Title: Legislation to require energy suppliers to provide key, personal information on consumers bills in a machine readable format **IA No:** DECC0152 **Lead department or agency:** Department of Energy and Climate Change **Other departments or agencies:**	**Impact Assessment (IA)** **Date:** 17/01/2014 **Stage:** Consultation **Source of intervention:** Domestic **Type of measure:** Secondary legislation **Contact for enquiries:** Iven.stead@decc.gsi.gov.uk

Summary: Intervention and Options

RPC: AMBER

Cost of Preferred (or more likely) Option				
Total Net Present Value	**Business Net Present Value**	**Net cost to business per year** (EANCB in 2009 prices)	**In scope of One-In, Two-Out?**	**Measure qualifies as**
£-3.7m	£-3.7m	£0.5m	Yes	IN

What is the problem under consideration? Why is government intervention necessary?

The majority of domestic gas and electricity consumers do not engage in the retail electricity and gas markets through switching of their energy supplier. The Office for Gas and Electricity Markets (Ofgem) estimated in its Retail Market Review (RMR) that only 5-10% of customers are proactive switchers.[1] This lack of engagement and switching leads to the market not operating as effectively as it could, potentially resulting in higher prices for consumers due to a lack of competitive pressure. As identified by Ofgem in its RMR, one of the key barriers to effective consumer engagement in the energy market is a lack of clarity in the information given by suppliers to consumers on tariff options and individual consumption levels.[2] Government intervention is necessary because suppliers may not have sufficient incentives to voluntarily provide customers with their own data in an accessible, machine readable format. Data provided in this format would bring additional benefits to those brought about by Ofgem's implementation of its RMR proposals.[3]

What are the policy objectives and the intended effects?

The Government's objective is to take appropriate action to ensure that domestic retail energy consumers benefit from access to their own, key energy consumption, tariff and expenditure data in a form, which is clear and easy to understand. This should help overcome an informational barrier to consumer engagement in the domestic retail energy market. Third sector volunteers providing vulnerable consumers with 'assisted action' through the The Big Energy Saving Network and other third sector led outreach events, should also be able to make use of the machine readable information to encourage switching.[4] It is expected that machine readable formats will, in the future, allow third party intermediaries to develop services and products which help consumers by frictionlessly uploading and analysing their data for them to provide a tailored cross market tariff comparison. The intended effect would be quicker, easier tariff comparisons and increased switching of consumers between suppliers, thereby increasing competitive pressure in the retail energy market.

[1] Ofgem (2011) 'The Retail Market Review – Findings and Initial Proposals: Supplementary appendices' [web], available at: https://www.ofgem.gov.uk/ofgem-publications/39709/rmrappendices.pdf

[2] Ofgem (2013) 'The Retail Market Review - Final domestic proposals' [web], available at: https://www.ofgem.gov.uk/ofgem-publications/39350/retail-market-review-final-domestic-proposals.pdf

[3] Ofgem (2013) 'The Retail Market Review – Implementation of Simpler Tariff Choices and Clearer Information: Decision' [web], available at: https://www.ofgem.gov.uk/sites/default/files/docs/decisions/the_retail_market_review_-_implementation_of_simpler_tariff_choices_and_clearer_information.pdf

[4] DECC (2013) 'Ensuring a better deal for energy consumers: Government Response to consultation on DECC's discussion document' [web], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/200051/gov_response_ensuring_better_deal_consumers.pdf

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

We have considered the following options:

Option 0: Do nothing.

Option 1: (preferred option) Oblige suppliers to place, on all domestic consumers' paper energy bills, consumer's own data, in a non-proprietorial machine readable format, which if scanned by a generic smartphone reader would provide access to 12 key pieces of data in a manner which is clear and easy to understand.

Only one policy option is considered in this IA because the primary powers which exist in the draft Energy Bill are narrowly defined. The draft bill unambiguously gives the government powers to require suppliers to place machine readable formats on energy bills, with little scope for alternative options.[5]

Option 1 has been assessed against a baseline of "do nothing", in which the powers, granted by the preceding primary legislation to oblige suppliers to place consumers' data in machine readable formats on all paper domestic consumer energy bills, are not exercised.

Option 1 is the preferred option because it helps to overcome one of the key informational barriers to consumer engagement in the retail energy market – consumers' lack of confidence in collating accurate tariff and usage information.

Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** 01 / 2018

Does implementation go beyond minimum EU requirements?			**N/A**		
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.	**Micro: No**	**< 20: Yes**	**Small: Yes**	**Medium: Yes**	**Large: Yes**
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)			**Traded: NA**	**Non-traded: NA**	

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Minister: ..... Date: .....

[5] See section 139 of the draft Energy Bill, availale at: http://www.publications.parliament.uk/pa/bills/lbill/2013-2014/0057/lbill_2013-20140057_en_12.htm#pt6-ch1-pb1-l1g139

Summary: Analysis & Evidence

Policy Option 1

Description: Oblige suppliers to place, on all domestic consumers' paper energy bills, consumer's own data, in a non-proprietorial machine readable format, which if scanned by a generic smartphone reader would provide access to 12 key pieces of data in a manner which is clear and easy to understand.

FULL ECONOMIC ASSESSMENT

Price Base: Year 2013	PV Base: 2013	Time Period: 10 years	Net Benefit (Present Value (PV)) (£m)		
			Low: -4.9	High:-2.5	Best Estimate: -3.7

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	0.1	1	0.4	**2.5**
High	0.1		0.9	**4.9**
Best Estimate	0.1		0.7	**3.7**

Description and scale of key monetised costs by 'main affected groups'

Under this option, suppliers will incur one off set up costs. These will include acquiring software to produce the machine readable image, redesigning the bill and changing the bill generation and printing processes Suppliers will also face the on-going costs of printing the image on consumer bills. At the Midata Programme Industry forum, where a range of energy suppliers had representation, no concerns about the opportunity cost of space on consumers' bills were raised. Therefore, the opportunity cost to suppliers of the space on the bill used to contain the machine readable format is expected to be zero.

Other key non-monetised costs by 'main affected groups'

Volunteers working as part of the DECC funded Big Energy Saving Network and other third sector led outreach events, targeting vulnerable consumers with a programme of 'assisted action', will be able to make use of the machine readable images to encourage switching.[6] Increased levels of switching, compared to the baseline scenario, amongst vulnerable consumers will reallocate economic surplus from suppliers to consumers, representing an indirect cost for energy suppliers.

Easier access to the information required to compare tariffs and switch supplier can be expected to increase levels of switching, compared to the baseline scenario, amongst the wider population – those not targeted by outreach events – which in turn will reallocate economic surplus from producers to consumers, representing an indirect cost for energy suppliers.

It is expected that third parties, for example switching sites, will develop applications to utilise the data embedded in the machine readable formats in order to offer consumers tariff and usage changes.[7] To the extent that this brings about increased levels of switching, compared to the baseline scenario, economic surplus will be reallocated from producers to consumers, representing an indirect cost for energy suppliers. DECC considers it highly likely that third parties, for example switching websites, will develop these applications.

It has not been possible to monetise these costs due to uncertainty about:

- the degree to which the machine readable images will bring about additional switching, and the timescales over which this could occur, on top of the level which would be expected in the baseline scenario.
- the likelihood of, and timescales for, third parties, for example switching sites, developing applications to utilise the machine readable formats.

[6] DECC (2013) 'Ensuring a better deal for energy consumers: Government Response to consultation on DECC's discussion document' [web], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/200051/gov_response_ensuring_better_deal_consumers.pdf

[7] BIS (2014) 'Feasibility study on the use of QR codes in the energy sector', p.17 [pdf], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/276198/bis-14-519-midata-programme-feasibility-study-on-use-of-qr-codes-in-energy-sector.pdf

BENEFITS (£m)	**Total Transition** (Constant Price)	Years	**Average Annual** (excl. Transition) (Constant Price)	**Total Benefit** (Present Value)
Low	0	1	0	**0**
High	0		0	**0**
Best Estimate	0		0	**0**

Description and scale of key monetised benefits by 'main affected groups'

It has not been possible to monetise the benefits of option one due to lack of evidence and and the level of uncertaintly around the exact impacts of the policy. See the 'Non-Monetised Benefits' section which follows for further explanation.

Other key non-monetised benefits by 'main affected groups'

Consumers will benefit from easier access to their own, key data in a clear and easy to understand format.The improved availability of this information may increase consumer engagement in the retail energy market.

The Big Energy Saving Network and other third sector led outreach events, targeting vulnerable consumers with a programme of 'assisted action', will be able to make use of the machine readable images to encourage switching.[8] Increased levels of switching, compared to the baseline scenario, amongst vulnerable consumers will reallocate economic surplus from suppliers to consumers, representing an indirect benefit for consumers.

Easier access to the information required compare tariffs and switch supplier can be expected to increase levels of switching, compared to the baseline scenario, amongst the wider population – those not targeted by outreach events – which in turn will reallocate economic surplus from producers to consumers, representing an indirect benefit for consumers.

Additionally, as the energy market is not perfectly competitive, suppliers may currently price above marginal cost for a proportion of their customer's tariffs, which may cause 'deadweight loss' to society. By increasing competitive pressure in the retail energy market, the policy may reduce this 'deadweight loss' and bring about net gains to society. On this basis, the gains to consumers brought about by increased levels of switching may be expected to slightly outweigh the corresponding losses to producers.

Suppliers may choose to comply with the policy by optimising the consumers experience gained from a 'vanilla' reading, for example by generating URL web addresses and offering consumers a choice of uploading their data into an optimised section of their suppliers website.[9] These web pages could manipulate the data, for example to allow intra-supplier tariff comparisons, which would represent an indirect benefit for consumers.

In addition, third parties, for example switching sites, may develop applications to utilise the data embedded in the machine readable formats in order to offer consumers tariff and usage changes.[10] To the extent that this brings about increased levels of switching, compared to the baseline scenario, economics surplus weill be reallocated from producers to consumers, representing an indirect benefit for consumers. DECC considers it highly likely that third parties, for example switching websites, will develop these applications.

It has not been possible to monetise these benefits due to uncertainty about:

- the degree to which the machine readable images will bring about additional switching, and the timescales over which this could occur, on top of the level which would be expected in the baseline scenario
- the likelihood of, and timescales for, third parties, for example switching sites, developing applications to utilise the machine readable formats
- the current price and marginal cost structure of the retail energy market
- the extent to which the policy will increase competitive pressure in the retail energy market

Wider non-monetised include increased competition and innovation, new and expanding infomediary markets, and changes in energy consumption.

[8] DECC (2013) 'Ensuring a better deal for energy consumers: Government Response to consultation on DECC's discussion document' [web], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/200051/gov_response_ensuring_better_deal_consumers.pdf

[9] A 'vanilla' reading is the result of scanning the machine readable format with a common, freely available scanning application on smartphone or similar.

[10] BIS (2014) 'Feasibility study on the use of QR codes in the energy sector', p.17 [pdf], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/276198/bis-14-519-midata-programme-feasibility-study-on-use-of-qr-codes-in-energy-sector.pdf

Key assumptions/sensitivities/risks 3.5

It has been assumed that there are 20 energy suppliers for domestic consumers.

It has been assumed that it will take a team of two systems designers one week to redesign each of the bill printing and generation process. It has also been assumed that it will take a team of two graphic designers one week to redesign the bill in order to incorporate the machine readable format on the bill. The appraisal period for the options is the 10 years from 2014 – 2023, whereas that the legislation has a sunset clause meaning the power may not be exercised after 31st December 2018. However, the appraisal period is justified because we can expect the legislation to be extended until the roll out of smart meters is universal. During years 7-10 of the appraisal period - from 2020-2023 - the costs and benefits of the policy can be expected to be zero because the legislation is not expected to be extended beyond the end of 2019.The full roll out of smart meters should be completed by 2020, rendering the need for machine readable information on bills obsolete[11].

The EANCB has been calculated for the six year period over which the policy is active, from 2014-2019. If the EANCB had been calculated over 10 years it would have been £0.3m.

For any one supplier, there is a risk that they opt to comply with the legislation by choosing a machine readable format which becomes obsolete. This would increase costs for any supplier affected by their chosen technology becoming obselete.

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			**In scope of OIOO?**	**Measure qualifies as**
Costs: 0.5	**Benefits: 0**	**Net: -0.5**	Yes	IN

[11] DECC and Ofgem (2011) 'Smart Metering Implementation Programme - Response to Prospectus Consultation' [web] available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42742/1475-smart-metering-imp-response-overview.pdf

Evidence Base (for summary sheets)

Background

1. This Impact Assessment (IA) examines the implementation of the Primary Legislation powers, which were the subject of a previous IA[12], to require suppliers to provide key information on energy bills to domestic customers in a form that allows smart phones, or similar, to read and use it (referred to as "machine readable format" throughout the IA). This IA accompanies a consultation on the implementation of the powers and considers the costs and benefits of implementing the powers.

2. Only one policy option is considered in this IA because the primary powers which exist in the draft Energy Bill are narrowly defined. The draft bill unambiguously gives the government powers to require suppliers to place machine readable formats on energy bills, with little scope for alternative options.[13]

3. This proposed piece of legislation is part of a wider landscape of government initiatives to improve engagement in the retail energy market. Please see the 'Other initiatives to improve consumer engagement' section below for further details. It will also build upon the benefits brought about by Ofgem's implementation of its RMR proposals.[14]

Government Empowerment and Midata

4. In April 2011, the Government launched its Midata project, to allow domestic consumers to view, access and use their personal and transaction data in a way that was portable and safe, as part of its Consumer Empowerment Strategy[15]. As part of this project the "Big 6" energy suppliers, which supply 99% of domestic energy customers, have already agreed to give domestic consumers access to their consumption and tariff data securely. Consumers can elect to receive this in a data file which can be sent to their own email address, or view the data on their supplier's website. Consumers can use this information to better understand their consumption and compare their tariff details to other offers in the market.

5. The Department for Business, Innovation and Skills (BIS) published a consultation on the Government's Midata initiative in July 2012[16], seeking views on the need for legislation requiring suppliers of goods and services to provide, on request of the consumer, personal transaction data in an electronic format. The Government response to the consultation, published November 2012[17], sets out, amongst other things, the leading role of the energy sector in the Midata programme.

6. Following this, amendments were made to in the Enterprise and Regulatory Reform Bill to establish an order-making power to require suppliers to provide access, upon request, to consumers own transaction data in an electronic format. The Enterprise and Regulatory Reform Act achieved Royal Assent in April 2013[18]. These powers remain unexercised and voluntary progress is still being sought from the energy, banking (current accounts and credit cards) and mobile phone sectors.

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[12] DECC (2013) 'Consumer Tariff Amendments (power g) - Power to require suppliers to provide key information to customers in a form that allows smart phones to read and use it' [web], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/197629/consumer_tariff_amendments_powers_g.pdf

[13] See section 139 of the draft Energy Bill, availale at: http://www.publications.parliament.uk/pa/bills/lbill/2013-2014/0057/lbill_2013-20140057_en_12.htm#pt6-ch1-pb1-l1g139

[14] Ofgem (2013) 'The Retail Market Review – Implementation of Simpler Tariff Choices and Clearer Information: Decision' [web], available at: https://www.ofgem.gov.uk/sites/default/files/docs/decisions/the_retail_market_review_-_implementation_of_simpler_tariff_choices_and_clearer_information.pdf

[15] BIS (2011) 'Better choices: better deals. Consumers powering growth',[web] available at: https://www.gov.uk/government/publications/better-choices-better-deals-strategy-helping-consumers-make-better-choices

[16] BIS (2012) 'Midata 2012 review and consultation' [web], available at: https://www.gov.uk/government/consultations/midata-2012-review-and-consultation

[17] ibid

[18] Detailed legal information on this act is available at: http://www.legislation.gov.uk/ukpga/2013/24/contents/enacted

7. The Midata project provides proof of concept; it has shown how consumer data release can operate and progress has been made on establishing a vision and principles. We also understand better the current consumer and business perceptions and the need for safeguards when consumers use their data. Providing data in this way enables those consumers who elect to receive information electronically to better understand their consumption and helps them compare their existing tariff to others in the market.

8. In DECC's discussion document 'Ensuring a Better Deal for Consumers', the government proposed taking this a step further by not only providing consumers data in an electronic format, but one that would make this data instantly available and portable.[19] Contingent on the development of applications by third party intermediaries, data in such a format would give consumers the ability to frictionlessly upload that data to search for a better deal.

Smart Phones and Machine Readable Formats

9. There are a number machine readable formats that allow smart phones to read and use the information contained within it. Currently the most typical format is a Quick Response (QR) Code[20], but there are also similar technologies, such as EAN bar codes.

10. The potential for helping consumers through smart phones is large and increasing rapidly, with 51% of UK adults owning such a device as of Q1 2013, which is a substantial increase from 39% in Q1 2012[21]. In addition, there has also been a growth in household take-up of tablet computers (which can also read machine readable formats) more than doubling from 11% in Q1 2012 to 24% in Q1 2013[22]. If third party intermediaries were to develop applications which can read and utilise the machine readable formats, energy consumers who own a smart phone or similar device, and are aware of the benefits of these applications would then be able to use them to quickly and easily compare tariffs and switch supplier.

11. Whilst machine readable formats would benefit those who have their own device, it also has a wider reach via friends and family and advisory services such as Citizens Advice, and particularly to vulnerable consumers who are targeted by outreach events. Ofgem, in their Retail Market Review consultation document, cited evidence that "friends and family were also seen as useful sources of information and advice. This appeared to be especially true for older and some more vulnerable consumers."[23] Therefore, these machine readable formats could benefit older and vulnerable consumers through their friends and relatives providing the smart phone or similar devices to read the formats. If third party intermediaries were to develop applications which can read and utilise the machine readable formats, older and vulnerable consumers could also reap the benefits of these applications via their friends and family who own smart phones or similar.

12. According to comScore, a market analytics firm, 11.4% of the UK smartphone users scanned QR codes using their device in the year to July 2012.[24] However, there are alternatives to QR codes, such as image recognition applications. These applications search for information based on photos taken by smart phones or similar devices. Some applications can be used to scan a wide range of retail products as well as codes on major landmarks and shops. Others are aimed at advertisers and allow static adverts to be brought to life with interactive audio-visual content.

[19] DECC (2012) 'Ensuring a better deal for energy consumers: DECC discussion document' [web], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/66515/6996-better-deal-energy-consumers.pdf
[20] A QR code is a form of matrix barcode consisting of black squares arranged on a white background. It is characterised by fast readability and greater storage capacity compared to standard UPC barcodes.
[21] Ofcom (2013) 'Communications Market Report' [web], available at: http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports/cmr13/market-context/uk-1.003
[22] ibid
[23] Ofgem, (2012) 'The Retail Market Review: Updated domestic proposals' [web], available at: https://www.ofgem.gov.uk/ofgem-publications/39457/retail-market-review-updated-domestic-proposals.pdf
[24] comScore (2012) 'QR Code Usage Among European Smartphone Owners Doubles Over Past Year' [web], available at: http://www.comscore.com/Insights/Press_Releases/2012/9/QR_Code_Usage_Among_European_Smartphone_Owners_Doubles_Over_Past_Year

Application of of machine readable formats codes to gas and electricity markets

13. In April 2012, the Deputy Prime Minister announced an agreement with energy suppliers, to commit to work with Government, to investigate the possibility of putting QR codes on energy bills and annual statements to facilitate switching through smart phones.[25] BIS led the work to consider, with the industry, technical issues that need to be resolved, such as data size limitations and consumers' data protection and security. BIS's evaluation of QR codes suggests that they can be helpful in facilitating access to data and removing friction at low cost. Although this work does not seek to mandate that suppliers place a QR code specifically, on consumer's energy bills, it is considered that the BIS evaluation is relevant to other machine readable formats.

14. The BIS work on Midata and the voluntary agreements on information and QR codes are complementary to Ofgem's Retail Market Review (RMR) measures which look to encourage and equip consumers to get the best deal from the energy market.[26] Ofgem's RMR measures will limit the number of core tariffs suppliers can provide, prescribe simpler tariff structures and mandate suppliers to move customers on poor value "dead" tariffs to better value "open" ones.[27] They will also require suppliers to provide personalised information on bills about the cheapest tariff with their current supplier as well as a standardised Tariff Comparison Rate (TCR) to facilitate more meaningful tariff comparisons with other suppliers.[28]

15. In May 2013, DECC published its response to the consultation, 'Ensuring a Better Deal for Consumers'[29], the government set out its intention to take powers in the Energy Bill to require suppliers to place Quick Response (QR) codes on consumers' bills, taking the BIS led work on Midata in the energy sector a step further

Other government initiatives to improve consumer engagement

Smart Meters

16. The Government is requiring energy companies to install smart meters for their customers and they will be rolled out as standard across the country by 2020.[30] This is consistent with the aims of this regulation in providing consumers access to their own data easily. The addition of machine readable formats to energy bills will provide all domestic energy consumers, who receive paper bills, with access to their own information until the smart meter roll out is complete. The sunset clause for this regulation is set to coincide with the completion of the roll out. Once smart meters have full coverage, they will supersede any informational benefit from machine readable images on consumers' bills.

EU Energy Efficiency Directive

17. The EU Energy Efficiency Directive includes provisions requiring energy suppliers to make billing information and consumption data available to consumers. The addition of machine readable formats to domestic consumers' energy bills complements the Directive.

[25] DECC (2012) 'Government and energy suppliers reach agreement to help consumers get best deal' [web], available at: https://www.gov.uk/government/news/government-and-energy-suppliers-reach-agreement-to-help-consumers-get-best-deal
[26] Ofgem (2013) 'The Retail Market Review – Implementation of Simpler Tariff Choices and Clearer Information: Decision' [web], available at: https://www.ofgem.gov.uk/sites/default/files/docs/decisions/the_retail_market_review_-_implementation_of_simpler_tariff_choices_and_clearer_information.pdf
[27] A 'dead' tariff is one which is no longer available to new customers. An 'open' tariff is one which is currently available to new customers
[28] Ibid
[29] DECC (2013) 'Ensuring a better deal for energy consumers: Government Response to consultation on DECC's discussion document' [web], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/200051/gov_response_ensuring_better_deal_consumers.pdf
[30] DECC and Ofgem (2011) 'Smart Metering Implementation Programme - Response to Prospectus Consultation' [web] available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42742/1475-smart-metering-imp-response-overview.pdf

Collective switching

18. Collective purchasing and switching is when consumers get together to negotiate a group deal with their gas and electricity suppliers. DECC launched the £5 million Cheaper Energy Together fund in October 2012. The fund supported the development of collective purchasing and switching schemes by local authorities or third sector organisations in England, Scotland and Wales. These events are targeted at particular groups in society, whereas machine readable formats will be on the energy bills of all consumers who receive paper bills. In October 2013 DECC reported on the progress of schemes funded by Cheaper Energy Together. The schemes are considered to have been effective in engaging with consumers, with just over 21,000 household switching energy suppliers. This has delivered total savings of just over £2.7 million to date.[31]

Face to face advice

19. Analysis provided as part of Ofgem's Retail Market Review showed widespread consumer disengagement with energy markets, which was most pronounced amongst vulnerable consumers.[32] Whilst Ofgem's Retail Market Review proposals aim to provide domestic energy consumers with simpler and fewer tariffs and clearer and better information to help them better engage with the energy market, many vulnerable consumers will need extra help and advice to engage with the energy market and to give them the confidence to take decisions that will reduce their bills.
20. For many vulnerable consumers this means the provision of face to face advice by trusted sources, such as friends and family or trusted third sector organisations. That is why DECC has provided £900,000 funding for the Big Energy Saving Network; a programme of consumer outreach led by around 500 specially trained energy advisers from voluntary organisations and community groups.[33] Trained volunteers will deliver advice sessions throughout this winter to vulnerable consumers and provide training to the frontline workers that support them. The outreach programme will focus on helping consumers take concrete steps to reduce their energy costs, by taking action on tariffs, switching and energy efficiency offers.
21. The Network will complement existing outreach initiatives such as Big Energy Saving Week, a national awareness raising campaign designed to connect vulnerable consumers with the range of help and advice available as well as schemes such as Energy Best Deal, which provides a comprehensive and broad range of energy help and advice for both consumers and advisors alike.
22. Whilst tariff and switching information is provided to vulnerable consumers through these programmes and campaigns, the need to manually input energy data from paper bills and statements of account at such public events to tariff comparison websites on portable electronic devices, makes this process time consuming, cumbersome and potentially off putting for some consumers. Machine readable formats on energy bills will make possible, through the instant access to key tariff and consumption data on a bill, the provision of fast and accurate tariff advice directed at vulnerable consumers at outreach events, as well as enabling friends and family to help vulnerable consumers make better informed tariff choices.

Problem under consideration

23. In a perfectly competitive market both consumers and suppliers have full information on anything that might influence their respective decision-making processes, for example supplier costs, alternative products and prices. However where a party has incomplete information, they are at a disadvantage in the market. At present, suppliers are better informed than individual consumers about their own information, particularly domestic consumers, leaving consumers at a competitive disadvantage.

[31] DECC (2013) 'Helping Customers Switch: Collective Switching and Beyond' [web], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/253862/Helping_Customers_Switch_Collective_Switching_and_Beyond_final__2_.pdf

[32] Ofgem (2011) 'The Retail Market Review –Findings and initial proposals', pp.28-9 [web] available at: https://www.ofgem.gov.uk/ofgem-publications/39708/rmrfinal.pdf

[33] DECC (2013) 'Ensuring a better deal for energy consumers: Government Response to consultation on DECC's discussion document' [web], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/200051/gov_response_ensuring_better_deal_consumers.pdf

24. Ofgem provided clear evidence in its RMR that the majority of domestic consumers do not engage in the energy market and are paying more than they would be if they were on a lower available tariff. [34] "Sticky" customers (indicated by low levels of switching) make it difficult for new energy suppliers to enter the market to attract a customer base. Ofgem's tracker survey shows just 11% of gas customers and 12% of electricity customers switched their supplier in 2012, which is a decline below the level of 2011. This is a fourth year of decline for gas customers and a fifth year of decline for electricity customers.[35]

25. The fact that the majority of customers do not shop around to seek out the best deals and that suppliers can differentiate their offers between new and existing customers means there is less pressure on suppliers to compete (see Box 1) than in a perfectly competitive market. This makes market entry by new suppliers difficult, potentially resulting in higher prices for the majority of consumers that do not engage.

Box 1: Impact of consumer disengagement on competition

Consumers play a key role in a well-functioning market. Through their active participation and choices in the market, consumers put pressure on suppliers to offer the products that consumers want at competitive prices. However, in theory 'sticky' customers can create for suppliers a degree of slack and reduce the incentive to drive down costs and to innovate to meet consumers' preferences. This can potentially lead to higher prices for consumers. In order to be active, consumers need to have a clear understanding of how to access, assess and act on market information to choose the best product and tariff.

In general, when suppliers make excess profits or act inefficiently, this should incentivise new entrants into a market. However, consumer disengagement puts new entrants to the retail market at a potential disadvantage. Any new entrant has to offer larger discounts to incentivise consumers to switch than they would have to if the market featured a more engaged and reactive consumer base. Unlike incumbents, by definition new entrants have no sticky customers that were inherited at the time of market liberalisation. Instead, they have had to compete to gain all their customers, meaning that all of their customers were at one point (and possibly still are) active in the market. The customers of new entrants are more likely to switch than those of incumbents, and therefore new entrants cannot segment their customers in the way incumbent suppliers can.

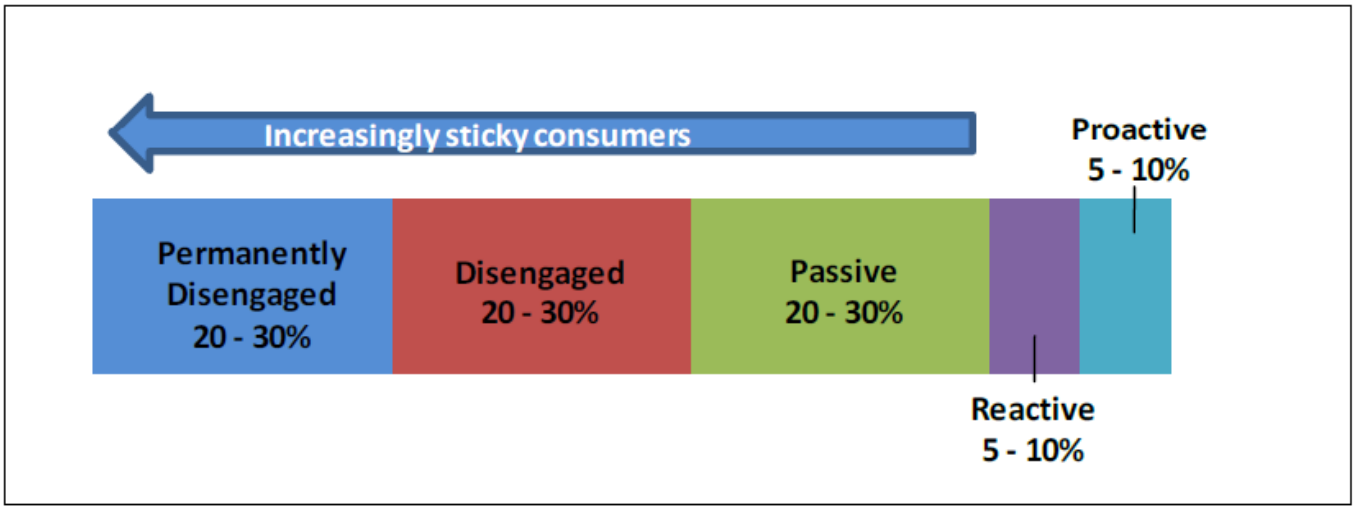
This market structure enables the incumbents to offer more competitive tariffs to those who do switch whilst keeping the tariffs of sticky customers higher (see Annex B paragraph 82). The fact the large incumbent suppliers are able to undercut new entrants due to their more profitable large 'sticky' customer base makes new entrance difficult. This potentially increases the incumbents' market power.

However, Ofgem's RMR measures aim to introduce a fairer and more transparent tariff framework and to make it more difficult for suppliers to subsidise cheap deals through "sticky customers".[36]

26. In their 2011 'The Retail Market Review – Findings and Initial Proposals' document, Ofgem segmented energy consumers into five categories.[37]

[34] Ofgem (2011) 'The Retail Market Review – Findings and Initial Proposals: Supplementary appendices' [web], available at: https://www.ofgem.gov.uk/ofgem-publications/39709/rmrappendices.pdf
[35] Ipsos MORI (2013) 'Consumer Engagement with the Energy Market – Tracking Survey 2013' [web], available at: https://www.ofgem.gov.uk/ofgem-publications/74756/customer-engagement-energy-market-tracking-survey-2013.pdf
[36] Ofgem (2013) 'The Retail Market Review – Implementation of Simpler Tariff Choices and Clearer Information: Decision' [web], available at: https://www.ofgem.gov.uk/sites/default/files/docs/decisions/the_retail_market_review_-_implementation_of_simpler_tariff_choices_and_clearer_information.pdf
[37] Ofgem (2011) 'The Retail Market Review – Findings and Initial Proposals: Supplementary appendices' [web], available at: https://www.ofgem.gov.uk/ofgem-publications/39709/rmrappendices.pdf

Figure 1: Ofgem's segmentation of energy consumers, in terms of their attitudes and behaviour towards engaging with the energy retail market



These segments can be defined as follows:

27. *Proactive consumers*: are likely to have switched supplier or tariff within the last year. They research alternative offers themselves and will switch supplier without the need for prompting.

28. *Reactive consumers*: are also likely to have switched supplier or tariff within the last year. They do not necessarily shop around or plan to switch, but may switch as a result of an encounter with a sales agent.

29. *Passive consumers*: are those who report switching at some time in the past, but have not in the last year. Our research tells us that many of these consumers have switched once, most often to a dual fuel offering either with British Gas or their incumbent electricity supplier. Having made an initial saving with their first switch they are not particularly likely to switch again.

30. *Disengaged consumers*: are those customers who report never having switched but don‘t rule out switching in the future. Many disengaged consumers may only decide to switch in reaction to poor service from their supplier or following an encounter with a sales agent. They generally have little knowledge (and in some cases little interest) of the energy market.

31. *Permanently disengaged consumers*: those consumers that claim to have never switched and are unlikely to switch in the future. They are the stickiest consumers and many are likely to be vulnerable consumers.

32. Ofgem concluded that the reasons for lack of consumer engagement in the retail energy market (see Box 2) include the proliferation of tariffs and complex tariff structures which make it difficult for consumers to compare tariffs and understand which offer the best value for them, and the lack of clear information on bills. Another factor is a lack of awareness that cheaper tariffs exist.[38] Many consumers are not confident enough to engage in the market and/or are put off by the perceived hassle and time it takes to switch supplier. Others may be aware that there are savings to be made but in the absence of a specific prompt or trigger to act, choose to remain with the tariff they are already on.[39] Two further barriers are a lack of confidence amongst consumers in collating accurate tariff and usage information; and a lack of confidence in understanding and predicting energy usage.[40]

[38] SPA Future Thinking (2012) *Options for cheapest tariff messaging on customer communications: Report of qualitative research* [web], available at: https://www.ofgem.gov.uk/ofgem-publications/39450/options-cheapest-tariff-messaging-customer-communications.pdf
[39] Ibid
[40] BIS (2014) ‘Feasibility study on the use of QR codes in the energy sector’, p.7 [pdf], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/276198/bis-14-519-midata-programme-feasibility-study-on-use-of-qr-codes-in-energy-sector.pdf

Box 2: Barriers to effective consumer engagement

Ofgem has carried out consumer research and analysis to assess the barriers to consumer engagement which they have presented its March 2013 RMR document, 'The Retail Market Review – Final domestic proposals'.[41] The barriers to engagement that Ofgem identified are:

- *Complex tariffs* – the number of different tariff structures on offer are confusing, with complex structures, including multi-tier tariffs and various discounts applied. This puts off many consumers from searching, leads some consumers to abandon their search, may result in an increased frequency of poor switching decision and contributes to a lack of trust in the industry.
- *Inadequate information* – there is evidence to suggest that consumers find information that they are sent from suppliers difficult to understand and use, particularly for vulnerable customers.
- *Lack of trust and poor supplier* conduct – there is evidence that the overall perception of the energy industry is fairly negative, and suggests that consumers believe suppliers make it deliberately difficult to switch supplier.

Behavioural economics also suggests that consumers have:[42]

- *Limited capacity to assess complex information*, when making decisions on switching. Time and attention are a scarce resource for an individual and so use rules of thumb when the information they need to assess is complex; this often results in non-optimal decisions.
- *'Status quo bias'* – consumers have a tendency to not change from what they are currently doing unless they face strong reasons to do so.
- *Loss aversion* – consumers feel more strongly about losing rather than gaining value, and therefore could be less likely to switch for fear they may be worse off.
- *High discount rate* – consumers put more weight on the costs/hassle of switching than the gains they could achieve over a longer time period by switching.

33. In October Ofgem introduced new licence conditions to implement its RMR measures which are intended to overcome the barriers it identified during the course of the review. These include: [43]

    - Limiting suppliers to four tariffs per fuel;
    - Banning complex tariffs;
    - Standardising the discounts and special offers;
    - Requiring suppliers to notify consumers when a fixed term tariff is coming to an end;
    - Requiring suppliers to tell their customers about the cheapest tariff available for them and provide clearer information so that they can compare their tariff to those offered by other suppliers.

34. Research from Ofgem's March 2011 Consumer First Panel shows that not all consumers are aware that they require a range of data to help them review their energy options, including the cost and features of their current tariff, their consumption and details of alternative tariffs which will inform whether a switch would be beneficial. [44] It highlights lack of information about the consumer's current tariff as a barrier and concludes that consumers need to have access to clear information that enables them to make accurate decisions about their energy options at each stage of this 'customer journey'.

35. Feedback from outreach events has tended to support this finding. Whilst organisers (e.g. Citizens Advice) were able to engage with consumers on the range of energy help and advice available to them, the degree to which they were able to offer advice on tariff and switching options was constrained by a range of factors, including uncertainty as to the best tariff options suitable for each consumer's circumstances. This was in part due to a lack of basic information about their existing tariff, payment method and consumption. Although RMR reforms will require suppliers to provide key

[41] Ofgem (2013) 'The Retail Market Review - Final domestic proposals' [web], available at: https://www.ofgem.gov.uk/ofgem-publications/39350/retail-market-review-final-domestic-proposals.pdf

[42] Ofgem (2011) 'What can behavioural economics say about GB energy consumers' [web], available at: https://www.ofgem.gov.uk/ofgem-publications/39711/behavioraleconomicsgbenergy.pdf

[43] Ofgem (2013) 'The Retail Market Review – Implementation of Simpler Tariff Choices and Clearer Information: Decision' [web], available at: https://www.ofgem.gov.uk/sites/default/files/docs/decisions/the_retail_market_review_-_implementation_of_simpler_tariff_choices_and_clearer_information.pdf

[44] Ipsos MORI (2012) 'Consumer engagement with the energy market, information needs and perceptions of Ofgem - Findings from the Ofgem Consumer First Panel Year 4: second workshops (held in March 2012)' [web], available at: https://www.ofgem.gov.uk/ofgem-publications/39452/consumer-engagement-energy-market-information-needs-and-perceptions-ofgem.pdf

information in a tariff label on bills and other communications,[45] machine readable formats on bills codes will make it more accessible and portable.

36. These are the specific problems that the addition of machine readable formats on domestic energy consumers will help.

Rationale for Intervention

37. Intervention is needed to ensure that energy companies provide consumers with their data not only in a machine readable format, but which is also readily accessible and portable. By improving accessibility of information consumers can participate more effectively in the market. If successful, consumers will be in a better position to choose the best products and tariffs for them. This increased engagement should increase competitive pressure.

38. Furthermore, third party intermediaries have indicated that they would be highly likely to develop applications to read and utilise the machine readable format. This would allow quicker and easier tariff comparisons both within and between suppliers, facilitating increased levels of switching.

39. BIS have made progress with the midata project and have an order-making power to require suppliers in the energy, banking (current accounts and credit cards) and mobile phone sectors to provide access to consumers own transaction data in a portable electronic format, but not necessarily a machine readable format. Energy suppliers have also worked with Government, to investigate the possibility of putting QR codes on energy bills and annual statements to facilitate switching through smart phones.

40. The voluntary progress made by the Midata initiative in the energy sector so far does not provide consumers with access to their own data unless they have an online account. This legislation, relating only to paper bills, will better target the problem of disengagement as those consumers without online accounts are more likely to be disengaged.

41. However, it is not clear that there will be sufficient incentives for suppliers to work voluntarily with Government to develop this technology in a way which could enable cross market comparisons and make switching to an alternative supplier easier and more effective. There has been no progress towards a voluntary agreement to introduce QR codes or similar onto consumers bills despite the conclusion of the BIS led the work to consider, with the industry, the technical issues that need to be resolved, which suggested that they can be helpful in facilitating access to data and removing friction at low cost.

42. The Midata programme's independent Chair, Professor Nigel Shadbolt has advised that "for individuals the costs of gathering and processing their own personal data for their own purposes are currently so high that few do so".[46] In his view working solely through the voluntary programme is unlikely to change that in a way that results in a mass-scale, permission and trust based sharing of electronic data, which he believes, will be an essential cornerstone for an efficient, innovative 21st century economy able to compete effectively on the future global stage.

43. The Government intends to support the BIS led voluntary work through the introduction of legislation, increasing the likelihood and timeliness of the potential benefits from using QR codes, or similar technology, to enable cross market comparisons and switching. This is complementary to the licence changes announced following Ofgem's RMR and the current review of TPIs.

Policy Objective

44. The Government's objective is to take appropriate action to ensure that domestic retail energy consumers benefit from access to their own, key energy consumption, tariff and expenditure data in a

[45] Ofgem (2013) 'The Retail Market Review – Implementation of Simpler Tariff Choices and Clearer Information: Decision' [web], available at: https://www.ofgem.gov.uk/sites/default/files/docs/decisions/the_retail_market_review_-_implementation_of_simpler_tariff_choices_and_clearer_information.pdf

[46] BIS and Cabinet Office (2012) 'Impact assessment for midata', p. 9 [web], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32689/12-944-midata-impact-assessment.pdf

form which is clear and easy to understand. This should help overcome an informational barrier to consumer engagement in the domestic retail energy market.

Options Considered

45. This section examines the costs and benefits of implementing the Primary Legislation powers which requires suppliers to provide key information to domestic customers in a machine readable format on paper energy bills that allows smart phones, or similar, to read and use it.

46. Only one policy option is considered in this IA because the primary powers which exist in the draft Energy Bill are narrowly defined. The draft bill unambiguously gives the government powers to require suppliers to place machine readable formats on energy bills, with little scope for alternative options.[47]

Baseline / 'do nothing' option

47. In order to analyse the impacts of implementing the powers requiring suppliers to provide key information to consumers on energy bills in a format that allows smart phones to read and use it, the policy option has been assessed against a "business as usual" baseline scenario. In this business as usual case, secondary legislation to implement the requirement is not brought forward.

48. All of the big 6 energy suppliers now provide their customers with data in an electronic, machine-readable format. Currently, this is in the form of a comma-seprarated values (.csv) file.[48] On its own, we believe the voluntary programme will not deliver any further additional benefits to those already in place.

49. The voluntary progress made by the Midata initiative in the energy sector so far does not provide consumers with access to their own data unless their energy is supplied by the Big 6 and they have an online account or elect to receive it in a data file which can be sent to their email address. This legislation, relating only to paper bills, will better target disengaged consumers.

50. The Government may additionally seek to exercise the powers of the Enterprise and Regulatory Reform Act in order to compel energy suppliers to release customers' personal data to them. As discussed above, the government will also still conduct a series of assisted action events, designed to target the severely disengaged. This is aimed to improve engagement amongst these more vulnerable groups who may not have direct personal access to smartphone technologies.

51. DECC switching statistics tell us that, in the twelve months to June 2013, 3.2 million electricity customers and 2.1 million gas customers switched suppliers.[49] This accounts for 11% and 10% of the total electricity and gas customer base, respectively, in June 2013 and represents a continued decline in the switching rate over the years. Roughly 1.0% of electricity customers and 0.8% of gas customers switch supplier each month.

52. In our baseline scenario we assume that, in the absence of secondary legislation on machine readable formats, the switching rate will increase due to Ofgem's new domesic supply licence conditions resulting from it's implementation of RMR. However, due to the scale of the retail energy market and the wide scope of disengagement, we would not expect the potential switching gains to be exhausted by the the new licence conditions. Machine readable formats can be expected to bring about benefits over and above those brought about by the RMR.

Option 1

53. It has been decided to legislate to require suppliers to provide key information to domestic energy customers in a machine readable format on their paper energy bills. This IA presents one policy option compared against the baseline "do nothing" scenario.

[47] See section 139 of the draft Energy Bill, availale at: http://www.publications.parliament.uk/pa/bills/lbill/2013-2014/0057/lbill_2013-20140057_en_12.htm#pt6-ch1-pb1-l1g139

[48] A .csv file format consists of a number of records of information, each of which is split into a number of fields which are separated by delimiters. This delimiter is usually a comma, but could also be a semi-colon or a tab.

[49] DECC (2013) 'Quarterly Energy Prices'[web], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/244603/qep271.xls

54. This option is to oblige suppliers to place, on all domestic consumers' paper energy bills, the consumer's own data, in a non-proprietorial machine readable format, which if scanned by a generic smartphone reader would provide access to 12 key pieces of data in a manner which is clear and easy to understand. The machine readable image will have to be a minimum of 2cm x 2cm in area and must be on either the front of back of the first page on the bill.

55. As part of the Midata project, a working group was set up to consider the feasibility of using QR codes in the retail energy sector. The working group was made up of government departments, industry, the regulator, consumer groups and third party intermediaries. The working group agreed that 12 items of data (listed below) should be accessible via the machine readable image.
    - **a.** Version number
    - **b.** Post Code
    - **c.** Current provider
    - **d.** Current electricity tariff
    - **e.** Current gas tariff
    - **f.** Current electricity payment method
    - **g.** Current gas payment method
    - **h.** Meter Point Administration Number (MPAN)
    - **i.** Meter Point Reference Number (MPRN)
    - **j.** Electricity usage over twelve months to bill/statement date
    - **k.** Gas usage over twelve months to bill/statement date
    - **l.** Start date

56. In addition the working group also recommended that the machine readable image be a minimum size of 2cm x 2cm in order to reduce the risk that lower quality cameras will be unable to read the format. See figure 2 below for an overview of different types of machine readable format as well as competing technologies.

57. This policy option requires the data be clear and easy to understand when the consumer uses a smart phone, or similar, to read the machine readable format. At a minimum, the data must be clealy visible and accompanied by relevant defintions and descriptions. Data in a continuous text string would not be compliant with the legislation. Beyond this, suppliers have scope for innovation with regards to how they ensure compliance with this.

58. One of the benefits of this policy will be to better facilitate engagement and engagement by vulnerable consumers at outreach events or by friends and family in particular. The use of QR codes or similar at such events would require consumers to bring along a copy of their bill (to be scanned by a trusted third sector representative). To better ensure that the data and image are brought along to such an event it has also been decided that the machine readable image must be presented on either the front or the back of the first page of the paper bill.

59. Furthermore, to ensure that consumers can genuinely utilise the power of their own data, and facilitate the development of applications which utilise this data, non-proprietary software must be used in the development of the machine readable format so that any existing machine that is built to read images, i.e. a "vanilla" reader, can do so.

Figure 2: Summary of main machine readable formats and competing technologies

Technology	Description	Example Image	Data storage capacity
Quick-Response (QR) Code	A QR code is a form of matrix barcode consisting of black squares arranged on a white background		Up to 1852 characters
Universal Product Code (UPC)	A UPC-A barcode consists of a scannable strip of black bars and white spaces, above a sequence of 12 numerical digits		12 numerical digits
Image recognition	A query image is compared to a large database of reference images - quite similar like text search you know from search engines on the web. Upon identifying the reference image, information associated with it is returned.		None - The reference image itself does not contain any kind of code

Impacts of Policy Options

Monetised Costs of Option 1

Transition costs

60. Under this option, suppliers will incur one off set up costs. These will include acquiring software to produce the machine readable image, redesigning the bill and changing the bill generation and printing processes.[50]

[50] BIS (2014) 'Feasibility study on the use of QR codes in the energy sector', p.16 [pdf], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/276198/bis-14-519-midata-programme-feasibility-study-on-use-of-qr-codes-in-energy-sector.pdf

61. Free, open source software is readily available to generate QR codes, which are fit for the purpose of holding 12 pieces of information that can be read by a "vanilla" reader. Open source software is also freely available to generate alternative machine readable formats, such UPC barcodes. Therefore it is estimated that there will no software costs to energy suppliers.

62. In order to incorporate the machine readable format onto the bill, work will need to be carried out by suppliers to re-design their bills, and re-organise their processes for generating and printing bills each billing period. To estimate the cost of re-designing the bill, it's assumed that two graphic designers are required to work for one week. This equates to a total cost of £1,300 for each supplier or £26,000 for all 20 suppliers.

63. As for the cost of re-organising their processes for generating and printing the bill, it is assumed that two systems designers are required to work for one week on each of these processes. The cost of this has been estimated to be £4,300 for each supplier or £87,000 for all 20 suppliers.

64. For these calculations, all employees are assumed to work the average working week as per the latest ONS labour market statistics.[51] The hourly cost of labour is taken from the 2012 Annual Survey of Hours and Earnings data, at 4 digit occupational level.[52] GDP deflators from HMT are used to adjust these costs to be in real 2013 prices.[53] Non-wage labour costs are assumed to be 27% of the wage cost, in line with the latest HMT Green Book publication.[54]

Recurring costs

65. Suppliers will also face on-going costs of printing the machine readable images on consumers bills. As the working group noted,[55] the printing costs for a QR code is simply the cost of ink. Suppliers are assumed to minimise costs by printing any machine readable image in black and white. These costs will only be incurred by the proportion of consumers who receive paper billing as the legislation only requires suppliers to apply the machine readable format to paper bills. The costs of ink are based on a U.S. industry report on printing costs.[56] This cost of printing a QR code has been estimated to be 0.3 pence per bill, while the cost of an alternative machine readable format has been estimated to 0.5 pence per bill.[57] Across all suppliers, these costs amount to, respectively, £448,000 per year and £895,000 per year, on the basis that in total 24.7m electricity and 19.5m gas bills are printed each year.[58] The difference between the upper and lower printing cost estimates is driven by the relatively low ink costs of a QR code. These costs have been calculated on the basis that QR codes, which are characterised by black squares on white background, will require half as much ink as an alternative format. The central estimate of the printing costs is calculated as a simple average of the upper and lower estimates, giving a figure of £671,000 per year.

66. There is potentially an opportunity cost associated by requiring suppliers to place a machine readable image on consumers bills. This would be equal to the benefit suppliers could realise from the best alternative use of that space, for example advertising their products. However, at the Midata Programme Industry forum, where a range of energy suppliers had representation, no concerns about the opportunity cost of space on consumer's bills were raised. Therefore, the opportunity cost to suppliers of the space on the bill used to contain the machine readable format is expected to be zero.

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[51] ONS (2013) 'Labour Market Statistics, October 2013' [web], available at: http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-279443

[52] For systems designers, the SOC10 code is 2135, for graphic designers it is 3421 and web designers it is 2137. See: http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-280149 for the average hourly wage figures.

[53] HM Treasury (2013) 'GDP deflators at market prices, and money GDP: September 2013' [web], available at: https://www.gov.uk/government/publications/gdp-deflators-at-market-prices-and-money-gdp-march-2013

[54] HM Treasury (2011) 'The Green Book: Appraisal and Evaluation in Central Government' [web], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/220541/green_book_complete.pdf

[55] BIS (2014) 'Feasibility study on the use of QR codes in the energy sector', p.16 [pdf], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/276198/bis-14-519-midata-programme-feasibility-study-on-use-of-qr-codes-in-energy-sector.pdf

[56] http://www.qualitylogic.com/tuneup/uploads/docfiles/QualityLogic-Cost-of-Ink-Per-Page-Analysis_US_1-Jun-2012.pdf

[57] These figures are consistent with internal estimates of DECC's printing costs

[58] It is assumed that 89% of electricity customers and 88% of gas customers receive paper bills, taken from the DECC estimate of the proportion of customers whe are not on online tariffs. See DECC (2013) 'Quarterly domestic energy customer numbers' [web], available at: https://www.gov.uk/government/statistical-data-sets/quarterly-domestic-energy-price-stastics

67. There are no direct monetised costs to consumers under Option 1. However, if suppliers pass the costs of this policy onto consumers, they will face an indirect cost.

68. Evaluated over a ten year period from 2014 to 2019, the NPV of the costs of policy option 1 is estimated to be in the range £2.5m – £4.9m. The central estimate of £3.7m is calculated as a simple average of the two.

Non-Monetised Costs of Option 1

Indirect costs of increased levels of switching amongst vulnerable consumers

69. Big Energy Savings Network and other third sector led outreach events, targeting vulnerable consumers with a programme of 'assisted action', will be able to make use of the machine readable images to encourage switching.[59] Increased levels of switching amongst vulnerable consumers, compared to the baseline scenario, may reallocate economic surplus from suppliers to consumers, representing an indirect cost for energy suppliers.

Indirect costs of increased levels of switching amongst 'passive' consumers

70. Easier access to the information required to compare tariffs and switch supplier can be expected to increase levels of switching, compared to the baseline scenario, amongst the wider population – those not targeted by outreach events – which in turn may reallocate economic surplus from producers to consumers, representing an indirect cost for energy suppliers.

Indirect costs of increased levels of switching due to third party application developments

71. Third parties, for example switching sites, may develop applications to utilise the data embedded in the machine readable formats in order to offer consumers tariff and usage changes.[60] To the extent that this brings about increased levels of switching, compared to the baseline scenario, economic surplus may be reallocated from producers to consumers, representing an indirect cost for energy suppliers.

72. It has not been possible to monetise these categories of cost due to uncertainty about:
    - the degree to which the machine readable images and possible third party applications will bring about additional switching, on top the level which would be expected in the baseline scenario
    - the likelihood of third parties, for example switching sites, developing applications to utilise the machine readable formats

[59] DECC (2013) 'Ensuring a better deal for energy consumers: Government Response to consultation on DECC's discussion document' [web], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/200051/gov_response_ensuring_better_deal_consumers.pdf

[60] BIS (2013) Midata Programme Industry Forum, p.6

Summary tables – cost impacts of options 1

Table 1: Costs under Options 1 (£m 2013)

		Option 1		
	Item	**Low**	**High**	**Central**
One-off costs	Acquiring software to produce image	0	0	0
	Bill redesign	0.03	0.03	0.03
	Amending bill/statement generation and printing process	0.09	0.09	0.09
	TOTAL:	**0.11**	**0.11**	**0.11**
Recurring annual costs	Costs of printing	0.45	0.9	0.67
	TOTAL:	**0.45**	**0.9**	**0.67**

Table 2: Net Present Costs under Option 1 over the appraisal period: 2014-23 (£m 2013, present value)[61]

		Low	High	Central
Option 1	One of costs	0.11	0.11	0.11
	Recurring annual costs (in total)	2.38	4.77	3.58
	TOTAL	**2.49**	**4.88**	**3.69**

Monetised Benefits of Option 1

73. It has not been possible to monetise the benefits of option one due to lack of evidence and and the level of uncertaintly around the exact impacts of the policy. See the 'Non-Monetised Benefits' section which follows for further explanation.

Non – Monetised Benefits of Option 1

74. It is considered that the introduction of machine readable formats on energy bills will change the behaviour of two main groups of customers: vulnerable consumers who are targeted by assisted action events and are considered to fall into the disengaged and permanently disengaged (see description of vulnerable consumers below) and passive consumers who are not targeted by assisted action events.

75. It is considered that the most engaged consumers, proactive and reactive consumers, are most likely to have electronic billing and so will not receive a machine readable format on their energy bills.

Direct benefits of improved access to information

76. As a result of implementing this policy, passive consumers will benefit from easier access to their own, key data in a clear and easy to understand format.The improved availability of this information may increase consumer engagement in the retail energy market by breaching a key informational barrier to consumer engagement in the retail energy market. It will allow consumers to better understand and predict their energy usage.

[61] The central estimates are calculated as the arithmetic mean of the low and high estimates

77. Disengaged and permanently disengaged consumers will also have access to their own data, but given the definition of these groups it is considered that they will need support, for example from an outreach event, in order to gain benefit from the machine readable format on their energy bills.

Indirect benefits to vulnerable consumers via 'assisted action' events

78. In the Government's response to DECC's discussion document, "Ensuring a Better Deal for Consumers", published in May 2013, a commitment to fund the creation of the "Big Energy Savings Network" was announced.[62] These events are designed to support vulnerable consumers to engage in the energy market. However, as stated in the 'Problem under consideration section', these events, while successful, have not been able make a lot of progress with helping vulnerable consumers switch.

79. Ofgem, as part of its Consumer Vulnerability Strategy, defined vulnerable consumers as satisfying one or both of the following criteria:[63]

    - They are significantly less able than a typical consumer to protect or represent his or he interests in the energy market
    - They are significantly more likely than a typical consumer to suffer detriment, or that detriment is likely to be more substantial

80. Ofgem define detrimental situations as including struggling to afford bills, living in a cold inefficient home, facing pressure sales tactics, struggling to understand and act upon information or choices (such as getting the best deal), or lacking the confidence or ability to pursue a query or complaint.

81. The Big Energy Savings Network events are expected to reach at least 50,000 vulnerable consumers this winter. At these events, trained advisors will be able to make use of the machine readable images to facilitate increased switching.

82. The new licence conditions Ofgem has introduced to implement its RMR measures are expected to increase consumer engagement (see the 'Problem under consideration' section above for more details). However, due to the typically high level of disengagement (see figure 1 above) of vulnerable consumers, it is considered that the 50,000 consumers reached by the Big Energy Savings will receive additional benefits through the use of machine readable images at assisted action events, on top of any benefits received in the baseline scenario.

83. A report by Ofgem suggests that it is highly likely that these consumers have never switched before and so can be expected to achieve savings of around £162 per year[64] (2013 prices), the average saving for a consumer switching for the first time.[65] Switchers in this group of vulnerable people can be expected to reap these savings for at least one year. These savings constitute a reallocation of economic surplus from suppliers to consumers, representing a benefit for consumers.

Indirect benefits to 'passive' consumers

84. Approximately 20% to 30% of consumers in the energy market are "passive", according to Ofgem.[66] This means they have switched in the past but are currently unlikely to switch soon, given the current

[62] DECC (2013) 'Ensuring a better deal for energy consumers: Government Response to consultation on DECC's discussion document' [web], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/200051/gov_response_ensuring_better_deal_consumers.pdf

[63] Ofgem (2013) 'Consumer Vulnerability Strategy' [web], available at: https://www.ofgem.gov.uk/ofgem-publications/75550/consumer-vulnerability-strategy.pdf

[64] Ofgem (2012) 'The Retail Market Review – Draft Impact Assessment for the updated domestic proposals', p.36 [web], available at: https://www.ofgem.gov.uk/ofgem-publications/39459/retail-market-review-draft-impact-assessment-updated-domestic-proposals.pdf

[65] This is based on using the GDP deflator to express the Ofgem 2012 figure on real 2013 prices.

[66] Ofgem (2011) 'The Retail Market Review – Findings and Initial Proposals: Supplementary appendices' [web], available at: https://www.ofgem.gov.uk/ofgem-publications/39709/rmrappendices.pdf

tools available to consumers. These tools are in the process of being improved by the RMR.[67] However, it is considered that placing machine readable information on consumer's bills may be expected to raise their level of engagement and increase their switching rate compared to the baseline scenario. The number of these consumers which switch supplier can be expected to achieve savings of around £74 per year in 2013 prices, the average potential saving across all consumers.[68] These savings constitute a reallocation of economic surplus from suppliers to consumers, representing a benefit for consumers.

Potential 'deadweight loss' reduction benefits

85. According to Ofgem's latest National Report to the European Commission, the Herfindahl-Hirschman Index (HHI), a commonly used measure of competition, was 1,720 for the UK domestic retail electricity market and 2,373 for the UK domestic retail gas market in December 2012.[69] Under the Office of Fair Trading (OFT) definition, this means the domestic retail electricity market is 'concentrated' (has a HHI above 1000) and the domestic retail gas market is 'highly concentrated' (has a HHI above 1800).[70] In a perfectly competitive market the HHI would be just above zero, indicating that UK domestic retail energy markets are not perfectly competitive.

86. Theoretically, in a non-perfect market suppliers can price above marginal cost, which causes a 'deadweight loss' to society as customers consumer sub-optimally low quantities as a result of the price being above marginal cost (assuming demand is not infinitely inelastic). In such a market, an increase in competitive pressure would lead to a reduction in price resulting in an increase in demand from consumers and a reduction in 'deadweight loss', i.e. a net gain to society as a whole.

87. In the Great Britain (GB) energy market, domestic energy consumers' demand for energy is inelastic meaning that demand for it is not very responsive to price; it is a commodity that everyone needs.[71][72] This means that if an increase in competitive pressure were to lead to a reduction in price, the change in energy demand from consumers would be small, as would the net gain to society.

Possible further indirect benefits

88. Suppliers may choose to comply with the policy by optimising the consumers experience gained from a 'vanilla' reading, for example by generating URL web addresses which embed the consumers data.[73] These web pages could manipulate the data, for example to allow intra-supplier tariff comparisons, This could bring about additional benefits for consumers by encouraging consumers to switch to cheaper tariffs with their current supplier.

89. In addition, there is also a strong possibility that third parties, for example switching sites, will develop applications to utilise the data embedded in the machine readable formats.[74] Informal feedback so far suggests that switching companies are keen to develop applications to read the formats in order to offer

[67] Ofgem (2013) 'The Retail Market Review – Implementation of Simpler Tariff Choices and Clearer Information: Decision' [web], available at: https://www.ofgem.gov.uk/sites/default/files/docs/decisions/the_retail_market_review_-_implementation_of_simpler_tariff_choices_and_clearer_information.pdf

[68] Ofgem (2012) 'The Retail Market Review – Draft Impact Assessment for the updated domestic proposals', p.36 [web], available at: https://www.ofgem.gov.uk/ofgem-publications/39459/retail-market-review-draft-impact-assessment-updated-domestic-proposals.pdf

[69] Ofgem (2013) '2013 Great Britain and Northern Ireland National Reports to the European Commission', pp.60-1 (electricity) and p.112 (gas) [web], available at: https://www.ofgem.gov.uk/ofgem-publications/82755/2013greatbritainandnorthernirelandnationalreportstotheeuropeancommission.pdf

[70] OFT (2003) 'Mergers: Substantive assessment guidance', p.23 [web], available at: http://www.oft.gov.uk/shared_oft/business_leaflets/enterprise_act/oft516.pdf

[71] The price elasticity of demans measures the percentage change in demand for a one percent change in the price. A figure of between 0 and -1 mean that demand is price inelastic – for each percentage change in price, there's a lesser change in the quantity demanded. Studies put the long-run price elasticity of demand at between -0.32 and -0.81 for electricity and around -0.36 for gas. See Bernstein and Griffin (2005) 'Regional Differences in the Price-Elasticity of Demand for Energy' [web], available at: http://www.rand.org/pubs/technical_reports/2005/RAND_TR292.pdf.

[72] See also Espey, J.A. and Espey, M. (2004), 'Turning on the Lights: A Meta-Analysis of Residential Electricity Demand Elasticities' [web], available at: http://ageconsearch.umn.edu/bitstream/42897/2/Espey%20JAAE%20April%202004.pdf

[73] A 'vanilla' reading is the result of scanning the machine readable format with a common, freely available scanning application on smartphone or similar.

[74] BIS (2014) 'Feasibility study on the use of QR codes in the energy sector', p.17 [pdf], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/276198/bis-14-519-midata-programme-feasibility-study-on-use-of-qr-codes-in-energy-sector.pdf

tariff and usage changes. Through discussions with industry, one switching company estimated that the cost of developing such applications would be relatively low, at around £25k - £100k per operating system. It is considered that the development of such applications will raise levels of engagement and increase switching rates, compared to the baseline scenario in which Ofgems's new license conditions remain in force.This will reallocate economic surplus from producers to consumers, representing a benefit for consumers.

90. It has not been possible to monetise these benefits due to uncertainty about:
    - the degree to which the machine readable images and possible third party applications will bring about additional switching, on top the level which would be expected in the baseline scenario
    - the likelihood of third parties, for example switching sites, developing applications to utilise the machine readable formats
    - the current price and marginal cost structure of the retail energy market
    - the extent to which the policy will increase competitive pressure in the retail energy market

91. This option may additionally bring a range of wider non-monetised benefits. These include:

a.) Competition and innovation:
A consumer's increased access to their own data should empower them through the enhanced ability to search (overcoming imperfect information) and choose the right tariffs for them, which should serve to heighten competition between firms and improve the overall efficiency of resource use. The benefits in terms of increased switching are discussed in detail above, but there may be longer term benefits in terms of cost reduction and improved firm performance.

In the literature review, ICF/GHK note that, 'Enhanced decision-making by active consumers with the confidence to engage in markets can have a significant impact on the competitiveness of the economy, by acting as a driver for long term economic growth through intensifying competition and innovation (European Commission 2011 and OFT 2011).

Therefore, there is a clear theoretical link between consumer empowerment and competition (and ultimately economic growth). However, largely due to the difficulty of identifying outcomes and the relative novelty of the Midata concept, there is little in the way of quantitative evidence to estimate the extent to which Midata directly contributes to consumer empowerment and the growth impact of empowerment.

b.) New and expanding use of third party intermediaries
The internet has opened up new markets for providing information to consumers. A survey by the OFT in 2009[75] estimated that 60% of internet shoppers used a price comparison site to find/search for goods or services to buy online and, of those, the proportion that used more than one price comparison site was 71%.

If consumer can access their own data more easily, then potentially a broader range of services could become available to consumers based on the newly available type of information. For example, tariff comparison applications were discussed in detail above. However, other services could be also developed, for instance applications to use the data to provide advice on potential savings from energy efficiency measures.

c.) Changes in consumption patterns:
As well as helping consumers compare tariffs, consumers being able to access their own data easily is expected to help them analyse their consumption and drive improvements to their spending patterns and lifestyle. Particularly with application to energy markets, easier access to data could encourage consumers to make choices which minimise the financial and carbon burdens of their consumption. The Midata project working group highlighted the potential for applications which read the machine readable images to encourage energy consumers to think about usage. For example, energy 'gamification' could play a key role in future applications.

[75] OFT (2009) 'Findings from consumers surveys on Internet Shopping: A comparison of pre and post study consumer research' [web], available at: http://www.oft.gov.uk/shared_oft/reports/Evaluating-OFTs-work/oft1079.pdf

Break even analysis

92. Although, as discussed in the 'Non-monetised benefits' section above, it has not been possible to monetise any of the benefits of this policy, a break even analysis is presented here. This essentially indicates the increased level of switching that would need to result from the polict, so the gain in consumer welfare fully offset the costs of the policy (please see table 3 below for details):

93. As discussed in the 'Non-monetised benefits' section above, on average consumers can be expected to achieve annual savings of around £74 per year (2013 prices). If just under 16,000 consumers, who have never switched before, switched supplier in 2014 as a result of this policy then this would fully offset the net present value of the costs of the policy.

Risks and Sensitivities

Risk of Options

94. There is a risk that any particular machine readable format, unilaterally adopted by a supplier, becomes an obsolete technology. If fewer consumers choose to use a particular format in order to access their own data, then the potential benefits of the policy will be reduced. There are numerous examples in recent history of technologies which have become obsolete, rendering the associated data formats less useful, for example High-Definition DVDs and MiniDisc. Option 1 mitigates this risk by allowing for freedom of innovation by suppliers in the way in which they comply with the legislation, rather than prescribing a particular type of machine readable format.

Assumptions

95. There are a number of assumptions made in the calculations of the costs and benefits to each Option, as discussed above (see Box 3). We will be consulting on the assumptions used in IA. Although improved data sources could increase the accuracy of these assumptions, as seen in the 'Break even analysis' section above, only small changes in consumer behaviour are required to vastly outweigh the costs of the policy.

96. All assumptions and cost estimates will be tested as part of the consultation and if necessary revised in the final impact assessment.

Box 3: Summary of assumptions

- The appropriate discount rate for future costs and benefits is 3.5% per year
- The policy is appraised over a period of 10 years, up until the end of 2023, but costs and benefits are assumed to be zero beyond the sunset data
- For each energy supplier, two systems designers will be requires to work for one week in order to redesign the bill generation processes
- For each energy supplier, two systems designers will be required to work for one week in order to redesign the bill printing processes
- For each energy supplier, two graphic designers will be required to work for one week in order to redesign the bill
- Half as much ink is requires to print a QR code compared to an alternative machine readable format

Small and micro business assessment

97. The costs of this policy will be borne entirely by energy suppliers, some of whom are small or micro business according to the Better Regulation definition, which defines them as having up to 49 full time employees.[76] Additionally, some of the indirect benefits of switching to a cheaper energy tariff as a result of this policy may accrue to small businesses who fall into the domestic sector of the retail energy marke

[76] BIS (2013) 'Better Regulation Framework Manaual: Practical Guidance for UK Government Officials', pp.26-7 [web], available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/211981/bis-13-1038-better-regulation-framework-manual-guidance-for-officials.pdf

98. There will be no exemptions from this regulation for small and micro busnisses. Machine readable formats have the portential to benefit all consumers and this should be realised regardless of the size of supplier they are with. This is a measure to help consumers better engage with the domestic retail energy market and to facilitate cross market comparisons and should not be restricted to any portion of the market.

99. As outlined in the 'Monetised Costs' section above, the costs of complying with this policy are relatively small. The NPV of the one-off costs for each firm is expected to be around £5,400. The recurring annual costs are just the costs of printing the machine readable images, which depends on the number of paper bills the supplier issues each year.

One-in, two-out

100. This policy respresents an IN of £0.5m per year.