Department for Business Innovation & Skills

**MIDATA PROGRAMME**

# Feasibility study on the use of QR codes in the energy sector

JANUARY 2014

Scan here for energy prototype

# Contents

# Introduction

This feasibility study report was produced in March 2013 by a QR codes Working Group facilitated by BIS as part of the midata programme. The group comprised twelve organisations who kindly contributed their time and expertise to participate in this feasibility assessment.

This report contains recommendations based on the balance of discussion, hence not every contributing member will necessarily agree with all aspects of the report. The organizations involved were as follows (individual members are listed in the Annex):

British Gas

Consumer Focus[1]

Department for Business Innovation & Skills

Department of Energy and Climate Change

E.ON Energy

EDF Energy

Moneysupermarket

Ofgem

SSE

Telefonica UK

UK Power

Uswitch

Front cover: The QR code is functional and points to an online dashboard illustrating how usage information and advice could be displayed. The other QR codes shown in this report are not functional.

[1] Now Consumer Futures

# Executive Summary

The purpose of this feasibility report is to provide an assessment as to whether it is likely to be commercially and technically realistic to increase and improve consumer engagement with the energy market through the use of QR codes on bills, for scanning by smartphones. The aim of using QR codes is to empower consumers by providing an additional channel to engagement that focuses on alleviating concern about usage and tariff understanding. The report has been compiled through the collaboration of a working group of twelve public and private sector organisations involved in the energy sector.

The report looks at what a QR code solution would look like and what size of potential base of the energy market it might apply to. It then assesses the commercial, technical, cost, benefit, marketing & communication, barriers, risks and opportunities that need to be considered in deciding on a course of action.

Using QR codes to hold an individual's data would be different to the way such codes are currently used for general marketing purposes. There is therefore limited current appropriate market evidence that can be relied upon. Detailed market and other technical analysis is not within the scope of this study. The options suggested in this report therefore reflect the scope and limitations of this phase as a feasibility study rather than a full impact assessment, and should be read as such.

In the spirit of the above, this review gives a starting-point estimate for market size. On average each household now has access to a smartphone and an estimated 20% of smartphone users may be using QR codes by the end of 2013. This means potentially 5.2 million households (20% of consumer energy accounts) could be targeted to use QR codes on energy bills and statements. However, the effective incremental engagement will be reduced by the number of consumers who already engage with the market, in particular those with online accounts. One switching site estimates that one-third of consumers who switch have online accounts.

There is an opportunity to engage consumers without online accounts as well as those online consumers who do not switch for reasons that QR codes might address. QR codes could also support consumers through family and friends with smartphones or by outreach centres with investment in smartphones and training. This could enable an easier way for people to be helped to engage as tariff and usage information would be automatically uploaded into an application that would allow the focus on taking action rather than the problem of finding and entering accurate information.

QR codes can only directly address a proportion of the market but coupled with other channels to engagement, such as improved online solutions, they could be part of an industry message that the sector is trying different ways to simplify and engage people in understanding the tariff and usage data that would empower their decision-making.

Two technical solutions were explored in this study and a preferred solution that is most equitable across the sector was agreed. Twelve data items and the current supplier's URL were agreed as being the data needed to be included. A number of the energy companies assessed the technical feasibility of the solution. An example of how the QR code

containing this information could appear on a bill is provided in this report by one of the energy suppliers.

The cost to energy suppliers is likely to include an initial development to build the mechanism for QR codes to appear on customers bills after which it is likely that they would be a low cost ongoing solution. This finding is based on analysis of current QR Code solutions and responses from participating energy supply companies, a number of whom have indicated that including QR codes on customers bills is not overly burdensome. There will be some level of industry cost to ensure the QR code specification remains current. One supplier, however, remains concerned that there may be additional ongoing compliancy costs due the sector's regulated nature.

In summary, it does therefore appear feasible to include QR codes on bills and statements without significant cost and development.

It is not proposed that there be a requirement on supply companies to build applications to read QR codes. However, responses suggest that there may be significant costs should they wish to do so. This would also require the mobile-optimisation of websites, at a time when other regulatory changes require that development bandwidth. Such development would be a commercial decision for each company but it would be an opportunity to improve overall market engagement, particularly with suppliers' current customers.

However, a simpler and cheaper alternative for the energy supply companies to use the QR codes would be to make use of existing webpages and the midata download. The customer would scan the QR code to be taken to online account management (registering if needed) where they would be directed to the midata download and existing tariff comparison pages. This option would provide switching companies the choice of building applications to read the QR code and/or to upload the existing midata file into their websites.

The cost to switching companies to develop smartphone applications is likely to be much less as more of their sites are already optimised. One switching company estimated a cost of £25k to £100k to build each smartphone application per operating system. Moreover, feedback from the switching companies indicates an interest in developing these smartphone apps that would read the codes to offer energy tariff and usage changes.

There is a risk to the longevity of QR codes. Whilst they are growing in usage (43 per cent increase in the UK from mid-2011 to mid-2012), they are a technology that is at risk of short-term obsolescence from richer image recognition and near field communication applications. It would therefore be sensible to allow a degree of solution flexibility for suppliers to keep development costs down, given this longevity risk. On balance, with their low cost, this suggests an early decision to proceed and implement whilst QR codes usage remains on the increase. Indeed, their general acceptance in the UK could be positively impacted by such use.

Whilst this study has taken the technical solution to a level of detail sufficient to provide an initial assessment of the technical feasibility of putting QR codes on energy bills, further detail such as ensuring consumer protection would be needed in any subsequent stage.

The indications at a feasibility level are that it is commercially and technically realistic to add QR codes to customer bills in the energy sector.

The proposals in this feasibility report have been reviewed (March 2013) with Ofgem to check alignment with the Retail Market Review (RMR) and Bill Simplification initiatives. Ofgem and BIS agree that the aims of QR codes on energy communications are complementary to the RMR in that they support the drive to increase consumer engagement. Similarly, Ofgem have indicated that QR codes are not inconsistent with the goals of bill simplification and are part of discussions at the Consumer Bills and Communications Roundtable.

Companies that use QR codes today do not expect high engagement levels, in a similar way to other broad-brush advertising campaigns. It is the cost per conversion that makes them feasible and used in many different places. It is recommended that QR codes are considered in a similar light in the energy sector.

## Conclusions and recommendations

This study concludes that adding QR codes to energy bills or statements is relatively low cost and technically highly feasible.

The optimisation needed to maximise engagement will require additional commercial investment.

It is recommended that the solution to provide a QR Code with the supplier URL and twelve agreed items of data be adopted as the technical basis for discussion of options on how to progress.

It is recommended that energy supply companies place this QR Code on bills/statements. For clarity, given the opportunity for the market in general to make use of QR codes, it is recommended that supply companies be free to choose whether to develop smartphone applications or existing online account/midata download-based solutions, or not to develop applications that use these QR codes at all.

# Feasibility study

## 1. Objective and scope

The aim of the feasibility study was to analyse the strengths, weaknesses, opportunities and threats of using QR codes as one possible solution for driving consumer empowerment through personal data. It looked at the potential costs and benefits of using QR codes for this purpose and focused specifically on the energy sector.

### Scope and current analysis

Problem Statement: The energy market suffers from low consumer engagement. We need to find additional ways for consumers to quickly and accurately see and understand their energy usage and show them different energy usage and tariff options.

The proposal is to use QR codes to provide an additional mechanism for consumers to engage with the energy market, specifically those with access to smartphones or those who can be reached by support from others with smartphones. By the end of 2013, it is predicted that 20% of smartphone users in the UK will engage with QR codes. Consumer engagement with the energy market is currently low with low volumes of consumers actively switching supplier.

Ofgem's Retail Market Review (RMR) analysis highlights an increase in the number of consumers changing tariff whilst staying with their current supplier. Nevertheless, Ofgem's 2012 tracker survey shows that, whilst switching is high compared to other sectors, the rate of switching has fallen between 2008 and 2011 (from 20% to 15% in gas, and from 19% to 17% in electricity).

Additionally, consumer surveys have found that consumers lack of confidence in their ability to understand and predict energy usage and that this is a key barrier to engagement.

### Potential opportunity

The benefit of automation of key tariff and usage data needed for energy deal comparison is potentially high because in looking for better deals, accuracy and confidence in the data is a real barrier.  QR codes resolve these issues whilst making it easy for the consumer to upload these data. The key challenge for engagement will be whether enough consumers will actually engage with QR codes. The opportunity may be to use QR codes as a trail-blazer that creates confidence in the ability to access accurate price and usage data to, in turn, encourage engagement via means such as online accounts.

The working group discussed one key engagement barrier for consumers being a lack of confidence in collating accurate source data such as previous energy utilisation. There is also evidence that complexity of tariffs is a barrier to engagement.

With such a low cost, QR codes are likely to continue to appear in many places – the low cost means that QR codes don't have to create significant engagement to justify their existence. It is difficult to disrupt an almost free technology like QR codes. They do not require a significant upfront or operational investment and are also very easy to decommission if and when they are overtaken.

QR codes may therefore have a role to play for customers with smartphones who will appreciate the confidence in the data that previously has proven to be a barrier to action. It should be noted though that other initiatives taken as a result of the RMR may also increase this confidence through additional clarity of information.

There are other barriers to consumers engaging with the market that will still apply to any QR Code solution. These issues will reduce the target market that may actually engage via QR codes and are assessed later in this report.

Ultimately the objective of QR codes is to empower consumers to engage with the market. QR codes are a way for consumers to confidently and easily understand the amount of energy used and price paid as well as making it possible to channel the relevant data to services that can help them make purchasing or lifestyle decisions. Embedding such tariff and usage data in a QR code on a bill could be one potential solution to enable consumers to draw on this information without a level of investigation or interpretation that appears to create a barrier to engagement.

A key benefit for consumers in embedding relevant usage and tariff data in a QR code would be to improve their confidence that the correct usage and tariff information would be used in switching assessment.

With over 50% penetration in the UK, smartphones can provide a mechanism to engage with the energy market in a way that is becoming increasingly normal for many segments. A recent future-forecast prediction showed that even the 55-64 age-group will be approaching 50% smartphone ownership by 2014.

QR Code utilisation by consumers continues to increase but does remain in the minority. A Comscore survey in 2012 showed that the number of UK smartphone users scanning QR codes rose by 43% from mid-2011 to mid-2012 to 11.4 percent, or 3.3 milllion users.

QR codes continue to appear – due to their low cost they are an attractive mechanism for marketers. They can be used to supplement high visibility advertising campaigns with a mechanism to seek out more detailed data from the advertising organisation.

Specific segments that could benefit from using QR codes would include those that have a smartphone but not a computer. It is also possible that services could be developed to scan bills on behalf of consumers who have neither a PC or a smartphone. Citizens Advice, for example, could offer such as a service, although this would require investment in smartphones and clarity about the extent of any advice on switching.

To fully predict the potential opportunity that may be provided by QR codes in the consumer energy market, some contributors have argued that consumer research could be a logical next step. However, an alternative would be to carry out a trial with some or all of the energy companies and switching sites to gain empirical evidence.

In terms of implementation cost, QR codes are a cheap technology and once initial development set-up has been done, the ongoing cost is essentially for small amounts of black ink on current paper bills.

## 2. Options assessment and proposed solution

Two solution options were considered by the working group.

**Option 1: Independent landing page**

Consumer uses a QR code reader to scan a QR code on their energy bill. The QR code directs the reader to open an independent internet landing page which contains energy saving messages and options for action, for example, links to switching sites, their own provider's site or to advice sites.

**Option 2: Smartphone app solution**

A standard QR code reader would point the consumer to their supplying company website for messages about best tariff, energy usage and advice. Other companies, such as switching or other energy supply companies could develop smartphone apps that would read the same QR code but instead direct the user to their website or smartphone application to offer alternative or innovative services.

**Option assessment**

The advantages of an independent landing page are that it gives different options to the consumer all in one place. It also means less need for organisations to develop smartphone applications. The development needed would mainly be building an interface between the internet landing page and their own site.

One consequence of the landing page option would be that it would effectively be a "commercial" page with considerations such as which company has the first link on the page and positioning of switching companies versus energy supply companies etc. Whilst this can be managed in a similar way to the order of switching companies on the energy switching Confidence Code website (since this report was written, the Confidence Code has been transferred to Ofgem), this would need ownership. There is no obvious owner to manage such a site going forward although the industry could collaborate to provide one.

A number of companies would also need to develop their website to be mobile-optimised, which some have assessed as significant cost.

The energy supply companies are understandably nervous about an independent landing page where the URL points away from the supply company's site, for two main reasons: Firstly, a lack of control of a customer journey that starts within their own system - this would be a "contact exception" i.e. other contact options on a bill point the customer to the supplying company. Secondly, whilst energy supply companies are comfortable with data portability, they believe they should not be expected actively to promote switching before being able to engage with their customers.

The two options have similar implications for putting more data on the bill. Additionally, the QR code would need accompanying explanatory text on the bill to drive engagement – a "Call to Action", which will be assessed in more detail later in this report.

The proposed application-based solution carries no particular issues over the landing page option whilst having the advantage of not needing to agree on and develop an independent landing site. Its success, however, relies on third party application development. A key advantage is that it is acceptable to all parts of the energy sector as represented by this working group.

The working group agreed that that the smartphone app option, to include both host company URL and full set of data in the QR code, was the preferred way forward. There are twelve data items in addition to the supplier's URL required to enable the different types of engagement for usage and price comparison purposes:

Version Number

Post Code

Current Provider

Current Electricity Tariff

Current Gas Tariff

Current Electricity Payment Method

Current Gas Payment Method

MPAN

MPRN

Electricity Usage

Gas Usage

Start Date

The start date indicates the period when this data is taken from eg the last year, quarter, month, or other period of time. The optimal period is proposed to be 12 months and if less than 12 months data is available, (eg where a customer has a tenure of less than 12 months) an estimate should be made for the period for which data is unavailable. In implementation, it may be appropriate to exclude customers with a tenure of less than 12 months due to estimating risks such as seasonality.

Ofgem and BIS agree that the QR codes findings are complementary to the Retail Market Review and Bill Simplification. The above data-set would need to be aligned with relevant outputs from these initiatives such as the tariff label data to be used across the sector for tariff comparison (TCR, exit fees and personal projection on current tariff).

**Recommendation:** The smartphone app-based solution (Option 2) is recommended as being both the most equitable across the energy industry as well as enabling the most freedom for innovation.

Overleaf is an example (provided by EON) of a bill with a 16mm x 16mm QR code that includes the twelve items of data in 200 characters. The settings used are:

Platform – HP Exstream v7

Module width – 0.03cm

Symbol Version (size) – Automatic

Error correction – L (7%)

Mask Pattern – Automatic

Resolution – 300dpi

## Example of an energy bill containing a QR code

-*- Demonstration Powered by HPExstream 01/23/2013, Version [illegible] -*-

Date 21 September 2012

This is not a tax invoice

Your statement | The details | 1 of 2

FTSHEON/56

Any questions?

Find answers, contact us, and manage your account at eonenergy.com

Call our UK call centres 0800 917 3353

Mon to Fri 8am to 8pm and Sat 8am to 6pm.

**Your account number**

H

Account_Name
Address_Line1
Address_Line2
Address_Line3
Address_Line4
Address_Line5
Postcode

# Electricity and gas statement - estimated

If your actual readings are different to our estimates, go to eonenergy.com/readings or call us on 0800 917 3353

**Site_Address1, Site_Address2, Site_Address3, etc.**

| | |
|---|---|
| **Before this statement f £112.39 CR** | |
| Balance on last statement - 10 Jul 2012 | £27.61 |
| Your payments - thanks<br>£70.00 CR on 01 Aug 12 £70.00 CR on 03 Sep 12 | £140.00 CR |
| **On this statement f £83.86** | |
| Electricity and gas charges - see back for info | £92.74 |
| Rewards | £6.41 CR |
| Dual Fuel Direct Debit Discount | £6.46 CR |
| VAT at 5% on £79.87 | £3.99 |
| Your credit balance is | **£28.53 CR** |

You don't need to do anything - we'll carry this credit onto your next statement.

**Plan and rewards**

For information about your plans - see 'The details' section

**Your rewards on this statement**

| | |
|---|---|
| • Dual Fuel | £2.00 |
| • Online | £1.00 |
| • Loyalty 2 Years | £1.77 |
| • Loyalty 3+ Years | £1.64 |

We'll send you your rewards as a credit message to your meter in whole pounds, twice a year. All you have to do is top up with your E.ON key as normal to pick up the messages. If you move home and are owed any rewards please contact us.

How do your prices compare?

Follow below link on your smart phone

Working out your Energy Tracker

Your electricity average for last year is based on estimated readings. Your gas average for last year is based on estimated readings.

# 3. Market size and target market

In late 2012, comScore released an analysis of QR Code usage. In the UK, the figures was an increase of 43%, increasing the UK QR Code audience to over 3.3 million consumers, representing 11.4% of the smartphone audience.

UK smartphone penetration at 36 million active devices at December 2012 (source: Portio Research) is now over 50% and smartphones make up the vast majority of new mobile phone sales. Predictions are that soon almost all new mobile phones made and sold will be smartphones. Portio Research also predict an annual growth rate of 18% for smartphones, giving a base of 44 million at the end of 2013.

**Market size**

With an estimated 44 million smartphones in the UK at the end of 2013 and QR code usage increasing at the same rate as 2011 to 2012 statistics, an estimate of the potential number of QR code users by the end of 2013 is 8.7million. This represents 20% of smartphone users.

With approximately 26.3 million households in the UK (source: Census 2011), this means on average each household having 1.7 smartphones.

Assuming every household therefore has access to a smartphone, and that QR code usage is evenly distributed across households, this would imply that 20% of all households would have someone who actively engages with QR code content.

**With one energy account per household, this gives an initial approximation of market size based on people who actively engage with QR codes of 5.2 million energy accounts or roughly 20% of the energy market.**

There is evidence that smartphones users will engage in seeking better offers via their device. A study of UK mobile internet users by the Direct Marketing Association UK found that the top reason for using mobile search was for offers and deals, cited by 50% of respondents.

The groups of consumers most likely to naturally engage with the energy market via QR codes may well be those who will already be reasonably engaged via online account management. For this group QR codes may streamline how they identify the tariff and usage information they need via scanning of a QR code from their screen rather than a paper bill. As this is substitution activity, QR codes in this case are unlikely to generate significant additional engagement.

The group of consumers who may be encouraged to engage are smartphone users who do not have an online account or are not actively engaging with their online account in any meaningful way.

One group who may benefit are consumers who have neither online billing or smartphones but who could be encouraged to engage with the market via outreach centres, family or friends with smartphones. QR codes would be a significantly easier way for these people to be helped to engage as tariff and usage information is automatically uploaded into an application that would help the consumer take action rather than achieving accurate information. Outreach centres would need to invest in smartphones and training as well as ensuring clarity of their role in explaining how switching works versus giving switching advice.

QR codes would be just one way to increase engagement. They are not the only automated method that should be investigated as a channel to increase engagement and as such, flexibility in prescribing the actual solution would be appropriate. Online tools that also reduce friction for consumers finding and understanding accurate input data should also be considered as a complementary channel. These should be coupled with consistent messages from the industry that highlight that there are a number of new and better ways to engage in the market.

For smartphone users that engage via QR codes, the effective incremental engagement that would be achieved will, however, be reduced by substitution. The trend is towards paperless billing and managing accounts online. It is reasonable to suppose that already engaged and empowered consumers are leading this trend and may engage via either rather than both of QR codes and online account management. One switching company estimates that a third of switchers have an online energy account.

Similarly, prepayment meter users are amongst the most disengaged consumers. The frequency with which they receive communications depends on the supplier - for some it may just be an annual statement. The opportunity to engage via QR codes may be annually rather than quarterly for such customers. Additionally, not all credit customers receive quarterly bills (Ofcom direct debit leaflet, October 2012).

Consumer Focus research on the efficacy of information on bills from 2011 concluded a number of key points regarding using bills and statements as the focus of engagement:

Looking at the amount of money owed is the only information many consumers engage with on their bills.

There is an over-reliance on the use of bills and Annual Statements as the primary means of engaging consumers to think about energy costs and consumption.

Consumers who are already empowered are the most likely to react to information on bills

Policy makers should be wary of relying on bills as the sole way to inspire behavioural changes among energy consumers.

Existing messages on bills are not reaching more vulnerable and less engaged consumers - alternative channels need to be developed.

# 4. Commercial feasibility

Based upon the prototype statement produced by Eon for this study and from discussion in the working group, there do not appear to be major issues with accommodating QR codes, either from incorporating into the design or branding, from positioning on bills or other logistical challenges.

Whilst some information on the bill is regulated, Ofgem advised the QR code group to work to its updated October 2012 RMR proposals. These proposals prescribe content and positioning but only for part of the bill. The RMR will not refer to QR codes, although they are a consideration for the bill simplification work of the Consumer Bills and Communications Roundtable. It should also be noted that there is nothing currently prohibiting suppliers adding QR codes to bills.

Whilst some supply and switching websites have browser-responsive designs, not all companies do. Such companies wishing to develop smartphone applications that route the consumer directly to their site will therefore need to consider the adaptation of their website for mobile optimisation. Energy companies currently without such capability have indicated this will be a significant development. It is proposed that each company is free to make a commercial decision as to whether to invest in such applications to read the QR codes.

A simpler and cheaper alternative for the energy supply companies to use the QR codes would be to make use of existing webpages and the midata download. The customer would scan the QR code to be taken to online account management (registering if needed) where they would be directed to the midata download and existing tariff comparison pages. This option would provide switching companies the choice of building applications to read the QR code and/or to upload the existing midata file into their websites.

The complexity and richness in features, and therefore cost, of building smartphone applications would be a commercial decision based around expected value for any interested party.

It is also not expected that QR codes should cause any brand issues for energy suppliers. It is recommended that suppliers be free to place a QR code wherever they see fit on the bill, with the minimum requirement that it must be prominent, clearly distinguished from other information and proximate to other relevant information. It should be at least 2cm by 2 cm, and contain either standard or consistent wording that is to be agreed, to act as an engagement “Call to Action” for consumers. This “Call to Action” will be further explored in the section on Marketing Communications.

The smaller the QR code the more risk that lower quality cameras will be unable to read the code, hence a minimum size is recommended. Initial feedback and prototypes from suppliers, albeit with the caveat around the industry not having QR code expertise, is that the data seems likely to be able to be organised in a 2x2 QR code to reflect the supplier URL and twelve items of required data. Error correction can be set to a low tolerance with this size of code.

Printed at actual size the recommended 2x2cm size of QR code is shown below:

## 5. Technical feasibility and development cost

Each bill and statement would contain a unique QR code containing individual customer-specific data. This would lead to millions of unique QR codes for major energy suppliers each month. Generating these codes is free - open source software is available to generate QR codes. This software can easily handle the creation of millions of requests. The printing costs are low as QR codes are essentially the printing of black ink.

A simplified example of impact assessment is as follows: The energy supply company will need to download the software, build a routine into the bill/statement run that creates the QR code from the bill/statement data for sending to the print house. The will be some development work to amend systems to create a print image of an invoice that contains a QR code.

The technical expertise needed is not significant and it is highly likely that the impacted companies would have, or could practically source, such expertise.

Initial indications from the energy supply companies are that the development needed to produce QR codes with the agreed data fields on bills and statements is not particularly large although detailed assessment would be needed to identify specific costs.

Switching sites have also indicated that the development effort is likely to be of an order of magnitude that would appear to be worthwhile given the likely benefit.

A key requirement is that all companies work to the same technical standard. This standard is summarised in Annex – Detailed Technical Assessment.

## 6. Timescales

The underlying assumption is that the QR codes will appear on suppliers' paper bills and annual statements. At the time of writing the nature of the information required to be shown on bills and statements was under review as part of Ofgem's Retail Market Review and it was envisaged that this could present an opportunity to coincide timing and therefore consumer messaging with the inclusion of QR codes as well as help to reduce the cost of development.

# 7. Market cost/benefit

It is expected that switching sites in particular will invest in smartphone applications that read QR codes as the technical cost is relatively low and the benefit is high. Customers often do not enter their energy use when using switching sites and resort to completing averaging input boxes such as Low, Medium or High. This in turn leads to recommendations being generic and potentially inaccurate.

With QR codes resolving the uncertainty for consumers for both tariff and usage, it is expected that commercial competition will drive significant commercial spend on marketing activities by switching sites.

None of the energy companies involved in the working group have indicated that the cost of development to include QR codes on bills and statements would be significant enough to consider a need to directly increase costs to consumers. Clearly, however, all costs are ultimately borne by consumers, hence there should be flexibility to allow development cost to be balanced with standardisation for any QR Code solution.

# 8. Marketing communication – calls to action

At the time this report was written it was estimated that approximately 20% of smartphone users would engage with QR codes by the end of 2013. As shown in the market size section of the report, this would give a similar percentage of energy account holders engaging, assuming each household has access to a smartphone.

However, the nature of the marketing communications associated with including QR codes on bills will be a highly significant factor in how many of this 20 % engage specifically in Energy Sector QR codes.

Messages surrounding the QR Code on a bill or statement are essential to enable engagement. Messages such as "scan me for details of the cheapest tariff" could be extremely powerful. These messages could be the same regardless of whether the customer scans with a standard QR code reader to stay with in their energy suppliers "walled garden" or are taken by an app that takes them to an alternative supplier, switching site or advice site. However, such standardisation may limit innovation in apps that use such QR codes. It will therefore need to be agreed whether standard or consistent wording (where suppliers are free to develop their own text within guidelines) is appropriate.

The use of QR codes in the way envisaged in this report is somewhat different to their established marketing role. This difference may impact consumers understanding of their role on energy bills, leading to unwillingness to scan them. It will therefore be critical to ensure there is appropriate explanatory text accompanying the QR code to explain their role on the energy bill.

QR codes will need a Call to Action and communication activity to promote the opportunity they provide in energy engagement.

A centralized, industry-wide communication is recommended to ensure consumers are made aware of the fact of and the reasons for QR codes appearing on bills and statements so that the benefits for consumers are made known.

This could take the form of a separate communication or via energy companies and switching sites.

Studies have shown that there are three key points that organisations publishing QR codes must build into their campaigns:

- the QR code must be sized and positioned so that the user will notice the QR code, and find it easy to scan;
- the user must believe that they may benefit from scanning it; and
- some users will require instructions on what a QR code is.

**Therefore it is essential to include a Call To Action accompanying the QR code to encourage the reader to scan the code.**

Positioning of the QR Code on bills and statements will need to allow space for the call to action.

## 9. Barriers to engagement

Any QR code proposal has two key barriers to overcome. Firstly, the lack of engagement by consumers with the energy market and secondly, the somewhat limited engagement of consumers with QR codes themselves.

There is, however, potential for these barriers to be reduced by a new kind of third party service that can offer a delegated authority to engage with the energy market, from the data provided in the QR code. These services would perform the activity that the consumer currently chooses or finds difficulty engaging with and agreeing with the consumer when contact will next be made for next offer or advice.

These services could be provided informally via family and friends (smartphones) or by outreach services such as enhanced switching services or advice centres such as Citizens Advice. The role of outreach centres in giving advice rather than assistance would need to be considered, however.

These opportunities may increase engagement. Until such applications appear in the market, it is difficult to assess by how much engagement would be increased.

The table overleaf shows an outline of common problems and barriers to consumer engagement in the energy market. It assesses the extent to which QR codes may offer

mitigation by linking consumers who have the desire and means to utilise them, and services that address these barriers. Engagement in this context refers to price comparison and switching behaviours. A number of the barriers can overlap – number 1 can contribute to number 4, which then exacerbates number 6, for example.

**Barriers to engagement in the energy sector**

| Barrier to switching | Can QR codes help? |
|---|---|
| **1. Confusion marketing (difficult to determine lifetime cost of contract)** – "I can't tell whether this is the best deal for me or not" | Yes — or at least data that QRC5 act as portal to can help |
| **2. Tariff proliferation / choice overload** – "where do you start?" | Yes (plus Ofgem's RMR will reduce number of energy tariffs on offer) |
| **3. Mis-selling / slamming (switching without permission)** – "I can't believe they did that" | Partially on mis-selling – *if* QRCs offer gateway to accurate data, which supports better informed decisions via services that offer transparent and impartial comparison. |
| **4. Fingers burnt before** – " wont be doing that again" | No |
| **5. Perception that suppliers constantly move prices in lock-step** – nothing to be gained | Could have "dry run" service where consumer makes "virtual" switching decisions. After defined periods, price movements across markets are mapped against consumer's usage & current tariff data (which QR code provides gateway to). This enables assessment of how virtual choices performed. This could help consumers become familiar with processes and determine whether they could actually achieve a saving. Could build in energy efficiency dimension too. |
| **6. Low-to-no trust in providers/insufficient scope for differentiation** – "they're all as bad as one another" | No |
| **7. Time poor** – "I don't know when I'll fit that in" | Potentially, if non-QR code users can be persuaded that QRCs are a means to reduce time spent on energy market engagement. |
| **8. Electronic access to "own situation" data & market pricing information** – "I don't have the internet don't use the internet for transactions" | Dependent on advice providers. Some assessment of their capabilities required. |
| **9. Contract lock in and termination fees** – "I'm stuck where I am for the minute" | Potentially - dependent on "nudging" at the right point in time |
| **10. The above in combination(s)** – "it's too much hassle for too little return" | Potentially in some instances |

# 10. Consumer Protection

The solution being proposed in this feasibility report assumes that customer data is not stored on the smartphone, rather, that the smartphone passes the data to a third party application. The risk of data abuse is also expected to be reduced because the paper bill with other relevant personal data is also required to be able to scan the code into the smartphone, thus adding little additional risk.

At this level of assessment it has not been possible to explore all possible data protection issues. Whilst this is a vital area that needs to be understood fully, it is recommended that this is a key area for expert advice during any subsequent detailed solution specification.

# 11. Risk to longevity

As well as barriers to engagement and consumer protection as discussed in the previous sections, there are also risks around the take-up and longevity of QR codes generally. QR codes are a very cheap technology and as such are very common and are in widespread use in just about every newspaper, magazine, billboard advert and much product packaging. Whilst, as with any cheap technology, QR codes are not easy to disrupt, they may well have a short lifespan purely due to the pace of technological advancement.

Threats to QR codes include image recognition applications such as Google goggles and Blippar, which scan images to provide additional search information or experiences to users. Image recognition applications may be more attractive to marketers as they can be integrated or make use of brand images in a way that QR codes can't.

An additional threat to QR codes may be Near Field Communication (NFC) technology which provides short range transfer of data between devices. Targeted to support a whole contactless payment ecosystem, NFC has the advantage of being embedded into a smartphone making NFC more convenient to use than QR codes which need both an application and camera.

The advantage that QR codes have over both image recognition and NFC is far lower cost. With their ability to hold more data it may be that QR codes themselves further disrupt traditional bar codes. This may be particularly possible in the supply chain (where QR codes started life). Ultimately, it may be this low cost that gives QR codes their longevity as anyone with a black and white printer can produce one, unlike image recognition and NFC.

By containing personalised data, the use of QR codes in energy would be different to the majority of current QR code applications which are in the main general marketing signposts. However, it is helpful to show examples of take-up of QR code campaigns in the UK during 2012:

- In the first half of 2012 Transport for London received 5,000 scans per month from QR codes in London posters.

- In 2012, an in-store Clubcard promotion by Tesco received an average of 5,000 scans per month, totalling over 80,000 by the end of the year.

- During 2012, some train tickets contained a QR code on the back of the ticket. Without any "call to action" to explain what benefit could be had by scanning the code, a total of 25,000 users still scanned it.

The fact that QR codes continue to be used by major companies despite low levels of takeup is evidence in itself of their importance. The low level of investment needed means they can be used as just one channel to consumer engagement, with the necessary break even takeup very low because of their low cost.

This is also how QR codes should be seen in the energy sector. It is recommended that they be seen as an interim, low-cost step, amongst others, that may increase consumer engagement. In fact, messages that the industry is moving forward in trying to find alternate methods to make engagement easier may be the most important benefit of QR codes, regardless of actual takeup.

QR codes may have a limited lifespan and appeal. However, as a low cost channel they are just one way of engaging. Whilst we need more ways to engage, QR codes could play a role for certain customer types. Given the intended use in energy, there is no direct or analogous available research that might serve as a true indicator of uptake.

On balance, using QR codes on bills, given their relatively low cost, does appears to be a reasonable choice, particularly if a decision is taken to implement in the short term.

## 12. Opportunity for further innovation

The working group explored potential future opportunities that QR might be able to provide the energy sector. The following is an illustrative list of ideas by way of example potential opportunities:

| | |
|---|---|
| "Scan for a video explaining how to lag a pipe/ fit more energy efficient lightbulbs" | "Scan here to submit your meter reading by text" (increase engagement as a bridge to smart-meters) |
| Validating customers identity or cheaper tariff eligibility via QR scanning with additional info | "Scan here to see how your energy provider sources its power and from how far away" (similar to supermarket packaging "meet our farmers" |
| Triggering and diarising activity – "scan to add your contract end date, bill due date or meter reading date to your calendar" | Engagement with consumers who are also energy generators eg using solar panels |
| App linked to Energy UK energy consumption tool asks consumer household info questions to provide tailored advice or offers | "Scan to download (company) app from the app store". |
| Gateway to your energy data & comparison - people like you | "Scan here for a quick quote" |
| "Scan to add energy contact numbers to your contacts" | "Scan for a chance to win a new boiler/energy saving bulbs" |
| Loyalty programmes – "scan to see your options for points" | Energy Games – including opportunity to simulate the impact of energy usage or switching before doing so for real |

The working group consider that innovation around the three key aspects of efficiency, individual and additional data capture could provide opportunity for further benefit.

QR codes could also provide an opportunity for outreach to vulnerable consumers, whether by family members or outreach centres such as Citizens Advice, Post Office etc. With the input of accurate information, better informed advice can be provided. As well as the hardware requirement, the key consideration will be to make the application simple in order to minimise training for outreach staff or volunteers.

Family and friends with smartphones may be of significant interest as the barriers would be reduced for these individuals by avoiding creating an online account for their family member or finding multiple bills. They should find using their own smartphone with the need for only one bill or statement a far easier way of engaging on behalf of their family or friend.

QR codes could also provide an opportunity to test for eligibility for cheaper tariffs for vulnerable people via an initial engagement, for example through a meter reading, followed by an additional request for information via an app.

**Future opportunity**

Once applications are developed and embedded as a natural way for consumers to engage with the energy market, there is potential to further develop such applications to encourage consumers to think about energy usage as well as price. For instance, energy gamification could play a key role in future smartphone applications. Applications could also be developed by energy supply companies to allow customers to submit data usage, reducing the inaccuracy of estimated bills (some companies already offer this). This could fill the gap and normalise an increased level of involvement in advance of smart meters.

## 13. Use case

The following is an indicative use case for QR codes in the energy sector:

Alice receives a bill.

On Alice's bill is a printed QR code.

There is a call to action "Scan this code in order to understand your bill" (or similar wording).

The QR code contains a URL

- eg EnergyCompany.xx/QR?data=122345|abc|98776|.....

We envisage three scenarios:

1) Alice scans the QR code with her phone's standard scanner.

It takes her to her energy provider's website. The website interprets the query string and displays Alice's usage - and any other data the company wishes to provide.

(If this is a very old bill, the energy company may choose to ignore the data in the query string)

2) Alice scans the QR code with her Energy Provider's app.

The app interprets the query string and, rather than taking her to the web, shows her energy usage on the app.

3) Alice scans the QR code with a third party app (eg uSwitch).

The app interprets the query string and, rather than taking her to the web, shows her tariffs she could switch to in order to save money.

## 14. Appropriateness in energy Sector

As individual sectors move increasingly towards promoting online as the default way of managing accounts, the opportunity for using QR codes will reduce. Currently, the energy sector remains significantly paper-billing, and as such there is at least a short term opportunity to use QR codes on paper bills.

It is possible to scan QR codes that appear on-screen, ie when customers log-in to their online account. It may be that some consumers may indeed scan such a code and engage using QR codes. The likelihood of this is difficult to assess, however.

# Annex – Detailed technical assessment

The solution is based on three foundations.

1. Customers **must not** need a specific QR scanner to access their information.

2. Customers who have "price comparison" QR scanner **must** be able to extract their information from the QR code.

3. The QR code should be as small as possible to fit on the bill.

Proposed schema which could include all the data we need.

01AA9A9AA:TELECOMPLUSTHEUTILITYWAREHOUSE:FIXEDDISCOUNT2010STANDARDEXISTINGCUSTOMERSONLY:QUARTERLYCASHORCHEQUE:FIXEDDISCOUNT2010STANDARDEXISTINGCUSTOMERSONLY:QUARTERLYCASHORCHEQUE:12345678999990123456789931233123

QR codes just hold text. Having two separate data objects in a single code would be confusing for the majority of scanners on the market.

Therefore, we propose that the schema proposed form the query string of the URL.

http://EnergyCompany.web/?qrnrg=01AA9A9AA:TELECOMPLUSTHEUTILITYWAREHOUSE:FIXEDDISCOU...

This way, normal scanners will go straight through to their energy supplier's website. The energy supplier can extract the information from the query string, and display their customer's usage etc.

Any third party app could scan the QR code, recognise the URL, and extract the information from the schema. They could then use it for their own purposes.

The code would look something like the following (overleaf):

Obviously, this code is very large - despite using the lowest level of error-correction.

Using only the essential information, we can shrink the code to

Considerably smaller and simpler.

We can make the code smaller by shrinking some of the fields. For example "QuarterlyCashOrCheque" could be changed to "4CC". As long as the abbreviations are standardised and published, there should be no issue for third party readers.

It is not recommended that we follow a standard URL compliant with the W3C definition and encoded in **application/x-www-form-urlencoded** format (name/value pairs connected by = signs and concatenated by & signs). Whilst this provides flexibility and scope for growth of the spec while maintaining backwards compatibility, and allows to completely remove unused fields, it will substantially increase the size of the QR code. Here's what it might look like if we make it say:

mpan=XXXX&tariff=1234 etc:

We could minimise the size using single/two letter names for the parameters (mpan to m, tariff to t, etc) as well as looking for ways to compact the data (i.e. use HEX instead of Decimal for long numbers).

Alternatively, we can shrink the size of the QR code by using a URL shortener. For example, the URL

http://energy.web/?qrnrg=ID=01AA9A9AA&NAME=TELECOMPLUSTHEUTILITYWAREHOUSE&TARIFF=FIXEDDISCOUNT2010STANDARDEXISTINGCUSTOMERSONLY&PAY=QUARTERLYCASHORCHEQUE&DISCOUNT=FIXEDDISCOUNT2010STANDARDEXISTINGCUSTOMERSONLY&METHOD=QUARTERLYCASHORCHEQUE&OTHER123456789999012345678993123312 3

could become: Insert xwlVtm

http://bit.ly/XwlVtM

We would not recommend using Bit.ly or another public service due to privacy concerns. But one can easily be supplied by the industry, or each company can use their own.

Third party scanners would still be able to extract the information from the QR code looking at where it redirects and extracting the information from the query string (doing a HEAD request and looking at the 30X response).

This solves two problems. 1) We no longer need a huge area for the physical code on the bill. 2) We can have all the parameters as &bill=zxxx&info=1233 etc. The code would be reduced in size:

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