This allows them to control their expenditure on energy and avoid getting into debt, but at a price. Paying in this way usually means they:

- have the highest tariff costs of all available tariffs
- have the inconvenience of having to leave their homes to "top-up";
- pay more in transaction charges, and
- may self-disconnect when they are not able to "top up"

Energy costs are a critical factor in identifying fuel poverty[9], where households need to spend in excess of 10% of their income to maintain a satisfactory heating regime. Official Government policy since the late 1990s has been to tackle fuel poverty, though the fuel poor have been the least likely to benefit from any drop in fuel prices[10]. Despite repeated government policy and energy supplier initiatives, those who can afford to pay least for their energy still pay the most.

There are a number of recent developments that could transform the costs of providing energy services to low income customers. The most significant of these is the roll-out of '2nd generation' smart meters, which will be more flexible and convenient for the customer, allowing them to top-up remotely from home, and will be less expensive to service for the supplier.

In addition to the roll-out of smart meters, the range of pre-pay options in a number of services is likely to expand significantly providing other options. These include mobile phone payments and pre-paid payment cards which can be aligned with other financial transactions including receiving and withdrawing cash, direct debit payments and (depending on supplier) free cash withdrawal. While it is clear that these accounts, payment cards and associated benefits will not be free, they may be significantly cheaper than the current options for paying for energy. Cash handling remains an expensive option and there was little appetite amongst RSLs involved in this Warm Homes Fund project to provide a cash payment facility for energy supply.

The consumer credit requirements for an ESsCo providing credit services credit and debt collection services, would not be onerous and should not present an obstacle for an RSL ESsCo.

Although generally low income customers do not tend to switch energy supplier, a small survey of RSL tenants undertaken for the feasibility study for this project indicated a high level of awareness of the option of switching and that a high

9 Defined as spending more than 10% of household income on adequate heating
10 Boardman, B. (2004) New directions for household for household energy efficiency: evidence from the UK. Energy Policy 32 (2004) 1921-1933

proportion of tenants had done so. Both the literature review and the survey indicate a degree of consumer scepticism about energy suppliers. However, many of the tenants who took part in the survey, who tended to have a positive attitude towards their landlord, approved of the idea of their landlord becoming an energy supplier as long as this did not increase costs.

1 Introduction

Consumer Focus published research[11] in 2011, exploring the costs and implications of money management for low-income consumers, indicated '*that the precariousness of low-income consumers' finances and personal circumstances meant that they often have to prioritise control (predictability, without hidden fees or penalty charges), clarity (easy to understand terms and conditions) and convenience (easy access and limited barriers) over long-term cost. .... they cannot afford to take the risk of the fees and penalty charges for missed payments that come with more mainstream products. Instead, many low-income consumers rely on more expensive payment methods and financial products, such as cash, certain types of credit (eg home-collected credit, payday loans) and prepayment meters (PPMs), which are better suited to their priorities for day-to-day money management.'*

The report emphasized *'that low-income consumers' choices are based on an active weighing up of the costs and benefits of the products they consider available to them. Often this means having to make difficult trade-offs between cost and other priorities, given the limited choices on offer. By choosing sound financial management with the aim of avoiding debt, low-income consumers' priorities can result in expensive choices. Making sensible decisions for their financial circumstances can actually increase low-income consumers' poverty premium and vulnerability to debt.'*

This is borne out in the way many low income households pay for energy, using a PPM or card top-up (cash). Paying for energy in these ways incurs the highest tariff costs for the customer and compares poorly to tariff rates available to direct debt customers. However, PPMs, are the preferred option for some because, they allow customers to manage their budget, to avoid getting into debt or to repay an existing debt. The trade-off is that customers may then:

- pay more for their energy
- have the inconvenience of having to leave the home to "top-up"
- 'lose' an additional amount each time they top-up to repay any debt
- may self-disconnect so that energy is available when they know they will need it most, and
- may go without energy completely when they do not have funds to top-up their PPM card or cannot get to the top-up point.

For an ESsCo focused on low-income customers, where the likelihood is that large numbers of customers have PPMs, finding cheaper and more user-friendly payment methods is key to providing a more cost effective service and improved customer experience. The costs associated with PPMs and card top-up payment methods are

11 http://www.consumerfocus.org.uk/files/2011/09/making_ends_meet.pdf

one of the factors responsible for the higher charge to customers, and identifying alternative payment methods which reduce these costs will be critical to the profitability of the ESsCo.

2 Aims & Methodology

The aims of the workstream are:

- To scope out the costs of current prepayment top-up methods
- To scope out the costs of 'transaction charges' for cash payment such as paypoint, Post Office, and other suppliers
- To scope out alternative payment methods, for example phone top-up, bank top-up, card top-up where money could be put on a card and then used to pay a range of bills and the costs associated with these methods
- To undertake research into customer attitudes to different payment methods
- To explore the potential for RSLs to be a payment point for energy payments and PPM top-ups and the potential role of RSLs in debt collection
- To consider the strategies available to deal with households in crisis or default
- To explore opportunities to work with others to improve the offer to customers and reduce transaction costs
- To consider the Financial regulations and Consumer Credit Act implications.

In producing this report, desk-top research was undertaken, along with research with industry experts in payment methods and in the energy sector. The report draws on two papers produced specifically for this Warm Homes Fund project by academic staff at Robert Gordon University. The first considers fuel poverty, choice and the poverty premium[12]. The second is qualitative research and explores attitudes to energy purchase amongst Scottish RSL tenants. This was undertaken with tenants from Grampian Housing Association and Castle Rock Edinvar[13]. Both the Robert Gordon University papers are available on request. This report, on payment methods for low income customers, relates closely to the Smart Meter workstream, Regulatory Framework workstream and the Financial Model workstream.

3 The costs of current prepayment top-up methods

Background

The UK energy market is one of the most advanced deregulated markets in the world. However, evidence suggests that poorer customers have benefitted little from this. Fuel

12 Attitudes to Energy Purchase by Scottish Housing Association Tenants, Mary Brown and Seonaidh McDonald, Robert Gordon University, April 2013a

13 Warm Wishes: fuel poverty, choice and the poverty premium for disadvantaged customers – a comparison of the academic literature since the beginning of the twenty-first century, Mary Brown and Seonaidh McDonald, Robert Gordon University, April 2013b

poverty, where a household needs to spend in excess of 10% of its income to maintain a satisfactory heating regime[14], remains a problem, and poorer households may pay a "poverty premium"[15].

Despite repeated government policy and energy supplier initiatives, those who can afford to pay least for their energy still pay the most, usually because they find themselves on expensive PPM tariffs or because they do not have a bank account to pay by direct debit. Official Government policy since the late 1990s has been to tackle fuel poverty, though the fuel poor were the least likely to benefit from any drop in fuel prices[16].

In 2001, the UK Government's aim was to eradicate fuel poverty amongst 'vulnerable' groups by 2010 - that is amongst households including older people, disabled people and children - and to eradicate it in the general population by 2016. It failed to meet the 2010 target[17]. Other problems which affect these customers, as identified by consumer advice website theenergyshop.com, include:

- Most billing is based on usage estimates, unlike in many other countries where meters have been read by radio signal for decades and bills are always based on an actual reading.
- The time it takes to switch, though the legal requirement is that suppliers should take no longer than three weeks to process a new customer it still takes longer.
- Suppliers can charge customers for leaving, though this may be fair for fixed rate tariff customers, the application of these penalty rules is not uniform or transparent.

Academic research on this subject includes in depth discussion of what are the predictors or indicators of fuel poverty and who is "vulnerable"[18]. Attempts to identify those at risk of fuel poverty have examined geographical and socio-economic factors. A study of Scotland's fuel poor indicated that a combination of social and political factors could predict fuel poverty. Census variables were a factor: unemployment, lack of access to a car, absence of central heating, being a lone parent or single pensioner, having a disability or renting from a private landlord; but so were household income and the condition and location of accommodation[19]. The key characteristics of those using prepay meters are typically of people on low incomes and living in rented accommodation[20] . The lowest income families have been hardest hit by energy costs and have periodically had to make decisions about paying for either energy or food[21].

14 Definition proposed by the Department of the Environment, Transport and the Regions 2001
15 Poverty Premium identified as £1,280 in 2010, Consumer Focus http://www.consumerfocus.org.uk/publications/making-ends-meet
16 Boardman, B. (2004) New directions for household for household energy efficiency: evidence from the UK. Energy Policy 32 (2004) 1921-1933
17 DEFRA/DTI 2001, cited in Waddams Price et al, 2006
18 Brown and McDonald, April 2013b, op.cit.
19 Morrison, C., and Short, N. (2008) Fuel Poverty in Scotland: Refining spatial resolution in the Scottish Fuel Poverty Indicator using a GIS-based multiple risk index. Health & Place 14 (2008) 702-717
20 See, for example, Mummery, H. and Reilly, H. (2010) Cutting back, cutting down, cutting off. Consumer Focus
21 Ibid.

The cost of 'transaction charges' for cash payment

Research undertaken by RPE has shown that there is little doubt that the costs of servicing PPM customers is greater than, for example, direct debit payment customers. Cash payments are an expensive way of receiving payments. Indeed, cash payments are a current issue for many of the RSLs involved in this project because of the end of direct payments of Housing Benefit from the local authority to landlords. Faced with increased numbers of tenants paying their rent rather than local authority direct payments, most RSLs are trying to move away from receiving cash payments, because of the costs associated with cash handling.

Current prepayment meters require a mechanism to 'top-up'. This involves a customer making relatively small and frequent payments to a smart card or key and, often paying in cash. Processing is undertaken through third parties such as Pay Point and All Pay, i.e. by payment collection companies. Pay Point for example, has cash payment handling facilities through other third party organisations such as corner shops, where PPM customers hand over their cash and have their card or key 'loaded' with the amount paid, which they then feed back into their meter. Where the customer wants to top up using a debit card, there is frequently an additional bank transaction fee taken by the store. All of this is a costly and time-consuming process for both the supplier and customer.

RPE research indicates that the costs for using a cash handling agency can start at 23p per transaction plus 10% of the value of the transaction, for a minimum of 100k transactions per year. The costs reduce as the scale of transactions increases settling at around 3% of the value of the transaction for high numbers of transactions. All of these costs must be recouped from the customer.

In addition to the cash handling/transaction costs, there are the financial costs of 'dumb' PPMs, that is of existing or old style PPMs, including that they are:

- more expensive than other types of 'dumb' meter
- more likely to need an intervention (for example if the card amount has not loaded correctly on to the meter) than simpler meters, which involes additional costs.

4 Developments in payment methods

There are a number of developments that could transform the costs of providing energy services to low income customers. The most significant of these is the roll-out of smart meters, which is covered in detail in the Smart Meter workstream report. Smart meters will be more flexible and convenient for the customer, allowing them to

22 Smart pre-payment in Great Britain, Gill Owen and Judith Ward, Sustainability First, March 2010
23 Ibid.

top-up remotely from home, and will be less expensive to service for the supplier. The range of pre-payment options offered generally is likely to expand significantly. Pre-payment has become standard across a range of sectors: pay-as-you-go mobile tariffs represent over 60% of mobile phone contracts in the UK, Oyster cards allow advanced and more favourable payment rates for public transport in London, payment cards are increasingly available for travellers abroad (in place of travellers cheques) and for parents administering a budget to their children for shopping online[22].

In Northern Ireland a pay-as-you-go utility scheme, using a 'Liberty Keypad meter', has successfully provided a mainstream way to make energy payments. This is a more convenient way of paying and has removed the stigma associated with PPMs. By mid-2009, 30% of all utility customers in Northern Ireland were using the keypad PPMs, with new connections continuing at a rate of 2,000 per month. Fifty- eight percent of customers are on low-incomes, but a significant proportion, 32%, are on middle or higher incomes. The increased convenience has been key to its success, though other factors have contributed including discounted tariffs and "friendly credit" which helps avoid disconnection[23].

Other developments within the financial services sector are mobile phone payments and pre-paid payment cards which can be aligned with other financial transactions, including receiving and withdrawing cash, direct debit payments and free cash withdrawal. While it is clear that these accounts, payment cards and associated benefits will not be free, they may be significantly cheaper than the current costs of paying bills. Pre-paid cards and accounts are being explored from a policy development perspective by the Payments Council, which has responsibility for ensuring that payment services work in the UK[24], and are being developed by individual service providers. Examples of these are Think Money (see www.thinkmoney.co.uk) and CashPlus (see www.mycashplus.co.uk/get-a-card/pricing.aspx), though it should be noted that the transparency of costs and costs charged by each service provider vary hugely. Some appear not to meet Consumer Focus recommendations for financial products targeted at low income consumers.

Another option to be explored is through mobile phone providers which receive payments through their pay-as-you-go service, and can 'disaggregate' this money and make payments to pay other services. This is still in the very early stages of development and it has not been possible to confirm costs at this point.

For policy makers, governments and other organisations, there is a pressing need to identify the most cost effective way to receive money and make payments. The introduction of Universal Credit and other changes to the benefits system which effect people on low incomes, including the end of local authority direct payments of housing benefit to the landlord, and the personalisation agenda, make this a key issue for low income households and organisations that provide services to them.

24 http://www.paymentscouncil.org.uk/media_centre/press_releases/-/page/payments_council_launches_consultation_on_national_payments_plan/

5 Customer attitudes

Literature review

There is a range of literature on customer attitudes to payment methods. A 2010 Consumer Focus report, *Cutting Down, Cutting Back, Cutting Off*, looked at PPM users and how they managed their energy costs. The report showed that customers valued PPMs because they believed they helped them to budget on a greatly reduced income, often following the accumulation of debt on their energy bills. However, the customers recognised that they might well be paying more per unit for energy used in this way, and were frustrated at times by the inconvenience of 'topping up' the PPM which could only be done at a shop or Post Office, rather than conveniently as with a mobile phone. Although energy companies are not allowed to disconnect vulnerable customers in winter, the report found that these same vulnerable customers were often disconnecting themselves, and the poorest households remained disconnected longest. Individuals had become very aware of the energy usage of household appliances and would make choices between heating and using the cooker to make hot food, often to the potential detriment of health.

Attitudes to payment methods

The small qualitative survey of RSL tenants in Aberdeen and Edinburgh, undertaken by Robert Gordon University for this scoping exercise, canvassed tenants views on:

- Methods of paying for their energy costs,
- What, if anything, had been their experience of switching energy supplier, and
- What they thought of the idea of the RSL becoming an energy supplier.

The research showed that a significant number of respondents, 15 of 34 (44%) had PPMs either because they had accrued arrears or because the PPM was already in the property and they could not afford the cost of changing back to a 'dry' meter. The rest had direct debit or standing order arrangements, usually paying monthly. Seven people were awaiting quarterly bills, but there were various reasons given for this: 'I shared the house with my mother who died recently and I'm waiting to check my consumption as a single occupant before I set up a new direct debit.' 'My winter fuel allowance pays for any additional use over winter.' Several people were pleased with their relatively low heating bills, suggesting that their property was energy efficient.

The PPM customers all said that paying in this way was not inconvenient as shops or Post Offices were usually close by. One person who had a disability could still get to the shop but if he was unwell his sister or a neighbour would go for him. Most topped up the card weekly or fortnightly, although some said they had noticed they were topping up more often in the wintry weather. Most had not been disconnected – the emergency £5 on the card usually covered their needs, although one tenant was convinced that she was charged more for her power if her card 'went into the red'. Another commented, 'it's happened a couple of times with the gas but I can use an electric heater if the electricity is still on.' Others claimed: 'If it happens at night we just go to bed early", and, 'I just lie on the couch with a coat over me.'

The advantages of PPMs in terms of budgeting appeared to outweigh their drawbacks, which were seen as the fact there could be 'hidden costs' and the inconvenience of having to go out to top up the card.

Eight respondents, including people using PPMs and people paying by direct debit, had faced the situation of having to choose between 'heating and eating'. They mentioned having to budget very carefully, especially when unemployed or on a low wage.

6 Switching

Literature review

Low income customers are generally less likely to switch supplier than those who are better off. This is for a variety of reasons.

In 2010 Consumer Focus found that not only did customers not understand their bills, they did not trust what the energy suppliers were telling them. There was widespread mistrust and negativity towards the energy suppliers in the 2010 survey, one respondent commented 'they are all in it together to make money'. This view had remained a common one when Consumer Focus followed up a 2009 study[25] and explored customer experience of switching energy supplier in 2012. In the 2012 research[26] consumers suggested that suppliers were liable to 'act as a pack' in terms of pricing, so switching would be unlikely to result in significant price differences. Vulnerable customers in particular reported confusion and distrust of the whole process, claiming they would not undertake it again. Few had undertaken online price comparisons although saving money had, as in 2009, been the biggest motivator. There was still a general belief that suppliers did not keep their promises and their customer service was often poor. A very recent report by the Energy and Climate Change Select Committee (House of Commons, 2013) refers to 'sticky' customers who are still unwilling or unable to switch suppliers, and recognises that these people, especially if they are in vulnerable situations, may be subsidising cheaper deals for others who are more 'engaged'.

A 2002 report[27], produced not long after the UK government's 2001 fuel strategy, and at a time when utility bills were still falling, noted that falling prices were only in part brought about by market competition driving down prices. It suggests that consumers were initially reluctant to exercise choice, despite or perhaps because of the aggressive campaigns by suppliers, as noted by www.theenergyshop.com.

The 2002 report examined the process of paying for energy through a customer behaviour perspective, suggesting that for many customers there was a difference between paying for energy and other convenience goods. Unlike the latter, energy is regarded as intangible, something which is continuously supplied, and a product which cannot be differentiated (although they fail to mention that 'green' energy may

25 Faulk, A. (2009) Switching Off: Attitudes to switching energy suppliers among disadvantaged customers. Customer Focus Scotland
26 Anon (2012) Switched on? Consumer experiences of energy switching. Consumer Focus
27 Watson, A., Viney, H. and Schomaker, P. (2002) Consumer attitudes to utility products: a consumer behaviour perspective. Marketing Intelligence & Planning 20/7 (2002) 394-404

be relevant in this context, arguing that customers liked the idea of it, but not if it came with additional costs). Consequently, the report argues, the only basis of energy competition is price and service. As long as customers are reasonably satisfied, and bearing in mind the complexity of the switching process at the time, and which has not significantly changed over the period, they probably will not switch. Brand loyalty to a supplier also existed, and those on low incomes were less likely to switch, especially as lower-cost options were at the time less likely to be available to them.

A 2009 report[28] notes respondents, who were very aware of who supplied their energy, had investigated or made use of the cost saving offered by a 'dual fuel' option. However, respondents tended to report difficulty in understanding their energy bills, and problems in contacting suppliers, especially where automated phones are used, and although cost savings were often stated as a reason for changing supplier, they were by no means likely to switch. Reasons for sticking with the current supplier ranged from past experiences of 'doorstep selling' of the sort described by www.theenergyshop.com, which had left many unable to trust the information suppliers were providing, as well as pressure from the current supplier to remain, to high fees from the current or potential supplier, especially where PPMs existed. Cost savings were often a reason for changing supplier, but it was usually a reactive decision when fees had increased, or following an approach by a salesperson, rather than a proactive price comparison. The issue of poor supplier communication has been addressed up to a point by a Consumer Focus guide to energy bills and payment 'Staying Connected' (2012) which is sent out by the energy suppliers and is written in clear English.

RSL tenants views of their energy supplier and switching

The Robert Gordon University survey indicated that:

- The participants were well aware that it was possible to switch energy supplier and the way they paid for energy;
- 20 out of 34 respondents had switched supplier, although several had found the process complex and found the suppliers' promises were not always kept, and only two had done an online price comparison;
- The main reasons for not considering switching again were the 'hassle factor' and customers' feeling that they had been 'ripped off' by some energy suppliers;
- Views of supplier customer service ranged from very good to very poor;
- A significant number (11 out of 34) kept the heating on all the time, usually for health reasons, or because the property did not effectively retain heat;
- The majority paid for their energy though pre-payment meters (PPMs) and whilst they were aware that they may in fact be paying more for energy, PPMs were preferred as they helped people to budget whilst on a reduced income;
- Most PPM customers had never run out of credit and been unable to pay for reconnection, but often this was because they were able to borrow from family and friends. Equally, several people reported having to choose between 'heating and eating' on occasion;
- Only two people had heard of smart meters but there was unanimous approval of the idea, and most were happy to have one installed as long as they were not presented with significant installation/switching costs;

28 Faulk, 2009, op. cit.

- Cost was the main reason for considering switching supplier, together with trust of the supplier. Many people reported gratitude for the help provided by their RSL and claimed they would welcome the idea of the RSL becoming an energy supplier.

Unlike in the literature review, a high proportion of tenants, (20 out of 34) had switched energy supplier. This may be because the RSLs have staff who have advised and assisted tenants, though establishing this would require further investigation. Several of the sample had switched more than once and two had consulted online comparison sites, again in contrast to the findings of previous literature. When people could not switch this was because of high costs – usually to change meters from a PPM back to a 'dry' meter, although in some cases the RSL had helped the tenant negotiate a way forward in these situations. Tenants reported considerable variations, several companies, in particular Scottish Hydro Electric, were thought to offer good customer service to RSL tenants.

The majority of tenants who participated in the survey were aware that it was possible to switch energy supplier or payment arrangement. Of the 20 who had switched, only a couple described the process as 'painless'. In other cases the switch had taken too long – one tenant was told she could not switch from Scottish Gas as she had arrears of £14. In that case, CRE, the RSL, had sorted out the problem and managed to get her £50 compensation. Others commented 'hassle', 'never again', or 'stick with the devil you know – they are all as bad.' In the vast majority of cases switching had been considered because it might result in lower costs, and one tenant claimed to have obtained a 'free' cooker from Scottish Hydro for becoming a dual fuel customer. Several people had been helped by the RSL to switch and two people had done online price comparisons. One individual had used this information to go back to British Gas threatening to leave – he was then offered a much more competitive online tariff.

Where respondents had not switched this seemed to be less about inertia, although that was mentioned as a reason, and more about the fact that 'all suppliers are the same" i.e. expensive. More positively, several were happy with their current supplier, often because it had good customer liaison, and were therefore not inclined to swap. A few felt they had been 'hassled' into changing – Eon and EDF were mentioned in this context, although other respondents claimed to have found both suppliers good at customer care.

Every respondent in the survey knew where their meters were and most read them regularly. In general they were in a relatively accessible location although one tenant who had back problems had to crawl inside a cupboard and another tenant with heart disease had to climb up on a chair. Several were just outside the door of a property and this could be something of a nuisance in cold weather. Only two people claimed to have heard about smart meters but when respondents were told about them there was almost unanimous approval of the idea, and respondents indicated that they would be happy to have one installed – as long as it did not cost them too much, either in terms of the unit charge, or the initial switching costs. All respondents would welcome the chance to be able to see exactly how much energy they were using. One person raised their mistrust of energy suppliers: 'I'd want to know what I was signing up for – you have to read the small print carefully.' 'How do I know the energy company would see the same figures as me?' This may also indicate a lack of trust of computerised functions.

7 The RSL as a trusted supplier

The qualitative research with RSL tenants showed that the main reason respondents would consider switching energy supplier was, not surprisingly, cost. Consequently, especially if they trusted the RSL – and the vast majority had nothing but praise for their RSL – they were happy with the idea that it might become their chosen energy supplier: *'They own my house, so why not let one organisation do everything?' 'CRE are an excellent landlord and I trust them, so yes, as long as it worked out cheaper.' 'GHA are good landlords... they do a lot of good for people.' 'Definitely interested. I love GHA – they have been absolutely fantastic to me, especially when my husband died.'* One respondent mentioned the 'good green credentials' of the RSL as a reason for switching.

However, some respondents were more sceptical: '*Would it mean if you had a problem [paying for energy] that it would affect other aspects of your tenancy?' 'Whose "piggy bank" will it come from? Will the "admin" costs end up on my bill?' 'I like the idea of renewable energy but costs might go up – bigger companies might work out cheaper.' 'My initial reaction is that GHA should stick to housing! Why get involved with anything else? On the other hand, maybe if bills were lower...'*

8 Financial regulations and Consumer Credit Act implications

The consumer credit licensing regime, as underpinned by the Consumer Credit Act 1974, is relevant for most businesses if they offer goods and services on credit or for hire. The ability to pay in arrears and/or in instalments (four or more in a 12 month period), also means a business needs a licence. Generally compliance is not onerous, either in terms of the time input or financially as regards the licence fees. The regulations set out requirements, which are aimed at ensuring that consumers are well informed of their rights and are suitably protected. The focus of the requirements is on information provision, clear advertising of offers and products, and the application of fair processes to settle any debt. Though the licensing regime must be adhered to, it should not pose a risk to the ESsCo business model.

Consumer Credit Licensing – overview

Most businesses that provide goods and services on credit or for hire, or that lend money or provide debt collection, debt counselling or debt adjusting services to consumers, need to have a credit licence under the Consumer Credit Act 1974.

Trading in credit activities without a credit licence is a criminal offence and as such it is vital that any business model applies for the appropriate licence. The process of obtaining a licence is itself straight forward, and the financial implications are not significant.

The credit regime is currently subject to a Government consultation which will result in a potential significant reform of the credit regime and associated impact on business, in terms of both compliance and financial costs. The consultations conclude in mid 2013, with the aim of the new regime taking affect in 2014.

Relevance to the business model

It is clear that an ESsCo would need to obtain a Consumer Credit Licence (CCL). Offering consumers the options of paying in arrears, in four or fewer installments a year means the company would need to acquire a CCL. The OFT advises that all firms who believe that they may be caught by the regime should seek legal advice to confirm their status and their subsequent obligations.

Impact of requiring a CCL

Before the company can trade it must apply for and obtain a CCL. The application process is detailed below, along with details of costs.

In addition to holding a licence, the regulations also set out rules on issues such as advertising, pre contract disclosure, credit agreements and post contractual information. The Act confers certain rights on consumers, in relation to such matters as withdrawal from a credit agreement, early settlement, and section 75 (joint and several liability). Each of these aspects are outlined below.

Key provisions

Some, although possibly not all of the CCA provisions, may apply to the ESsCo business model. A full legal opinion of its applicability should be undertaken at the appropriate time and the relevant legislation indicated. Below is a summary of the key provisions which might apply. consultation which will result in a potential significant reform of the credit regime and associated impact on business, in terms of both compliance and financial costs. The consultations conclude in mid 2013, with the aim of the new regime taking affect in 2014.

- Pre contract information
- Post contract information
- Early settlement
- Credit advertising
- Unenforcable credit agreements
- Information sheets
- Time orders

These provisions are covered in detail in the Regulatory Requirements workstream report.

Possible future changes

On 1 April 2014, the regulation of the consumer credit market will be transferred from the Office of Fair Trading (OFT) to the Financial Conduct Authority (FCA). The Government indicated that its aim in doing this was to increase protection for consumers.

In March 2013 the Government and the FSA published parallel consultation documents setting out proposals for this transfer.

It is not yet known what the final consumer credit regime will look like and what the regulatory requirements are likely to be. The underlying legislation which sets out the rights of consumers and the obligations of lenders is unlikely to change, however the mechanisms for obtaining a licence, remaining on the register and any supervisory requirements may be subject to change. A review of the new regulatory regime as it applies to utility companies and this particular business model should be undertaken once the changes have been announced.

Renewable generation

Berwickshire Housing Association

Berwickshire Housing Association

Chapter Summary

The aims of the workstream are to:

- Identify the potential of establishing a network of renewable generation schemes, with electricity output enabling the supply of affordable energy to communities.
- Explore the feasibility of RSL partners developing a co-operative which would invest in renewable energy.
- Investigate the funding issues that arise in the development of renewable generation schemes and in the purchase of electricity from existing schemes.
- Review the direct and indirect provision of Power Purchase Agreements (PPAs) as a means of creating a vertically integrated supply chain, where reliable renewable energy generation underpins the supply of affordable energy targeted at low income customers.

Community owned renewable generation provides a great opportunity to obtain a local gain from the installation of generating technologies. Tying this in with a local supply means that the energy generated can impact on fuel poverty. This workstream looks at the potential for community and RSL renewable generation, along with ESsCo generation.

Whilst growth in renewable generation in the UK has been less than in other parts of Europe where finance, policy and other incentives have been stronger, in the UK, Scotland has led the way in the development of community owned generation schemes. There is a good deal of activity but also opportunity for growth in order to meet the targets that have been set.

Many communities and interested bodies like RSLs have developed a range of community ownership models with different financing options, ranging from wholly community owned to private equity funded models. However, the impact on fuel poverty as a result of these ownership models has been negligible and raising funds remains a challenge.

Further challenges for community renewable schemes have been the financial and opportunity cost, and capacity to develop and finance such schemes. Despite this, it is clear that there is growing interest and appetite from RSLs, local landowners and local communities to develop schemes at scale that will impact on fuel poverty.

An ESsCo with a generation arm has a number of advantages, it provides a way for the ESsCo to meet its renewables obligations, provides the ability for scaling up, achieving an additional profit line and most importantly, providing price certainty for the duration of generation. This will provide a high level of independence and a means of building specific skills sets, services, and partnership models. These will support and deliver generation schemes and returns to communities and a greater impact on the reduction of fuel poverty.

1 Introduction

In this workstream, we consider different options for generating electricity from renewable sources including through an ESsCo, through a variety of community-led generation schemes and through other generators. In particular we consider the potential of:

- IAn ESsCo developing and funding renewable energy schemes,
- ICommunity-led schemes which may be independently run or facilitated by a separate entity, and which could be backed by a consortium of RSLs,
- IRSLs forming a co-operative to invest in electricity generation,
- IRPE acting as the generator, as part of its plans for a developing a number of generation sites which could offer energy to the supply company alongside other renewable generators that are interested in supplying a social business,

This workstream was unable to develop combined heat and power (CHP)[1] options. It is hoped that this could be included in a second phase of development.

We begin by providing background on the development of community renewables, which gives the context to the options under consideration.

2 Aims and methodology

The aims of the workstream are to:

- Identify the potential of establishing a network of renewable generation schemes, with electricity output enabling the supply of affordable energy to communities,
- Explore the feasibility of RSL partners developing a co-operative which would invest in renewable energy.
- Investigate the funding issues that arise in the development of renewable generation schemes and in the purchase of electricity from existing schemes.
- Review the direct and indirect provision of Power Purchase Agreements (PPAs) as a means of creating a vertically integrated supply chain, where reliable renewable energy generation underpins the supply of affordable energy targeted at low income customers.

In producing this report we have undertaken desk top research and drawn on the work and experience of RPE. The report draws on a paper produced specifically for this Warm Homes Fund project by the Urban Energy Research Unit at Herriot-Watt University.[2]

1 The Combined Heat and Power Association define CHP as integrating the production of usable heat and power (electricity), in one single, efficient process. CHP generates electricity whilst also capturing usable heat that is produced in the process. For further detail see http://www.chpa.co.uk/what-is-chp_15.html
2 A Review of Renewable Generation Schemes for Communities, Peacock A and Jenkins D; Urban Energy Research Unit, Herriot-Watt University

3 The development of community renewables

Community generated renewable energy connected to an ESsCo presents real opportunities for communities to benefit from local generation in terms of the energy produced and in providing an income stream. What has been achieved in the renewable generation sector has been remarkable and often against the odds, however, current installations are scratching the surface of the opportunity available.

Historically, renewable energy capacity in the UK has lagged behind growth in the sector in other major EU countries including Germany, Spain, France and Italy. For instance, the total installed capacity of wind generation in the UK has evolved from a negligible amount in 2000 (0.4GW) to 8.4GW in 2012 whilst at the same time 25.2GW and 20.4GW of wind capacity has been installed in Germany and Spain respectively[3]. A similar pattern emerges when installations of solar-PV are considered, with approximately 1GW installed in the UK between 2005 and 2012 compared to 15.5GW and 4.3GW in Germany and Spain respectively[4].

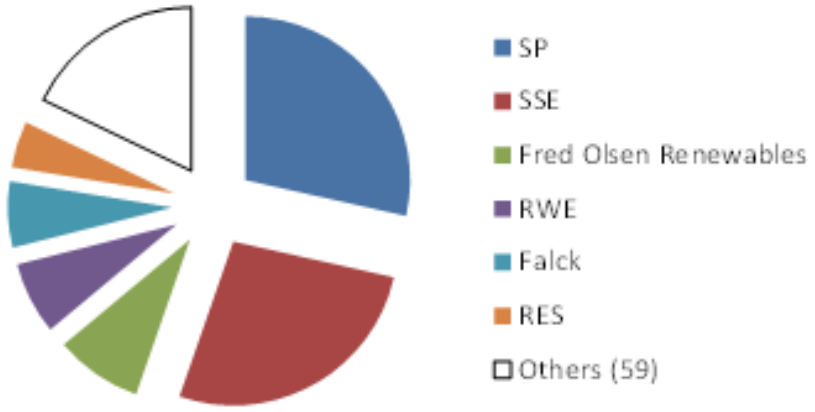
Academic studies show that there are a number of factors that have influenced these differing growth trajectories. With respect to wind power, four key variables have been identified as influencing the development of wind generation[5]:

- Planning systems which favour wind power are crucial, although national planning policies generally tend to support wind power development, planning institutions across European countries differ and result in differences in implementation.
- Systems of financial support are also key, but vary in effectiveness; robust and consistent support regimes in Denmark, Germany and Spain have encouraged investment and development.
- Landscape protection organisations vary in the influence that they hold;in the UK they are very influential, in Spain they have no such force.
- Local ownership, rather than remote corporate ownership, tends to coincide with higher rates of wind power development, though Spain is an exception. Local involvement attracts support for projects which may centre on energy activism. Such traditions are strongest in Denmark and Germany and weakest in UK.

Localism, energy activism and ownership have played a significant role in the expansion of the renewable sector. It has been argued that the absence of co-operative (i.e. local) ownership significantly exacerbates planning controversies[6]. The Sustainable Community Energy Network (SCENE) has suggested a number of reasons why community-led renewable energy projects should be encouraged[7]. These include rural communities facing fewer power outages, the boost to the local economy, the promotion of greater energy consciousness and the impetus provided for project completion.

3 http://www.ewea.org/statistics/ - accessed March 2013
4 http://www.eurobserv-er.org/ - accessed March 2013
5 Toke D, Breukersb S. and Wolsink M. Wind power deployment outcomes: How can we account for the differences?, Renewable and Sustainable Energy Reviews, 12 (2008) 1129–1147
6 Ibid.
7 Harnmeije A., Harnmeijer J., McEwen N., and Bhopal V., Report on Community Renewable Energy in Scotland, SCENE Connect Report, May 2012

Figure 1: Developer involved in operational Scottish, onshore wind capacity (by end of 2012)



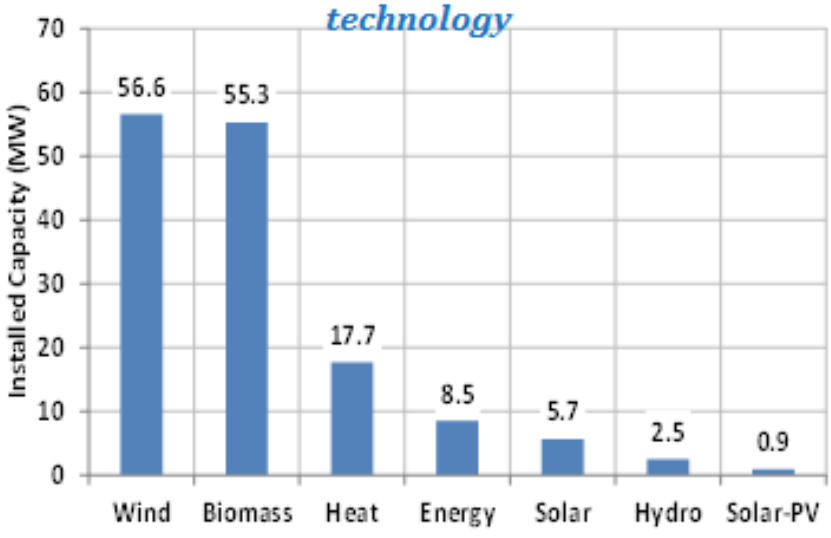
Looking at who owns deployed and operational renewable generation[8], onshore wind farms in Scotland make up 3.7GW (44%) of the 8.4GW of total wind capacity in the UK, and 64% of the total installed UK onshore capacity (5.7GW). Approximately 82% of installed capacity was developed by six companies, two of which are UK based, the other four have headquarters in Spain Norway, Germany and Sweden. More than 50% of capacity was developed by just two companies: Scottish Power and SSE.

Community led energy projects can be defined as:

Those projects where communities (of place and interest) exhibit a high degree of ownership and control of the energy project as well as benefiting from the outcomes either through energy saving or revenue generation[9].

For consistency, this is the definition we have adopted in this paper. The Energy Saving Trust (EST)[10], using the same definition, estimated that the total amount of wind power that is thought to be in community ownership in Scotland at the end of 2011 was 56.6MW – 1.5% of the total installed capacity (Figure 2).

Figure 2: Community owned renewable energy capacity in Scotland in 2011 disaggregated by technology

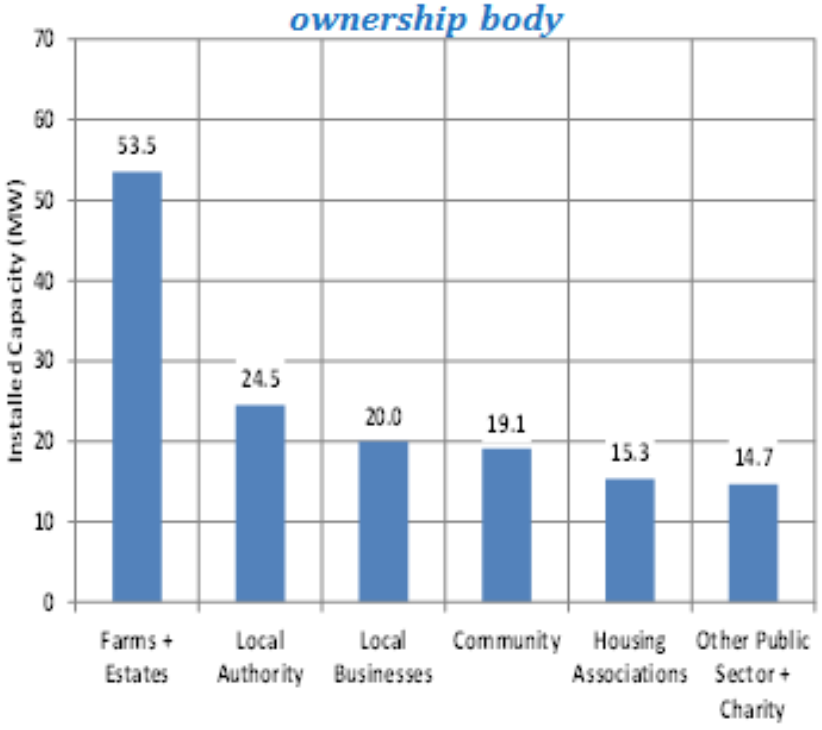


The total community or locally owned renewable energy capacity in Scotland in June 2011 stood at 147MW. This was spread over about 3460 installations, the majority of them (75% by installation, not capacity) were heat pumps and solar thermal, most of which were installed in individual dwellings owned by RSLs.

In terms of operating capacity rather than numbers of installations, ownership was predominantly by farms and estates, with the remainder split fairly evenly between community organisations, public sector organizations, charities local businesses, local authorities and RSLs (Figure 3).

A further 655MW of capacity, from about 1,600 installations, was in planning in June 2011, and most were wind projects (598MW). Of the 655MW, 25MW was under construction, 96MW had been granted planning permission, 334MW were going through the planning process and 200MW was at the pre-planning stage.

Figure 3: Community owned renewable energy capacity in Scotland in 2011 disaggregated by ownership body



Approximately 30% of the additional capacity was provided by a single project, the Shetland Charitable Trust portion of the Viking wind farm (total capacity of 457MW) in central mainland, Shetland.

The UK wide picture is less clear and there is a lack of information about the overall scale of the sector. Co-operative UK[11] has estimated that the number of renewable energy co-operatives is increasing, with over 30 that have registered since 2008, and the number of energy trading generation co-operatives has reached 19. Together, these organisations are responsible for installed capacity of 19.6MW in a wholly owned generation capacity and a further 1.22GW in part ownership through investment in larger, commercial schemes.

11 Willis R and Willis J, Co-operative renewable energy in the UK: A guide to this growing sector, Co-operative UK, 2012

Cooperative UK also reported that over 7,000 individuals have invested £16 million in community owned wind turbines since 1997.Analysis of renewable energy deployment resulting from the UK Feed in Tariff (FIT) scheme, introduced in April 2010, indicates that by the end of 2011, 661MW of installed capacity from 143,000 individual installations was registered, and approximately 90% of this was solar-PV[12]. It is estimated that 10% of total FIT payments are made to social landlords.[13] Given that approximately 16% of the UK housing stock is managed by social landlords, they appear to be proportionately under-represented in their take up of the FIT scheme.

The Community Sustainable Energy Programme (CSEP) is an open grants programme run by BRE, an independent consultancy and award partner to the BIG Lottery Fund[14]. Up until February 2012, £8.5M had been awarded through the programme to community-based organisations for the installation of micro-generation technologies and energy efficiency measures. The total number of energy generating technology installations that have been installed under the scheme is approximately 620. Many projects involve the installation of more than one technology (40% of the installations were solar-PV) (Table 1). For electricity generating technologies, these grant funded schemes form a subset of the numbers recorded under the FIT scheme referred to above.

Technology	Number of installations	% of total
Hydro	2	0.3
ASHP	75	12.1
Solar-PV	259	41.9
Solar Thermal	89	14.4
Biomass	67	10.8
GSHP	55	8.9
Wind	71	11.5

Table 1: Micro-generation technologies installed under the CSEP scheme (phases 1 to 11)

The Scottish Government´s recent, Routemap for Renewable Energy in Scotland[15] recognised the particular challenges for market growth in the production community energy. The report reiterated the Government's target of the generation of 500MW of community owned renewable energy by 2020. The Government is likely to meet the target, particularly if the Viking Wind Farm proposal goes ahead. By 2020 the forecasted total installed capacity of renewable energy will be between 11GW and 18GW. However, this represents a small proportion of total generation at 2.8-4.5% of all renewable energy and presents a great opportunity to expand into this ambition.

Installed capacity figures also indicate that an increasing number of renewables projects have been approved, are in construction or are already operational (Figure 4). If the projection for future installed capacity is based on an extrapolation of the annual deployment levels between 2009 and 2011, then the total installed capacity in 2020 would be 11GW. The renewable capacity for which economic arrangements have already been agreed is approximately 9.2GW, or 86% of the target capacity for 2020.

12 Clark T. and Hay S., Renewable Energy – Getting the benefits right for social housing, JRT, October 2012
13 http://www.insidehousing.co.uk/eco/social-housing-pv-unviable-unless-fit-rates-double/6519938.article - accessed March 2013
14 http://www.communitysustainable.org.uk/ - accessed March 2013
15 Renewable Routemap for Scotland, Scottish Government, Oct 2012

4 The potential for a network of renewable generation schemes

Community generation structures

There are a range of different models which could be used to develop renewable generation schemes and supply affordable energy to local communities. In this section we explore the advantages and disadvantages of key models for community-led renewable energy projects. The Joseph Rowntree Foundation(JRF) [16] describes four models that have been used to initiate, construct and manage community led renewable energy projects, and these are outlined below.

For Profit Investment Co-operatives

For profit investment cooperatives have been generally been developed through the formation of Industrial and Provident Society's (IPS). In the UK, Energy4All[17] has led the development of a type of IPS that allows private individuals to join through share subscription. The money raised is then co-invested together with a commercial developer in a renewable energy scheme.

The Energy4All model was first used by the Baywind Energy Co-operative Ltd, which was created to invest in the Harlock Hill wind farm in Cumbria in 1997. Since this time, the model has largely been used to invest in wind farm developments. These schemes are not dependent on public grants, although they benefit from tax incentives, for instance Enterprise Investment Scheme tax relief. Projects to date have sought to invest alongside commercial developers in projects, although a project is currently being developed where the co-operative would wholly own the asset. The IPS vehicle has also been used to fund the development of other technologies, for instance solar parks (Westmill Solar Co-operative[18]), rooftop PV (Gen Community[19]) and hydro (Torrs Hydro New Mills[20]).

Energy4All promotes and manages the development of an IPS by targeting communities that are local to the proposed development. If sufficient investment cannot be raised locally, then the net is cast more widely. Co-investment in wind farm development involves no physical transfer of assets with revenue created for the IPS through a royalty model applied to the total revenue generated by the project. Royalty payments are thought to be approximately 4% (based on Boyndie Wind Farm

16 Gubbins N,: Community Assets: The role of community energy schemes in supporting community resilience, JRF briefing paper, November 2010
17 Energy for All is a limited company established by Baywind Energy Co-op to develop green energy schemes that are owned and operated by the local community, for further information see http://www.energy4all.co.uk/ -
18 http://www.westmillsolar.coop/ - accessed March 2013
19 https://www.gen-community.co.uk/ - accessed March 2013
20 http://www.torrshydro.org/TorrsHydro/About-Us.html - accessed March 2013

Co-operative data). To date, Energy4all has been involved in developing eight co-operatives.

Energy4all encourages the local co-operative to create a fund that can be distributed to relevant local projects, similar in nature to that created through community benefit arrangements with commercial wind developers. The development of this fund is not mandatory, all profits from the IPS can be distributed to the shareholders. Where a fund is created, profits from the investment are split between dividend payments to investors and the fund. For instance, the Westmill Wind Farm Co-operative set up the Westmill Sustainable Trust[21] which receives 0.5% of the revenue from the wind farm each year. It uses this to promote the development of sustainable energy projects within a 25 mile radius of the wind farm.

The method of attracting investors focuses on localism. However, there is no guarantee that the majority of investment capital will be raised locally. Baywind Energy Co-operative[22] for example, upon which the model was established, has 1,300 members in total, and only 35% live in the locality of the wind farm. Energy4All literature does not indicate the nature of the pool of investors it contacts after local interest has been exhausted, but this may be drawn from a community of interest.

JRF suggests that an interesting area for further development is the scope for linking investment co-ops, such as those developed by Energy4All, with non-profit distributing community projects. This would help keep revenue in the local economy. An attraction for RSLs might be if they could participate in an investment model that they developed to support local renewable development, and profits from this could then be invested in its core strategy, e.g. the development of homes, property maintenance and improvements and the reduction of fuel poverty among residents.

Joint Ventures between Community Groups and Private Companies

The joint venture model typically involves a scheme whereby a community group and a private partner set up a new company with joint shareholdings, which will own and operate the energy generation development. Alternative models have also been developed where the joint venture arrangement is only active during the development of the project. Once the scheme is operational, two companies are formed one for the private company, one for the community. The benefits of a community partnership for a private company are likely to be greatest in the planning phases of the project with the partnership satisfying the company's social responsibility targets through the delivery of the social capital.

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16 Gubbins N,: Community Assets: The role of community energy schemes in supporting community resilience, JRF briefing paper, November 2010
17 Energy for All is a limited company established by Baywind Energy Co-op to develop green energy schemes that are owned and operated by the local community, for further information see http://www.energy4all.co.uk/ -
18 http://www.westmillsolar.coop/ - accessed March 2013
19 https://www.gen-community.co.uk/ - accessed March 2013 20 http://www.torrshydro.org/TorrsHydro/About-Us.html - accessed March 2013
21 http://www.westmill.coop/westmill_yourcoop.asp?ID=YOR4&catID=2 – accessed March 2013
22 http://www.baywind.co.uk/baywind_home.asp - accessed March 2013

This is an area where RSLs are active in trying to create revenue generation to supplement falling grant revenues from national and devolved administrations. Grampian Housing Association (GHA)[23], for example, estimates that Scottish Government housing grants have fallen by 80% since 2008 and that if they were to rely solely on government funding that they would only be able to build 20 new affordable homes per annum. GHA have set up a subsidiary company called Grampian Community Energy that seeks joint ventures with community groups, land owners and commercial renewables developers to help bridge this gap. They are seeking to concentrate chiefly on wind and hydro projects with installed capacity greater than 0.3MW.

Another example is Neilston Community Wind Farm[24], which was developed via a joint venture between Carbon Free Developments (CFD) and Neilston Development Trust (NDT). CFD, in return for community support, identified a sensible and appropriate site and initiated the management development phase of the project, which was a sheltered scheme, at its own financial risk.

Community Energy Scotland Trading Ltd[25] is another example. It is a social enterprise which is a wholly owned subsidiary of Community Energy Scotland. It seeks involvement in joint ventures with community groups and landowners. A key benefit of their involvement is in reducing the capital risk for these projects through their expertise in navigating the planning process. As a consequence, commercial developers, who would ordinarily require larger returns to offset capital outlay during planning, are able to participate in projects that generate less than 10MW. All profits that are made through the participation of Community Energy Scotland Trading Ltd in the joint venture are returned to the parent company.

Non-profit Distributing Companies

Non-profit distributing companies involve an existing or newly established development trust in the development of a project from conception to operation. A wholly owned subsidiary is formed to manage the operational side of a project with profits returned as a charitable donation to the holding company. Project finance is typically sourced from grant funding. The introduction of the Feed in Tariff (FIT) in 2010, which encourages consumers to generate and sell their own energy (further detail is provided under the heading on FIT below), and by a shift in policy in favour of revenue generating business models rather than grant funded support has helped increase take=up[26]. This switch in focus towards community participation in the economic benefits of a scheme was indicated by the UK Coalition Government in 2010[27]:
"We will encourage community-owned renewable energy schemes where local people benefit from the power produced. We will also allow communities that host renewable energy projects to keep the additional business rates they generate."

Three schemes are currently in operation in Scotland that follow this business model,

23 http://www.grampianhousing.co.uk/index.php?id=363&lang=en – accessed March 2013
24 http://www.neilstonwindfarm.org/ - accessed March 2013
25 http://www.communityenergyscotland.org.uk/community_energy_scotland_trading - March 2013
26 Seyfang G., Park J.J and Smith A, Community Energy in the UK, 3S Working Paper 2012-11, UAE
27 The Coalition: our programme for government, HM Government, 2010

and they are wind farm developments on the Scottish Islands of Gigha, Tiree and Westray.

The benefit of this type of arrangement is the strong element of community equity that can be embedded in a project. The distribution of revenue generated from the development is wholly owned and allocated by the community who typically hold equity in the holding company for a nominal financial outlay.

Community Benefit Arrangements with Commercial Developers

Commercial wind farm developers may, currently at their own discretion, ring fence a proportion of the revenue generated by a development and give this to a community led organisation to spend on local projects that the commercial developer deems appropriate.

In general, developers offer anything between £1,000 and £5,000 per MW installed per annum. Involvement of the commercial developer in the allocation of funds by community led organisations differs markedly. This method of community involvement has successfully generated income at a local level for a range of developments.

Argyll & Bute Council attempted to place the arrangements described above on a more contractual basis by creating a strategic concordant with wind farm developers seeking to commercialise sites in their area. Community benefit agreements effectively become part of the planning process. Developers are required to pay annually £2,000 per MW installed plus up to an additional £1,000 per MW dependent on yearly output. The Council have set up a Community Wind Farm Trust Fund to distribute the funds received from various developments, with an overarching goal to see 60% of funds allocated to projects benefiting the locality immediate next to the development and 40% allocated to projects in elsewhere in Argyll and Bute.

The Forestry Commission in Scotland has recently agreed to pay £5,000 per MW installed. At this rate, the benefits to the community may become fiscally competitive compared to the returns offered by other models. Detailed financial modelling of potential benefits from differing business models was beyond the scope of this review. However, based on the figures provided by the Huntly Development Trust for the proposed acquisition of a ‘virtual’ wind turbine at Cairnborrow Wind Farm (currently subject to planning appeal) the equivalent payment per MW of an 11% revenue royalty was £10.7k. Simply applying proportions would suggest that the £5k per MW payment offered by the Forestry Commission would be equivalent to a 5.1% royalty. This is greater than the royalty payment received by the Boyndie Wind Farm co-operative. No information could be found that detailed restrictive covenants associated with dispersal of the fund created by Forestry Commission payments. The level of autonomy provided to the community trust would strongly influence the perceived level of ownership.

5 RSLs forming a co-operative to invest in electricity generation

RSL Development Group

There are initiatives being undertaken by RSLs on individual generation projects and in particular the seven funded RSLs for this Warm Homes Fund collaborative project. Of the seven collaborative RSLs, consideration is being given to establishing an investment and implementation strategy. Green Hairst is the working name of a proposed collaboration of Scottish RSLs[28] which, through strength in numbers and sharing of expertise and resources, will be able to rapidly scale up RSL investment in mid to large scale renewables, avoiding territoriality and working in partnership with communities.

Green Hairst will, where feasible, be more generous to the communities affected than private developers and where appropriate, communities will be encouraged to take an equity share in the projects developed.

The income generated by Green Hairst will assist RSLs[29] in furthering their social and charitable aims including the building of homes for social rent, whilst the income generated for communities will contribute towards self-sufficiency and sustainability, building community assets and supporting local service provision.

Given the nature of RSL activity and expenditure every pound of profit generated by Green Hairst will lever significantly more in purely economic terms, the funds expended by the RSLs and the communities concerned also creating an even greater social return on investment.

RPE generation

RPE is developing a pipeline of renewable generation opportunities. The first of these is a 1.5MW windfarm in East Lothian which has received planning consent and is awaiting grid approval. It is expected that this development will move to financial close in September 2013 with completion by the end of Summer 2014. Future developments include wind farms in Scotland and Northumberland with planning applications submitted on a further two sites.

28 Throughout this paper RSL is used as a generic term. It is anticipated that participation in Green Hairst and in Green Hairst joint ventures by RSLs will be through RSL commercial, non-charitable, and wholly owned subsidiary companies. Whilst the distribution of profits by the subsidiary companies will be a matter for the subsisiaries and their RSL parents the general presumption is that in the interests of tax efficiency funds will be gift aided from the commercial subsidiaries to the charitable RSL parent companies.
29 See foot note 1 above.

6 Funding issues in the development of renewable generation schemes

Energy suppliers have an obligation to source a proportion of the total electricity that they supply from eligible renewables generation and they pay a penalty if they fail to meet this requirement. Currently, the requirement is for 20% of electricity to be sourced from renewables. If a supplier is generating its own renewable electricity, this will count towards the 20% requirement and similarly, if it were to buy from community and other generators, this will also count towards the requirement. We describe below how the system works and what it is designed to do. The relevance is that a vertically integerated supply chain will allow the ESsCo to meet its requirements and to trade any additional Renewable Obligations Certificates (explained below) as a profit maximizing strategy.

Support for renewables

Renewable Obligations Certificate (ROCs) and supplier obligations

As outlined in the earlier chapter, every electricity supplier is required to source a proportion of their total electricity that they supplied from eligible renewables generation (their obligation) or to pay a 'buy out price' for each MWh of their obligation not sourced from renewables. Ofgem issues Renewables Obligation Certificates (ROCs) to renewables generators to reward eligible renewables generation. Suppliers must meet their obligations by buying these ROCs and presenting them to Ofgem, or by paying the buy-out price. Initially ROCs were generally awarded at the rate of 1 ROC for 1 MWh of eligible renewable energy generation, and the obligations were specified in MWh. However, 'banding' is now widely used to provide a variable rate of ROCs per MWh according to the technology, and this varies over time to drive efficiency gains and reflect the different stages of development of different technologies. The suppliers' obligations are now expressed in ROCs, and for 2013-14 the obligation is 20.6 ROCs per 100 MWh.

Setting the obligation

The obligation on suppliers is set annually six months in advance of the obligation period i.e. before 1 October. The obligation is based on the greater of two quantities:

1. the fixed amounts set in the 2009 Order for each year (eg. 13.4 ROC per 100 MWh in 2013-14), or
2. the estimated likely renewable generation plus a 10 percent 'headroom' estimate.

The latter quantity equated to 20.6 ROCs per 100 MWh in 2013-14, and this became the obligation for 2013-14[30]. The idea of this is to ensure some scarcity in the ROC market so that ROC prices do not fall to zero and pressure is maintained to build

greater renewables capacity.

Buy out and late payments

Where a supplier cannot or chooses not to present ROCs to meet their obligation, they must pay a buy-out price for each ROC not presented – this will be £42.02/ROC in 2013-14. This creates a buy-out fund, which is then used to pay the administration costs of the scheme, with the remainder redistributed to suppliers in proportion to the share of ROCs they presented. The effect is to cap the cost of ROCs – a kind of economic safety valve. Suppliers can meet their obligations by holding ROCs, by buy-out or by a combination. Suppliers are charged if they make late payments and these charges are added to the buy-out fund. The combined value of the recycled buy-out and late payments fund in 2011-12 was £3.58/ROC.

Operational issues

Each obligation period runs from 1 April to 31 March. Ofgem provides the administrative platform for the Renewables Obligation (RO) through its E-serve business. Each supplier must have an account on the Renewables and CHP Register[31] and submit data and payments to a timetable set out by Ofgem32. The register is used to keep track of ROCs issued to generators and redeemed by suppliers. Suppliers must provide data to Ofgem on their annual supply for the preceding obligation period by 1 June, and meet their obligation by presenting ROCs or making buy-out payments and submitting a compliance report by 1 September.

Different UK systems

There are three RO systems with different systems operating in England and Wales, Scotland, and in Northern Ireland. The obligation on suppliers is common across England and Wales and Scotland, though there are differences in how many Scottish ROCs (SROCs) are awarded per MWh of renewable generation. From the suppliers' perspective the SROC and ROC are equivalent. Suppliers in Northern Ireland have a separate (lower) obligation, and can meet their obligations from ROCs sourced elsewhere in the UK.

It is possible to be a supplier, a generator, or both as a participant in the RO. The same Renewables Obligation Orders and administrative arrangements apply. Ofgem produces guidance to generators[33]. Key concerns for a generator include: planning, construction, licensing and grid connection of the generating station – these issues fall outside the regulatory framework of the RO.

The ROCs received per MWh generated and banding arrangements

- Accreditation – the process by which Ofgem confirms that the generating station is eligible to receive ROCs and conditions attached to participating in the RO
- Metering and data provision with the Renewables and CHP Register
- Trading of ROCs with suppliers and other off-takers – a commercial transaction
- Grandfathering – the policy intent to maintain support at the levels provided at the point of accreditation – ie. existing generation is not affected by future changes in the banding arrangements.

30 DECC, Calculating the Level of the Renewables Obligation for 2013/14 [link] 31 Ofgem, Renewables and CHP Register [link]. Register User Guide [link]
32 Ofgem,(Draft) Renewables Obligation: Guidance for licensed electricity suppliers [link]. Appendix 2.
33 Ofgem,(Draft) Renewables Obligation: Guidance for generators [link].

- Own use and export to a third party – renewables generated and used on site or exported to third party via a private wire can still receive ROCs.

UK Feed-in-Tariffs[34]

An alternative funding mechanism for renewable generation is the FIT. Introduced in April 2010, FITs applied to homes, businesses and organisations with installed renewable electricity technology. The FIT consists of two tariffs:

- Generation Tariff – a set rate for each unit generated
- Export Tariff – for that proportion not used by the technology owner and that is therefore presumed to be spilt onto the grid for use elsewhere.

FIT's are paid for through a levy applied to all sales of electricity and the inequity of this has been widely acknowledged. In effect all consumers of UK Electricity subsidise those members of the population who have sufficient capital to afford to purchase renewable technologies.

FITs apply to: Solar-PV, Wind, Biogas and micro-CHP technology. Installed capacity must be below 50kW except for micro-CHP where the upper limit is 2kW. The scheme has been subject to three revisions since its inception to attempt to manage demand that was almost threefold above Department of Energy and Climate Change (DECC) forecasts (Table 2). DECC assumed that Solar-PV capacity would reach 137MW by April 2012, in pratice, by the end 2011, 661MW of total installed capacity was registered under the FIT (90% of which was solar-PV).

Modeling studies have reported that the revenue generation from FIT at August 2011 rates, and proposed tariff structure for the Renewable Heat Initiative (RHI)[35], are sufficient to make a significant and lasting effect on fuel poverty[36].

FITs will provide a vertically integrated supply company with a guaranteed income stream for the a significant period of time (depending on the technology)

Funding issues

For new projects developed in Scotland, the Scottish Government's 'Community and Renewable Energy Scheme' (CARES) loan funding may be secured by an SPV where the SPV can demonstrate a significant level of community ownership / benefit. This can be through the direct involvement of a local RSL or through partnership with a constituted community organisation. For projects that can demonstrate a reasonable chance of gaining planning consent, such funding can provide up to 95% of pre-planning development costs, repayable should the project secure planning consent, grid connection and achieve financial close. Interest accrues on CARES loans at 10%,

34 Clark T. and Hay S., Renewable energy – getting the benefits right for social housing, JRT, October 2012
35 The Renewable Heat Incentive (RHI) is a new Government environmental programme that provides financial incentives to increase the uptake of renewable heat. Broadly speaking it provides a subsidy, payable for 20 years, to eligible, non-domestic renewable heat generators and producers of biomethane based in Great Britain, for further details see: http://www.ofgem.gov.uk/e-serve/RHI/Pages/RHI.aspx
36 Saunders, Gross and Wade, Can premium tariffs for micro-generation and small scale renewable heat help the fuel poor and if so how?, Energy Policy, Volume 42, 2012, pp 78–88

the loan being repayable in full once the project secures the necessary capital funding to proceed. Should either planning consent or grid connection not be achieved or the project fail to secure the necessary capital funding (i.e. is not commercially viable) the loan may be written off. In effect, the Scottish Government takes up to 95% of the risk. CARES loans may be up to £150k and to a maximum of 95% of pre-planning development costs. It should be noted that the project must commit to £10k per MW per year for community benefit for the lifetime of the project.

For community groups, the Scottish Government's Renewable Energy Investment Fund (REIF) administered by the Scottish Investment Bank (a part of Scottish Enterprise) will also provide funding for costs arising between the securing of planning consent and financial close, for projects meeting similar criteria to the CARES loan fund. This enables projects to progress from planning consent to financial close, whereby the funding package to take the project to completion is secured. This funding, however, is limited to projects that will deliver generation by 2017, with all funds being drawn by the end of 2015.

In terms of capital funding, renewable energy projects on good sites, using proven technology, are generally bankable with the principle lender providing bank debt typically to 80% of capital costs for directly developed projects i.e. where the project has been developed from the start by the company concerned. Such projects will typically require the remaining 20% to be provided from another source. For projects developed by another party but acquired by the borrower on commercial terms, the loan to value ratio may be significantly lower than the loan to cost ratio for in-house projects. In such cases the non-bank funded requirement of the borrower will be correspondingly greater. (Courtesy of Green Hairst)

Given potential to cover off development funding and the established market for bank finance for RSL/community owned projects, consideration needs to be given to equity and other funding required.

- **Cooperative share issue model** This is a sale of shares to (effectively) the customer base. Shareholders could get a profit share or reduced tariff rate. This has the advantage of including the target customer base and giving them a sense of ownership however, it will require effort and resources to set up and maintain.
- **Social investors** The social investment market is a growing one in the UK and there are a number of funds targeting environmental and social impact such as Bridges, Global Venture, Rabobank and Triodos all of whom have portfolios that include renewable generation.
- **Crowd source funding** There is also a growing crowdfunding movement raising investment from individuals and communities for specific projects for example motion pictures, cafes, parks. An example of this is a new company funded by BIG Lottery called Spacehive.
- **Impact investment** There are a growing number of investment targeted at making a social impact or delivering change using investment approaches to supporting development. A number of hedge funds have set up impact investment arms and some high net worth individuals have set up similar funds too. There are also statutory models aimed at generating social enterprises as a means for financing communities in an environment of shrinking Governmental funds and in line with the Big Society principles. For example Big Society Capital and Social Finance.

- **Venture Capital/Hedge funds** A number of venture capital and hedge funds have an interest in funding renewable generation as part of their portfolio of investments and to enhance their green and ethical credentials but do so mainly because (in the current financial environment) they are deemed to have the potential to deliver a good return.

7 Review of Power Purchase Agreements (PPAs)

Methodology

In Scotland there are currently over 24MW of community owned projects across 21 sites that use a Power Purchase Agreement (PPA) to sell their generated output. Six of these projects are registered for Renewables Obligation Certificates (ROC's) while the remainder receive payments under the Feed in Tariff (FiT).

Community Energy Scotland were commissioned to review PPAs and have obtained permission to analyse a sample of PPA agreements and offers, relating to nine projects (nine FiT projects, one RO project), on an anonymous basis. Further data on RO PPA's has been obtained from a third party specialising in the PPA market to provide a broader overview of the options currently available to the community energy sector. The terms of six suppliers in total have been examined. The following report summarises the findings from the research and analysis undertaken.

Definition of PPA

A PPA is a form of offtake contract between a generator and counterparty, concerning the transfer of power from the former to the latter on defined terms. As such they currently provide the primary 'route to market' for most projects over 30kW. For projects connected to the national grid, these normally provide for the purchase of 100% of the metered output by a licensed electricity supplier. The power is then either sold by the supplier into the wholesale market or directly to its own customers.

PPA's also ensure that the generator is compliant with the relevant regulations for injecting power into the national grid, and protect the generator from the financial and regulatory risk of an energy imbalance caused by a difference in their predicted and actual output. A range of non-energy based benefits and costs, described below, are also included in the terms of the PPA (e.g. environmental certificates).

These long-term agreements give certainty over the value of generated power, and combined with energy yield predictions, operational costs, and finance costs, are the basis of projected revenue streams. Depending on the technology and incentive regime (FiT/RO), PPA's are required by finance providers for a minimum period, which tends to be longer for projects under the Renewables Obligation (RO) because the value of ROC's varies more over time, compared to FiT's which are fixed at the time of accreditation and include a floor price for electricity exported to the national grid.

Because the PPA provider is assuming the 'basis risk' of differences in actual and contracted electricity prices, as well as the operating costs of delivering the services required to fulfil the PPA terms, the power values and any associated benefits passed through to the generator are always discounted. Arguably, the fact that there are only a small number of licensed suppliers willing or able to offer PPA's to small independent generators means that the level of discounting is also driven by the relative lack of competition.

Typical PPA elements

In general, a PPA will normally provide for the following:

- Transfer of the power to the supplier, who is obliged to purchase the station's output for a specified period
- Arrangements for forecasting and notifying generation volumes and managing outages
- The scale and timing of payments for wholesale electricity and other elements of value associated with the power, such as low-carbon incentive certificates and 'embedded benefits' (see below)
- A floor price or some form of power price indexation (or both).
- A description of the obligations and entitlements on both the buyer (PPA provider) and the seller (generator). For example the seller may not reduce its registered generating capacity without the buyer's consent.

Specific elements:

- **Renewables Obligation Certificate (ROC)**— The RO obliges suppliers to source increasing amounts of electricity from eligible sources evidenced through Renewables Obligation Certificates (ROCs). Eligible renewable generators receive Renewable Obligation Certificates (ROCs) for volumes of electricity generated. These certificates can then be sold to suppliers who require them in order to demonstrate compliance with the RO. Suppliers who have a shortfall of ROC's are obliged to pay into the 'buy out fund'.

  The value of a ROC is derived from two components: The 'buy-out' (the value of the certificate relative to the fixed price set by the UK Government each year) and the 'recycle' (the proportion of the buy-out fund that ROC holders are entitled to after the number of certificates for the year has been settled). Because these values are determined at different times, the PPA will describe when payments relating to both elements will be made by the PPA provider. This can have a significant impact on cashflow, particularly for small schemes.

- **Feed-in Tariffs (FiT)**— The FiT support mechanism was introduced by the UK Government in April 2010 as a targeted form of financial support for renewables projects of less than 5MW of capacity. Fixed payments are made for each unit of generation, varying with the scale and technology of the eligible installation. The payments are made by a licensed supplier that is a party to the FiT mechanism, but this need not be the same supplier who provides the power offtake PPA (as the FiT is based on metered generation, not power export to the national grid).

Grid connected FiT generators have the choice of accepting the 'guaranteed export price' set by the UK Government for FiT projects, or to sell exported power (including LEC's and embedded benefits) on the open market. If a generator has chosen the latter, then this will be described in the terms of the PPA.

Generators that opt in to receive guaranteed export payments are unable to opt out and sell on the open market, and vice-versa, until at least one year after the accreditation of the project. After this date generators are permitted to change their selection of opt in or out, but no more than once every year.

This gives FiT projects more flexibility than ROC projects, as they can try different strategies for their offtake on an annual basis, whereas ROC projects are typically required by funders to enter into PPA's for at least seven years as there is no floor price for the generated power.

- **Levy Exemption Certificates** (LECs) evidence electricity produced from a source that would not attract the Climate Change Levy (CCL) for supply to business customers. Currently the value is around £5/MWh.

- **Renewable Energy Guarantee of Origins (REGOs)** evidence electricity produced from a source defined as renewable under a 2003 EU directive. Currently the value is effectively zero, but they are still included in PPA terms.

- **Embedded benefits**- Community owned generation is typically connected at the distribution network level, rather than the transmission level. 'Embedded benefits' are financial benefits available to the supplier from buying power from distributed generation for onward supply at a local level. This facility stems from avoidance of use of the transmission system and certain administrative costs that are allocated under the central traded arrangements to suppliers. These costs include Transmission Network Use of System Charges (TNUoS) including 'Triad' charges, Balancing Services Use of System Charges (BSUoS), transmission losses and Generation Distribution Use of System Charges (GDUoS), which are described below.

- **Distribution Use of System (DUoS)** charges — that are levied by host distribution network operators (DNO's) to electricity supply companies to cover the cost of distributing electricity to their customers. GDUoS charges vary by region, whether the site is an intermittent generator, and whether it is half-hourly (HH) or non half-hourly (NHH) metered. The highest (positive) GDUoS charges are generally achieved by a non-intermittent site generating in times of peak demand (red time-band). Typically around £5/MWh.

Typical duration of PPA

PPA's can be offered either under standard terms that suppliers may advertise publicly but are not open to negotiation, or through bespoke contracts that are designed to take into account the needs and strengths of an individual project.

Of the PPA's for FiT projects examined by CES, the contract term ranged from 3-10 years. Prices were either fixed or indexed to a month ahead market index. After 3 years most included a break clause with 12 months written notification required to

leave the contract without penalty.

However CES is aware of shorter term PPA's for FiT projects of as little as six months being offered by some suppliers. While these would not be suitable for a project seeking non-recourse finance, for operational projects without finance restrictions a shorter term PPA provides more flexibility and the opportunity to 'shop around' more often and from a larger number of suppliers- as such realised power values are likely to be higher as they will track market movements more closely.

The contracts for ROC projects tend to be longer; we have seen examples ranging from 7 to 15 years. These products have been developed to reflect the needs of finance providers, but the nature of the long term commitment means that only some suppliers are willing to assume the liabilities required to offer a fixed price over the necessary timeframe.

Current PPA providers

All of the 'big six' suppliers (NPower, SSE, Scottish Power, EON, EDF, British Gas) offer PPA's, as well as some specialist suppliers such Opus Energy, Smartest Energy and Spark Energy.

As far as Community Energy Scotland are aware, all of the PPA's held by community generators are either with NPower or Smartest Energy.

Indicative range of terms and power values

In the tables below we have summarised how the elements of a PPA are currently valued in the sample of PPA's examined. Where values have not been stated in the PPA, but included as a percentage, we have provided reference values to calculate the (approximate) final value per MWh.

FiT projects:

All the FiT projects were based on the same technology (wind) and tariff band. The maximum range in final values for FiT PPA's was £7.55/MWh, equivalent to nearly £18,000/year on a 0.9MW site (30% average capacity factor). The average value was £151.59/MWh.

Site	Technology	Size (MW)	Generation tariff (fixed, 500kW-1500kW tariff band) (£/MWh)	Export (£/MWh)	LEC	Embedded benefits	GDUoS	Contract Fee (monthly)	Total value (£/MWh)
1	Wind	0.9	£99.0	£47.00	90%	95%	100%	£50	£155.50
2	Wind	0.9	£99.0	£43.90	90%	90%	0%	£49.50	£147.95
3	Wind (five sites)	0.9	£99.0	£43.00	90%	90%	100%	£50	£151.34
4	Wind	0.9	£99.0	£50.90	80%	0%	0%	£0	£154.10
5	Wind	0.8	£99.0	£47.11	70%	90%	0%	£49.50	£150.10
Reference (£/MWh)					£5.24	£3.19	£4.30	-£2.54	

ROC projects:

All of the ROC projects were based on the same technology (wind), but included different sizes of installation, and 'spill only' contracts as well as 100% offtake. Spill only contracts are often used for generators supplying an on-site load but may need to export to grid when generation exceeds onsite demand. As such the value of the power is discounted more than a 100% offtake contract as it is less predictable. Apart from site 1, the data on the ROC projects was provided by an independent third party energy consultant. The maximum range in final values for ROC PPA's was £15.60/MWh, equivalent to £205,000/year on a 5MW site (30% average capacity factor). The average value was £92.82/MWh.

Site	Technology	Size (MW)	ROC value (£/MWh)	Export (£/MWh)	LEC	Embedded benefits and GDUoS	Contract Fee (monthly)	Total value (£/MWh)
1	Wind	9	£40.25	£48.27	70%	95%	£49.50	£98.80
2	Wind	5	£44.6	£45.0	80%	65%	£50	£98.10
3	Wind	5	£43.2	£45.80	90%	70%	£100	£97.80
4	Wind (spill)	3.2	£48	£34.0	80%	0%	£0	£86.20
5	Wind (spill)	3.2	£43.2	£40.0	0%	0%	£0	£83.20
Reference (£/MWh)					£5.24	£7.49	-£0.50/ -£1.00	

Trends in PPA terms

Based on the feedback[37] to DECC following their call for evidence on the state of the PPA market in July 2012,[38] there appears to be a worsening in the PPA market, particularly for ROC generators. This is reflected in greater discounting on ROC and LEC values, and a shortening in the term offered to generators from a maximum of 15 to 10 years. The evidence submitted also suggested that less ROC offers included floor prices, making them higher risk and less bankable. This has been reflected in our own research, where the most recent offers discount LEC values by 30% rather than 10%, and take 10% of the ROC value rather than 5%.

In terms of the reasons for these trends, a slowing consumer demand during the downturn and increased risk aversion from the Big six is a partial explanation. However it is also clear that the generation portfolios owned by the Big Six's generation arms now enable them to meet their demand for ROC's from their own projects and existing PPAs, without needing to go to the market.

It remains to be seen what impact the extension of the FiT up to 10MW for 'community' schemes will have on the PPA terms offered to larger community generators, but because of the FiT floor price and fixed tariff level, it is likely to be a positive development- with the proviso that the tariff level itself must be sufficient to bring forward new investment.

37 Responses to call for evidence https://www.gov.uk/government/consultations/a-call-for-evidence-on-barriers-to-securing-long-term-contracts-for-independent-renewable-generation-investment
38 DECCs call for evidence http://www.decc.gov.uk/assets/decc/11/consultation/call-for-evidence-barriers-independent-renewable-generation-investment/5684-call-evidence-barriers-ind-ren-gen-inv.pdf

Other routes for achieving PPAs

In addition to the above, there are also brokers who can offer a range of PPA options dependent on the risk and profit profile of the generator. For example, Smartest Energy, who claims to be the UK's leading purchaser of independently generated electricity and a provider of Power Purchase Agreements and Feed-in Tariffs.

Their portfolio covers more than 650 sites - 31% of the UK's independent embedded renewable capacity – encompassing commercial-scale projects in a wide range of renewable and non-renewable forms of generation.

They can contract with any generator that has a half-hourly, remotely-read, Ofgem-approved export meter installed and their short and long term Power Purchase Agreements and Feed-in Tariff products range from simple fixed priced arrangements to highly flexible contracts designed to maximise opportunities in volatile markets.

In addition, to brokers, it is possible to auction generation. An example of this is Non-Fossil Purchasing Agency Limited (NFPA) which has been involved in renewable energy since 1990 - through administration of generation contracts awarded under the Non-Fossil Fuel Orders (NFFOs).

More recently, its sister company, NFPA Scotland Limited, has become responsible for the administration of contracts awarded through the Scottish Renewables Order (SROs) - the NFFO equivalent in Scotland.

Regular on-line auctions are held for the sale of power and associated Renewable Obligation Certificates (ROCs), Climate Change Levy Exemption Certificates (LECs) and Renewable Energy Guarantee of Origin Certificates (REGOs).

At present, NFPA on-line auctions are held biannually. These auctions are for electrical output which will be produced by generators during a six month period (starting 1st April or 1 October) following the end of the auction.

These auction prices are for electrical output together with, depending on the generation technology, ROCs LECs and REGOs.

Since 1 April 2006, NFPA Scotland has been responsible for the operation of the contracts issued to generators under the three SROs. The 1994 SRO is for 30 contracts with a total capacity of 76.42MW, the 1997 SRO is for 26 contracts with a total capacity of 104.17MW and the 1999 SRO is for 53 contracts with a total capacity of 140.16MW.

Below is a snapshot of prices achieved at auction for January 2013

Technology Band	Average Price p/kWh
Hydro	9.81
Landfill Gas	9.71
MIW	5.24
CHP	5.23
Wind	9.68

8 What does this mean for an RSL ESsCo?

Under the Renewable Obligation an ESsCO must source 20.6% of its energy from renewable sources or to pay a penalty 'buy-out' fee. This provides an incentive to the ESsCo to find sources of reliable and cost effective renewable energy or to generate renewable energy itself.

For an ESsCo targeting low income customers with the goal of reducing the costs of their energy, generating renewable energy provides a number of advantages. These include certainty of supply, certainty of costs for that supply, and an additional profit-line. It also provides the opportunity to 'redistribute' renewable subsidies to those much less likely to be benefit from them.

As detailed in other parts of this report, the policy and political environment has been relatively positive for the development of community renewable generation scheme in the UK and even more so in Scotland. Whilst Scotland has led the way in the UK on community generation schemes, the Scottish Government believes that the time is right to capitalise on this experience and set even higher targets (500mw community and locally owned energy by 2020). This highlights the fact that there is plenty of room for growth.

The development of community owned generation has created many opportunities and challenges. Locally focused control of assets and profits is key as is the requirement to continuing growing small scale production. However, the growth in community owned generation has made only a small dent in fuel poverty objectives so far. Given the ambitions of the partner RSLs and RPE, an ESsCO would provide the opportunity to grow generation and make a very local impact on fuel poverty and through control of costs and supply of energy.

An ESsCO with RSL involvement/ownership could build a platform of skills, resource and reputation, and act as a prime developer or partner in the development of local generation schemes. This would enable:

- Scaling up of individual local schemes in a region or country
- Developing funding platform for development of schemes especially the 20% external funding that is often required to complete the financing
- Become first in class in funding community owned schemes
- Build up the capacity and credibility to develop schemes in partnership with local communities
- Become a trusted and experienced broker in changing the generation game to favour greater community benefit and impacting on fuel poverty
- The creation of a vertically integrated energy chain with a vision for the target customers of RSLs and local communities
- A significant reduction in fuel poverty in Scotland

Together, his would support RSLs with readymade expertise, funding developer experience and packages to deliver specific schemes within a shared or collective vision.

For further information,
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