



Department
of Energy &
Climate Change

Implementing the Energy Efficiency Directive as it applies to the metering and billing of heating and cooling

Helping UK consumers better understand and manage their consumption when supplied by district heating, district cooling and communal heating and/or hot water

URN: 13D/314

January 2014



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The consultation and Impact Assessment can be found on DECC's website: www.gov.uk/decc

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General information

Purpose of this consultation

This consultation document seeks views on the Government's approach to implementation of Articles 9, 10, 11 and 13 of the EU Energy Efficiency Directive, as they apply to district heating, district cooling and communal heating and/or hot water.

Issued: 10 January 2014

Respond by: 21 February 2014

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Consultation reference: URN 13D/314

Territorial extent:

The consultation covers England, Wales, Scotland and Northern Ireland.

How to respond:

Your response will be most useful if it is framed in direct response to the questions posed, though further comments and evidence are also welcome.

Electronically submitted responses would be preferred. A template for responding has been published alongside this consultation.

Email address: heatstrategy@decc.gsi.gov.uk

Additional copies:

You may make copies of this document without seeking permission. An electronic version can be found at https://www.gov.uk/government/publications?departments%5B%5D=department-of-energy-climate-change&publication_filter_option=consultation

Other versions of the document in Braille, large print or audio-cassette are available on request. This includes a Welsh version. Please contact us under the above details to request alternative versions.

Confidentiality and data protection:

Information provided in response to this consultation, including personal information, may be subject to publication or disclosure in accordance with the access to information legislation (primarily the Freedom of Information Act 2000, the Data Protection Act 1998 and the Environmental Information Regulations 2004).

If you want information that you provide to be treated as confidential please say so clearly in writing when you send your response to the consultation. It would be helpful if you could explain to us why you regard the information you have provided as confidential. If we receive a request for disclosure of the information we will take full account of your explanation, but we cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded by us as a confidentiality request.

We will summarise all responses and place this summary on our website at https://www.gov.uk/government/publications?departments%5B%5D=department-of-energy-climate-change&publication_filter_option=consultation . This summary will include a list of names or organisations that responded but not people's personal names, addresses or other contact details.

Quality assurance:

This consultation has been carried out in accordance with the Government's Code of Practice on consultation, which can be found here:

<http://www.bis.gov.uk/files/file47158.pdf>

If you have any complaints about the consultation process (as opposed to comments about the issues which are the subject of the consultation) please address them to:

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Executive Summary

This consultation document seeks views on the Government's approach to implementing the heat metering and billing articles of the EU Energy Efficiency Directive, which was agreed by Member States on 25 October 2012 and came into force on 14 November 2012.

Background

The Energy Efficiency Directive

1. This consultation seeks comments on the implementation in the United Kingdom of the metering and billing requirements of the EU Energy Efficiency Directive (as they apply to heating and cooling). The new Energy Efficiency Directive ("the Directive") establishes a common framework of measures for the promotion of energy efficiency within the EU in order to ensure the achievement of the EU's 2020 20 % headline target on energy efficiency and to pave the way for further energy efficiency improvements beyond that date.
2. This consultation focuses on the requirements on the metering and billing of district heating, district cooling, communal heating and/or hot water (as they apply to Article 9.1 and 9.3 and Articles 10 and 11), and on penalties (as applied to the heat elements of Articles 9-11).
3. The Directive repeals the Energy Services Directive (2006/32/EC), amongst others. In that Directive, Article 13 on 'Metering and informative billing of energy consumption' included general requirements for the metering of final consumption.
4. The Government's assessment at the time was that it was not cost-effective to install heat meters. The Energy Efficiency Directive builds on the Energy Services Directive and focusses in particular on multi-apartment/ multi-purpose buildings. The requirements on billing information are also strengthened and extended.
5. Following this consultation, the Government will analyse consultation responses and then develop secondary legislation to implement the Directive's requirements. The Government will develop guidance on the requirements that involve tests of technical feasibility and cost-efficiency to support organisations in carrying out the necessary assessments.

Guiding principles for implementation

6. The Government's guiding principles for implementation are to:
 - Give heating, cooling and hot water customers greater control over their consumption, and consequently costs and billing. Meters provide a direct financial incentive to reduce demand, increase awareness of energy use and a more equitable allocation of costs between customers.

- Enable heat network operators to gather information on heat losses and allows better management of systems. This will save energy, as well as reducing carbon emissions and improving security of supply.
- Ensure the requirements are fully cascaded and advice provided to support implementation, with the ambition to provide greater efficiency and transparency for heat networks customers.
- Ensure consistency with the Government's overall approach to energy efficiency and fuel poverty.
- Ensure that a proportionate approach to implementation is taken, minimising the administrative burden placed on UK business.
- Deepen our knowledge of the extent of heat networks at all scales, to support a range of practical measures being developed to support the sector such as an industry-led consumer protection scheme and work on harmonising technical standards. This consultation is also being supported through additional evidence gathering initiatives.
- Support the overall development and expansion of the heat networks sector in the UK.

What are the requirements of the Directive on metering and billing?

7. Articles 9, 10 and 11 focus on the metering, billing information and the cost of access to metering and billing information. This consultation deals with these requirements as they affect the metering and billing of district heating, district cooling, communal heating and/or hot water.
8. **On metering: Article 9** makes a number of requirements on the metering of district heating, district cooling, communal heating and/or hot water, both to measure individual consumption and consumption at the building-level in multi-apartment/multi-purpose buildings. Some of the requirements are dependent on tests of technical feasibility and cost-efficiency. However, in three instances the requirement is not conditional on such tests. The three are where:
 - (i) a new connection is made in a new building;
 - (ii) where a building undergoes major renovation; and
 - (iii) at the point of delivery or heat exchange to buildings of multi-apartment or multi-purpose use.
9. **On billing information and on the cost of access to metering and billing information (Articles 10 and 11).** These Articles make a number of requirements on billing information and the cost of access to metering and billing information. A number of the requirements on billing information relate only to those heat network customers with heat meters, and/or apply conditions of technical feasibility, cost-effectiveness or appropriateness. Article 11 requires suppliers or other organisations to bear the costs of producing and delivering bills and billing information to final customers. The impacts of these requirements are less certain, though

electronic metered billing is the industry norm in new developments, where metering systems are retrofitted and where existing meters are replaced.

Timetable for implementation

10. The overall deadline for transposition of the requirements of the Directive is 5 June 2014. These requirements come into force from this date. The requirement for completion of an assessment and/or installation of individual heat meters of heat cost allocators in multi-apartment/multi-purpose buildings is given a deadline of 31 December 2016 in the Directive.
11. In the Directive, requirements on billing information and on the costs of billing information apply across all final energy consumption, including heating and cooling. Article 10 requires Member States to ensure that, by 31 December 2014, billing information is accurate and based on actual consumption, where it is technically possible and economically justified.

Timetable for implementation

Directive comes into force in the UK	5 June 2014
Accurate billing information (where technically possible and economically justified)	31 December 2014
Deadline for implementation for multi-apartment/multi-occupancy buildings	31 December 2016

Fit with policy landscape

12. The Government has identified heat networks as having an important role to play in the transition to low carbon heating. Heat makes up around half of the final energy consumption in the UK and contributes around a third of the UK's greenhouse gas emissions.
13. The Government is supporting the deployment of heat networks (district heating) in a number of actions set out in the March 2013 publication: "The Future of heating: Meeting the challenge". <https://www.gov.uk/government/publications/the-future-of-heating-meeting-the-challenge>.
14. For example, a new Heat Networks Delivery Unit has been established to provide specialist expertise to assist Local Authorities to develop heat network plans to the point where they are feasible investment propositions. In Scotland, heat policy is devolved and the Scottish Government will publish its draft Heat Generation Policy Statement for consultation in the New Year. The Scottish Government has set out its support for district heating in its District Heating Action Plan, published in May 2013¹

¹ [District Heating Action Plan; Response To The Expert Commission On District Heating](#)

15. Heat networks supply heat to a number of buildings or dwellings from a central heat production facility (or facilities) through an insulated pipe system, which is in general underground. Heat networks can be both lower carbon and cheaper for consumers than a building-level heat solution. The amount of heat supplied to buildings in the UK via heat networks is around 2% of domestic, public sector and commercial heat demand.²
16. New private sector developments and new local authority-led heat network schemes tend to have heat meters installed as standard and charge on the basis of heat usage by individual properties. However in older schemes, customers are typically billed for a fixed proportion of the total heat generated.

Benefits of heat metering

17. Where meters are installed, with greater control and transparency of consumption and charging, they allow consumers to:
- Decide when to use their heating (and cooling) systems and at what temperature to heat their homes (and businesses);
 - Have greater control over the energy they use and the amount that they pay;
 - See accurately what energy they use and to encourage consumers to identify and reduce wasteful consumption;
 - Avoid the subsidisation of abnormally high usage by lower energy consumers. For example, in multi-apartment buildings, where flat-rate charges can distort individual heat consumption variances. Though there are important considerations on the impacts on vulnerable consumers.

On a system-wide basis:

- Building-level meters will help to highlight the heat provided to a building as a whole, and those heat distribution networks that are poorly performing at a system-wide level. This will enable heat network operators to identify system efficiencies and losses and help to analyse the value of potential energy saving interventions.

Heat metering and billing: extent and impacts

18. A BRE study³ commissioned by DECC concluded that it was difficult to say how many dwellings are served by heat meters. Responses from the heat networks survey work undertaken by Databuild suggested that approximately 25% of existing residential-led heat networks schemes have heat meters installed. The charging mechanisms for the remaining 75% are based upon apportionment or points based system. This survey and a review of

² https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/190149/16_04-DECC-The_Future_of_Heating_Accessible-10.pdf Page 39

³ [Heat metering cost-benefit analysis - Publications - GOV.UK](#)

recent case studies demonstrated that heat metering is being installed in new developments, particularly in the housing sector. An earlier study in 2007⁴ indicated that 77% of dwellings in the social housing sector connected to a heat network did not have heat meters.

19. The Government does not have information on the extent of district cooling or communal heating and/or hot water systems or the extent of the metering of these technologies.
20. The Impact Assessment that accompanies this consultation document focuses on the least cost way of implementing the requirements of the Directive and then the costs and benefits of any additional elements that could improve the net benefit to the UK, in line with better regulation principles. Based on existing limited data, our analysis of the cost-effectiveness of meters suggests that there are no properties are likely to be cost-effective for individual consumption meters, based on the assumptions used. However, there is uncertainty around the costs and benefits surrounding the metering of heat networks. The costs and benefits presented in the Impact Assessment require a number of assumptions to be made to address a lack of evidence. These assumptions can significantly alter the costs and benefits of the options and the Impact Assessment provides sensitivity analysis to illustrate the uncertainty and impact of costs. The Government is seeking to address these uncertainties through this consultation and further evidence gathering.

Policy options

21. The heat networks sector as a whole is not regulated in the same way as the gas and electricity markets. An analysis of existing policies has concluded that they do not adequately meet the UK's legal obligation under the Directive.

Policy approach and options

22. The Government is consulting on six different policy approaches. All of the options would require the lead action on implementation to rest primarily with heat network operators (HNOs). HNOs would be required to implement the metering and billing requirements of the Directive. This would involve all owners of such schemes with responsibility for heat networks schemes and heat supply. The variation in the options follows two broad themes:
- on responsibility and support for the **application of cost effectiveness and technical feasibility tests** where these conditions apply to meter installation. The options considered cover either where an assessment of every individual unit is required or where a high-level system-wide sift would be used to identify those properties that would then require unit level assessment. This in turn links to the requirements on notification.
 - on **notification, monitoring and enforcement**. The first option proposes detailed unit by unit data reporting to the scheme administrator the result of which would mean the scheme administrator would only use a small sample to survey or inspect for compliance. The other option would not require detailed reporting, thereby reducing the burden on

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<http://www.chpa.co.uk/medialibrary/2011/05/18/241aec2/DEFRA%20heat%20metering%202007%20inc%20DH%20survey.pdf>

HNOs. Instead this would rely on the scheme administrator using a larger sample to survey and inspect for compliance.

23. The document considers using the Building Regulations under the Building Act 1985 to implement all or part of the metering requirements. However, building regulations are not a direct way of regulating the on-going activities of heat network operators; private sector approved inspectors, who carry out about half the building control work in England, have no enforcement powers; and building regulations requirements are now fully devolved, so that any implementation in building regulations relating to England alone would have to be accompanied by equivalent legislation in the Devolved Administrations, which would not be achievable within the transposition timetable.

Routes to implementation

24. Using the least cost implementation route identified through the Impact Assessment, it is anticipated that the steps for metering and billing implementation would include the following core elements:

- Each heat network operator will need to ensure their heat networks scheme database and extent of metering currently is understood and recorded – both at building and individual apartment or business unit level. A similar approach will be needed to establish the status of billing information and costs.
- The mandatory requirements for meter installation and billing information will need to be implemented.
- The Government will provide central guidance to enable HNOs to undertake tests of technical feasibility and cost-effectiveness where these apply. The details of the guidance will be developed ahead of the transposition deadline of 5 June 2014.

25. For the metering requirements, the actual assessment would consist of two stages.

- (i) An initial stage where a HNO will assess whether a heat meter is deemed to be cost-effective based on the Government's guidance which will allow a desk-study of the types of properties on a network, using criteria such as on heat demand, insulation-levels, etc.
- (ii) For those units where it is deemed to be cost-effective, a second stage would involve a site visit by an engineer to confirm that a meter or heat cost allocator would be technically feasible. This may involve checking that there is sufficient space and access to pipework to install a meter. The site visit would also allow the heat network operator to collect information which may adjust the cost-effectiveness calculation, for instance confirming that there are heating controls installed.

Scheme administration

26. The scheme administrator will have several key regulatory responsibilities in administering the heat metering requirements of the Directive. The Government envisages that these will include:

- Undertaking, or commissioning through a third party, a system of monitoring of scheme notification and monitoring for compliance, including through sample survey and site visits;
- Responsibility for the central guidance on technical feasibility and cost-effectiveness, though the Government will be responsible for commissioning the first template for this guidance before transposition;
- Responsibility for scheme enforcement.

27. We have identified two possible organisations who may be well placed to take on the role of the scheme administrator:

- The **National Measurement Office**, which has a UK-wide remit; or
- Through an extension to the remit of the **Heat Networks Delivery Unit**, DECC in England and Wales.

28. The National Measurement Office (NMO) is an Executive Agency of the Department of Business and Skills (BIS) and is responsible for ensuring fair and accurate measurements are available and used for transactions regulated by law, enforcement of a range of technical and environmental regulations and maintaining the science base for measurement in the UK.

29. The NMO is also responsible for approving gas and electricity meters used for the purposes of billing and some market surveillance responsibilities for the accuracy of meters in the field.

30. As a UK-wide administrator and enforcement body, NMO is responsible for enforcing a range of technically complex pieces of environmental and measurement based legislation. NMO operates as a modern risk-based, business-focused authority. It aims to minimise burdens on compliant business while using a range of enforcement tools to target identified infringements.

31. The Heat Networks Delivery Unit, an extension of the Heat and Industry Directorate in DECC, is tasked with working with local authorities to support the deployment of heat networks. The Unit is staffed with engineering, financial and commercial experts with extensive knowledge of the heat networks sector.

32. Given the similarities with its existing metering work and enforcement powers, the Government considers that the NMO should be the preferred scheme administrator.

Consultation timeline, stakeholder engagement and additional evidence gathering

33. The Government is running the consultation for 6 weeks. To support this consultation period a number of events will be run across the UK to explain what the Directive requirements mean, the Government's approach to implementation, and to gather further evidence.

34. The Government is also commissioning a survey of 500 district heating schemes of varying sizes to improve the overall evidence base. This will include the extent of metering on those networks.

Catalogue of consultation questions

Extent of heat metering	
Q 1	DECC is undertaking further evidence gathering on the extent of heat networks and heat metering. In addition to this work, do you have information about smaller heat networks and the extent of metering, including in the non-domestic sector?
Q 2	Do you have information about the extent of metering of cooling or communal heating, including communal hot water in the UK?
Q 3	<p>The European Commission's guidance is that meters must comply with the Measuring Implements Directive (MID) and heat cost allocators (HCAs) must comply with the relevant European Standards (EN 834 and EN 835).</p> <p>What steps should the Government take to ensure the accuracy of meters and HCAs at the point of installation and on their on-going accuracy?</p>

Heat metering cost estimates	
Q 4	Do you agree with the cost estimates for heat meters? Y / N (Please provide supporting evidence)
Q 5	Would the costs of building-level meters serving, communal heating or district cooling be significantly different to the cost of individual consumption meters? Y / N (Please provide supporting evidence or reasoning)
Q 6	Are there any issues when considering replacing one meter with another? Are they necessarily compatible? Y / N (Please provide supporting evidence)

Heat cost allocators	
Q 7	Do you have evidence of the overall cost of HCAs – including calibration, installation and maintenance, and when combined with TRV installation?

Q 8	How is hot water consumption measured where HCAs are used and what are the associated costs?
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Heat meter installation

Q 9	Our assumption is that heat metering is not feasible where installation would require changing the in-house piping for hot water heating in the building – do you agree? Y / N (Please provide supporting evidence)
Q 10	Are there other technical or cost considerations that apply to the installation of building-level meters or in metering cooling?
Q 11	Do you have evidence of who currently installs heat meters in existing heat networks – and any qualifications or experience that are required?

Transition from flat-rate charging

Q 12	Do you agree the Government should <u>not</u> seek to mandate the introduction of transparent rules on the allocation of costs? Y / N (Please give reasoning)
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Billing information

Q 13	As a heat supplier do you offer electronic billing (or if you are a customer do you receive or have the option of electronic billing)? Y / N What are the costs of introducing electronic billing?
Q 14	Should the Government make the requirement 10.3 (d) mandatory (that, at the request of the final customer, the information contained in these bills shall not be considered to constitute a request for payment. In such cases, Member States shall ensure that suppliers of energy sources offer flexible arrangements for actual payments) Y/N (Please give reasoning)
Q 15	Where an individual heat meter is provided, is that consumer always billed on the basis of actual consumption? Y / N

	<p>If YES - please provide further information</p> <p>If NO - what are the technical or economic arguments against billing in this way?</p>
Q 16	How should the like-for-like comparison of deals in 10.3 (e) be applied?

Costs of billing

Q 17	What are the cost implications of meeting the requirements of Article 11 for heat or cooling network operators or for communal heating schemes?
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Options for implementation

Q 18	Which of the options presented, or combination of, do you think would best meet the requirements, and why? What alternative approaches might there be?
Q 19	How best do you think the automatic requirement for the installations of an individual heat meter following a 'major renovation' should be triggered – through building control officers (where this definition applies in the building regulations) or by placing an obligation on heat network operators to ensure building owners are made aware of this requirement?
Q 20	Are there any particular issues that should be taken into account for the Devolved Administrations?

Steps for implementation of metering requirements

Q 21	The RHI heat metering guidance has been consulted on through the Microgeneration Certification Scheme (MCS). Do you have views on whether and, if so, how similar guidance may need to be tailored for the metering of heat networks?
Q 22	Do you have evidence or views of how the tests of cost effectiveness and technical feasibility should be applied?
Q 23	Do you agree that the assessment of technical feasibility and cost-efficiency should be undertaken on a 4-yearly basis to reflect real world changes? Y/N

If NO, can you explain what would be a more appropriate gap, with reasoning?

Steps for implementation of billing requirements

Q 24 How would it be best to monitor compliance with the billing information (Article 10) and cost of access to metering and billing information (Article 11) requirements?

Q 25 What approach should be taken where some consumers want to sign up to electronic billing while others do not? What are the tipping points in establishing such a mechanism in multi-apartment/multi-purpose buildings?

Fuel poverty

Q 26 Do you have evidence of the impact of heat metering/heat cost allocators on the fuel poor, or how the transition to metered charging has been managed?

Q 27 If you do not currently meter heat in multiple-apartment/multi-purpose buildings, particularly social housing, can you provide evidence of the impact the introduction of heat metering would have?

Consumer behaviour

Q 28 Do you have further evidence of the impact of heat metering/HCAs on consumer behaviour and the resulting impacts on heat consumption?

Scheme administration

Q 29 Who do you think should be appointed as the scheme administrator?

- a. The National Measurement Office
- b. DECC, through the HNDU in England and Wales
- d. Other options, particularly for Northern Ireland and Scotland (and if so, who)?

	Please give reasoning.
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Sanctions

- | | |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q 30 | <p>Do you agree that these sanctions provide appropriate routes to address non-compliance and that these should address the following misdemeanours?</p> <ul style="list-style-type: none"> a. Failure to notify or respond to the enforcing authority. b. Failure to carry out a feasibility test or to install a heat meter or heat cost allocator where required. c. Failure to provide evidence of actions taken when requested by the enforcing authority, or providing misleading information. d. Failure to ensure accurate bills and billing information based on actual consumption are provided, where heat meters or heat cost allocators are installed. e. Refusing to allow the enforcement body access to premises, where access is reasonable (e.g. in order to check the installation of a heat meter or the application of a technical feasibility/cost-efficiency test) <p>Yes / No / Any other comments on our proposed approach to enforcement</p> |
| Q 31 | <p>What burden of proof should the enforcing authority apply when assessing whether an offence has been committed - beyond reasonable doubt or a balance of probabilities test or something else? Please give reasoning.</p> |

Appeals

- | | |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q 32 | <p>Do you consider that the First-tier Tribunal is the appropriate body to hear and determine appeals against decisions to issue a civil penalty for failure to provide relevant information? Y / N</p> <p>If NO, please provide reasoning.</p> |
| Q 33 | <p>Do you consider that the General Regulatory Chamber Rules of the First-tier Tribunal will suit the handling of these appeals against decisions by the Secretary of State? If not, why not?</p> <p>(The General Regulatory Chamber Rules may be found at:
 http://www.justice.gov.uk/guidance/courts-and-tribunals/tribunals/rules.htm)</p> |

Other issues you may want to raise

Q 34 Are there any other issues you wish to raise in relation to the requirements on metering and billing that have not been covered in other consultation questions?

Glossary of acronyms and abbreviations

DCLG	Department for Communities and Local Government
NMO	National Measurement Office
HNO	Heat network operator
CHP	Combined heat and power
BRE	Buildings Research Establishment
'The Directive'	EU Energy Efficiency Directive
HCA	Heat cost allocator
HNDU	Heat Networks Delivery Unit
BIS	Department for Business, Innovation and Skills
FtT	First-tier Tribunal

1. Introduction

This chapter sets out the purpose of the Energy Efficiency Directive, the guiding principles that support the Government's implementation of the heat metering and billing elements of the Directive, the timetable for implementation and the extension of the requirements to the Devolved administrations.

The Energy Efficiency Directive

- 1.1 This consultation seeks views and comments on the implementation in the United Kingdom of the heat and cooling metering and billing requirements of Directive 2012/27/EU of the European Parliament and of the Council on energy efficiency (the Energy Efficiency Directive or the Directive). The Directive was published in the Official Journal of the European Union on 14 November 2012 and entered into force 20 days later, on 04 December 2012. The Directive can be accessed at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:315:0001:0056:EN:PDF>
- 1.2 The new Energy Efficiency Directive establishes a common framework of measures for the promotion of energy efficiency within the EU in order to ensure the achievement of the EU's 2020 20 % headline target on energy efficiency and to pave the way for further energy efficiency improvements beyond that date. It lays down rules designed to remove barriers in the energy market and overcome market failures that impede efficiency in the supply and use of energy, and provides for the establishment of indicative national energy efficiency targets for 2020.
- 1.3 This consultation focuses on the requirements for heat and cooling metering (as they apply to Article 9.1 and 9.3), on heat billing (as they apply to Articles 10 and 11), and on penalties (as applied to the heat elements of Articles 9-11).
- 1.4 The Directive repeals the Energy Services Directive (2006/32/EC), amongst others. In that Directive, Article 13 on 'Metering and informative billing of energy consumption' included general requirements for the metering of final consumption. The Government's assessment at the time was that it was not cost-effective to install heat meters.
- 1.5 The Energy Efficiency Directive builds on the Energy Services Directive and focusses in particular on multi-apartment/ multi-purpose buildings. The requirements on billing information are also strengthened and extended.

Guiding principles for implementation

- 1.6 This consultation seeks views on how the UK should implement the heat metering and billing requirements in the Directive as they apply to heating, district cooling and hot water. The Government's guiding principles for implementation are to:
 - Give heating, cooling and hot water customers greater control over their consumption, and consequently costs and billing. Meters provide a direct financial incentive to reduce

demand, increase awareness of energy use and a more equitable allocation of costs between customers.

- Enable heat network operators to gather information on heat losses and allows better management of systems. This will save energy, as well as reducing carbon emissions and improving security of supply.
- Ensure the requirements are fully cascaded and advice provided to support implementation, with the ambition to provide greater efficiency and transparency for heat networks customers.
- Ensure consistency with the Government's overall approach to energy efficiency and fuel poverty.
- Ensure that a proportionate approach to implementation is taken, minimising the administrative burden placed on UK business.
- Deepen our knowledge of the extent of heat networks at all scales, to support a range of practical measures being developed to support the sector such as an industry –led consumer protection scheme and work on harmonising technical standards. This consultation is also being supported through additional evidence gathering initiatives.
- Support the overall development and expansion of the heat networks sector in the UK.

Timetable for implementation

1.7 The overall deadline for transposition of the requirements of the Directive is 5 June 2014. These requirements come into force from this date. The requirement for completion of an assessment and/or installation of individual heat meters of heat cost allocators in multi-apartment/multi-purpose buildings is given a deadline of 31 December 2016 in the Directive (Article 9.3).

1.8 Article 10.1 requires Member States to ensure that, by 31 December 2014, billing information is accurate and based on actual consumption, where it is technically possible and economically justified.

Table on implementation deadlines

Directive comes into force in the UK	5 June 2014
Accurate billing information (where technically possible and economically justified)	31 December 2014
Deadline for implementation for multi-apartment/multi-occupancy buildings	31 December 2016

1.9 For this consultation, the term 'heat network operator' is used as to cover those organisations responsible for the operation and management of the heat network and the supply of heat to the end consumer. In this context any modification to the heat network to meet the requirements of the Directive are expected to fall to the 'heat network operator'.

This will range from private energy services companies (ESCOs) to local councils.

- 1.10 Although much of the text in this consultation refers to heat meters on heat networks, it should be assumed that similar issues will arise in the case of district cooling, and communal heating (including the central provision of hot water). We would encourage comments on these aspects wherever questions are asked or evidence presented on heat networks. We have very limited evidence on the extent of these technologies across the UK.
- 1.11 The Government will run a consultation for 6 weeks. To support this consultation period a number of events will be run across the UK to explain what the Directive requirements mean, the Government's approach to implementation, and to gather further evidence.

Devolution and territorial extent

- 1.12 The Directive applies UK-wide and requires UK-wide compliance. Some areas covered by the Directive are devolved, particularly on heat policy and district heating, the promotion of energy efficiency and buildings standards. However, the broad requirements of the Directive and the consistency of policy on heat networks suggest that there is a good case for consulting on a UK-wide basis.
- 1.13 A consistent approach across the UK would be likely to simplify the administrative requirements and compliance costs for those participating in the scheme, creating a 'level playing field' across the UK and ensuring a more straightforward approach for those businesses which operate throughout the UK.
- 1.14 This consultation has been developed with the Devolved Administrations in Scotland, Wales and Northern Ireland, and applies on a UK-wide basis. In places, specific issues and questions as these relate to the Devolved Administrations have been included in this consultation.

2. The wider policy landscape

This chapter covers how heat metering fits within the Government's overall heat networks strategy and policy, and the benefits of metering.

Overall policy on low carbon heating and energy efficiency

- 2.1 The Government has identified heat networks as having an important role to play in the transition to low carbon heating. Heat makes up around half of the energy consumption in the UK and contributes around a third of the UK's greenhouse gas emissions. Heating within the domestic sector accounts for approximately 85% of UK domestic energy use (2012), and heating within the domestic sector accounts for around 27% of UK total energy use (2012).
- 2.2 The Government is supporting the deployment of district heating in a number of actions set out in the March 2013 publication: "The Future of heating: Meeting the challenge". <https://www.gov.uk/government/publications/the-future-of-heating-meeting-the-challenge>.
- 2.3 For example, the Government has established a new Heat Networks Delivery Unit to provide specialist expertise to assist Local Authorities to develop district heating plans to the point where they are feasible investment propositions. As well as practical assistance, the Unit is also administering a funding stream to support Local Authorities' plans.
- 2.4 In Scotland, heat policy is devolved and the Scottish Government will publish its draft Heat Generation Policy Statement for consultation in early 2014. The Scottish Government has set out its support for district heating in its District Heating Action Plan, published in May 2013. Key actions include the creation of the Heat Network Partnership to provide support to local authorities, businesses and communities in Scotland to develop district heating and carrying out a National Heat Mapping Programme for Scotland to underpin strategic development of heat networks.
- 2.5 Heat networks supply heat to a number of buildings or dwellings from a central heat production facility (or facilities) through an insulated pipe system, which is in general underground. Heat networks can be both lower carbon and cheaper for consumers than a building-level heat solution. The amount of heat supplied to buildings in the UK via heat networks is around 2% of domestic, public sector and commercial heat demand.
- 2.6 In the UK and across Europe, heat networks were first used in urban areas and predominantly in blocks of flats. They became popular in the UK for new developments of this type during the 1960s and 1970s. Many of the schemes in operation today in the UK originate from this period.
- 2.7 Central heating and hot water provided from a heat network can be controlled in the same way as with individual gas boilers, with meters and radiator valves. In the main, new private sector developments and new local authority-led schemes have heat meters installed as standard and charge on the basis of heat usage by individual properties. However, in older

schemes, customers are typically billed for a fixed proportion of the total heat generated. The lack of individual heat meters in some older schemes leads to limited control over the temperature and amount of heat consumed. ‘Smarter’ heat meters can be read remotely and can provide customers with real-time information on their heat use. Smart heat meters can be switched from pre-pay arrangements to instalment-based payments, providing customers with greater flexibility over billing.

Benefits of heat metering

2.8 Where meters are installed, with greater control and transparency of consumption and charging, they allow consumers to:

- Decide when to use their heating (and cooling) systems and at what temperature to heat their homes (and businesses);
- Have greater control over the energy they use and the amount that they pay;
- See accurately what energy they use and to encourage consumers to identify and reduce wasteful consumption;
- Avoid the subsidisation of abnormally high usage by lower energy consumers. For example, in multi-apartment buildings, where flat-rate charges can distort individual heat consumption variances. Though there are important considerations on the impacts for vulnerable consumers (see fuel poverty section below).

On a system-wide basis:

- Building-level meters will help to highlight the heat provided to a building as a whole, and those heat distribution networks that are poorly performing as an overall system. This will enable heat network operators to identify system efficiencies and losses and help to analyse the value of potential energy saving interventions.

3. Metering

This chapter sets out the heat metering requirements of the Directive, sets out what the Government understands is the current deployment of heat meters, and provides information about the costs and the technical challenges of meter installation.

Directive requirements on heat metering

Article 9 Metering (as it applies to heating, cooling and hot water)

1. Member States shall ensure that, in so far as it is technically possible, financially reasonable and proportionate in relation to the potential energy savings, final customers for electricity, natural gas, district heating, district cooling and domestic hot water are provided with competitively priced individual meters that accurately reflect the final customer's actual energy consumption and that provide information on actual time of use.

Such a competitively priced individual meter shall always be provided when:

- (a) an existing meter is replaced, unless this is technically impossible or not cost-effective in relation to the estimated potential savings in the long term;
- (b) a new connection is made in a new building or a building undergoes major renovations, as set out in Directive 2010/31/EU.

3. Where heating and cooling or hot water are supplied to a building from a district heating network or from a central source servicing multiple buildings, a heat or hot water meter shall be installed at the heating exchanger or point of delivery.

In multi-apartment and multi-purpose buildings with a central heating/cooling source or supplied from a district heating network or from a central source serving multiple buildings, individual consumption meters shall also be installed by 31 December 2016 to measure the consumption of heat or cooling or hot water for each unit where technically feasible and cost-efficient. Where the use of individual meters is not technically feasible or not cost-efficient, to measure heating, individual heat cost allocators shall be used for measuring heat consumption at each radiator, unless it is shown by the Member State in question that the installation of such heat cost allocators would not be cost-efficient. In those cases, alternative cost-efficient methods of heat consumption measurement may be considered.

Where multi-apartment buildings are supplied from district heating or cooling, or where own common heating or cooling systems for such buildings are prevalent, Member States may introduce transparent rules on the allocation of the cost of thermal or hot water consumption in such buildings to ensure transparency and accuracy of accounting for individual consumption. Where appropriate, such rules shall include guidelines on the way to allocate costs for heat and/or hot water that is used as follows:

- (a) hot water for domestic needs;
- (b) heat radiated from the building installation and for the purpose of heating the common areas (where staircases and corridors are equipped with radiators);
- (c) for the purpose of heating apartments

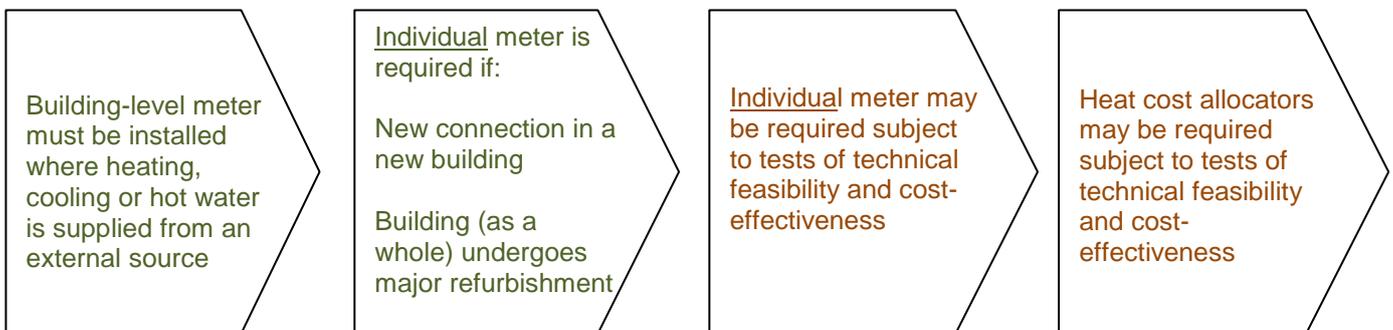
[Multi-apartment/multi-purpose buildings are defined as having either at least two apartments or at least two entities]

3.1 Article 9 makes a number of requirements on heat metering both to measure individual consumption and consumption at the building-level. Some of the requirements are dependent on tests of technical feasibility and cost-efficiency. However, in three instances the requirement is not conditional on such tests. The three are where:

- (i) a new connection is made in a new building;
- (ii) where a building undergoes major renovation; and
- (iii) at the point of delivery or heat exchange to buildings of multi-apartment or multi-purpose use.

3.2 It is important to note Article 9.3 applies to multi-apartment/multi-purpose buildings only.

3.3 The Commission have provided clarification on how Articles 9.1 and 9.3 relate to one another. Article 9.3 requirements should first be applied for **multi-apartment/multi-purpose buildings**. The application of the requirements in 9.1 should then follow the hierarchy of requirements in 9.3, using the following schematic:



3.4 All heat meters, subject to the tests of technical feasibility and cost-effectiveness, must provide final customers with information on their energy consumption.

Technical feasibility and cost-efficiency

The Commission have clarified that Member States are to develop the ‘technical feasibility’ and ‘cost efficiency’ criteria, though these should consider the following areas:

- individual metering of heat consumption in multi-apartment buildings is **technically possible** when the installation of individual meters would not require changing the existing in-house piping for hot water heating.
- Interpreting the concept of ‘**cost-efficiency**’ Member States can compare the costs of the installation and maintenance of the meters/heat cost allocators with the benefits for the end consumer and other parties (owner/user of the building and individual apartments, energy supplier, etc). This calculation can be based on the methodology provided in the European Standard EN 15459 (‘Energy performance of buildings – economic evaluation – procedure for energy systems in buildings’)

3.5 In addition to metering as part of heat networks or district cooling, the Directive also includes communal heating (including the central provision of hot water) in the

requirements of 9.3 for individual consumption meters, subject to tests of technical feasibility and cost efficiency.

- 3.6 Annex A provides some case studies to explain the circumstances in which the heat metering requirements in the Directive apply, or apply but are conditional on tests of technical feasibility and cost efficiency.

The extent of heat metering in the UK

- 3.7 In 2012, DECC commissioned Databuild and the Building Research Establishment to undertake a project to:
- (i) compile a database of heat networks and consumers in the UK (see Annex D), and
 - (ii) to gather evidence to assess the costs and benefits of retrofitting heat meters to domestic and non-domestic buildings connected to heat networks.
- 3.8 The report sought to re-examine the UK compliance with the specific requirements of Article 13 of the Energy Services Directive on heat metering and billing. The report was published in May 2012.
- 3.9 The BRE work revealed that, for mixed end user city type schemes operated by a private company, all of the non-dwellings nodes ie the large heat loads, have revenue standard metering installed and any nodes supplying dwellings will have at least on heat meter at development level. This results from the commercial need to recover investment, fuel and operating costs from the sale of heat.
- 3.10 The BRE work concluded that it was difficult to say how many dwellings are served by heat meters. Responses from the heat networks survey work undertaken by Databuild suggested that approximately 25% of existing residential-led heat networks schemes have heat meters installed. The charging mechanisms for the remaining 75% are based upon apportionment or points based system. This survey and a review of recent case studies demonstrate that heat metering is being installed in new developments, particularly in the housing sector. An earlier study in 2007 indicated that 77% of dwellings in the social housing sector connected to a heat network did not have heat meters.
- 3.11 The Government does not have information on the extent to district cooling or communal heating and/or hot water systems or the extent of the metering of these technologies.

Extent of heat metering

Q 1	DECC is undertaking further evidence gathering on the extent of heat networks and heat metering. In addition to this work, do you have information about smaller heat networks and the extent of metering, including in the non-domestic sector?
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Q 2	Do you have information about the extent of metering of cooling or communal heating, including communal hot water in the UK?
Q 3	<p>The European Commission’s guidance is that meters must comply with the Measuring Implements Directive (MID) and heat cost allocators (HCAs) must comply with the relevant European Standards (EN 834 and EN 835).</p> <p>What steps should the Government take to ensure the accuracy of meters and HCAs at the point of installation and on their on-going accuracy?</p>

Heat meters: costs including installation

3.12 The BRE work in 2012 provided an assessment of the costs of metering, covering the capital cost of the meter, the cost of installation, data gathering and overall running costs. This data is captured in the table below:

Cost description	Cost per dwelling
Capital cost of heat meter	£212
Capital cost of installation of heat meters	£80
Capital cost of data gathering system	£62
Capital cost of installation of data gathering system	£93
Running costs	£81 per year

Source: BRE 2012

3.13 Therefore a total cost in a first year, including installation is estimated to be around £447.

Capital cost – heat meters: The BRE study sought to determine an economic life for heat meters and associated systems. Responses to the study suggested meters would last for up to 20 years, though meters relying on battery power would require battery replacement to reach an economic life of 20 years. On accuracy, heat meters are usually supplied complete with calibration certificates which are valid for a set time period as stated by the competent authority ie the test laboratory. After this time, the heat meter would normally be replaced or recalibrated. In the report it was noted that some suppliers propose a sampling approach to checking and replacing a fraction of meters on a particular heat network and others adopt a ‘fit and forget’ approach. The mean capital cost of £212 resulted from a survey of four suppliers who provided prices for heat meters in a mixed development of 250 dwellings.

Capital cost – installation of heat meters: Only one supplier provided an estimate using the scenario of a development of 250 dwellings. The work involved would be programming the

work, gaining access to dwellings and arranging to isolate an existing heat interface unit (HIU) to install the meter and re-connect the HIU.

Capital cost – data gathering system: Once installed, a meter must be read so that the heat supplied over a given period can be determined and the user billed. The BRE report summarised a range of data collection technology available each with its associated advantages and disadvantages (see table below). The choice of data gathering system will affect the capital cost of the project. In the BRE scenarios three suppliers chose a hard-wired system and the fourth a wireless radio system technology. The report comments that different suppliers applied different weighting factors to the advantages and disadvantages.

Running costs: The on-going costs associated with heat metering were identified as:

- Maintenance – modern heat meters are designed to be maintenance free over their lifetime
- Collection of data – this depends on the technology chosen
- Generating and sending out bills to individual end users
- Collection of money from individual end-users.

3.14 It is important to note the Commission has commented that the use of individual meters or heat cost allocators for measuring individual consumption of heating in multi-apartment buildings supplied by district heating or common central heating is beneficial when customers have a means to control their own individual consumption. They go on to say that this makes sense only in buildings where radiators are equipped with thermostatic radiator valves (TRVs), though clearly there is also a link to central thermostatic controls.

Heat metering cost estimates	
Q 4	Do you agree with the cost estimates for heat meters? Y / N (Please provide supporting evidence)
Q 5	Would the costs of building-level meters serving, communal heating or district cooling be significantly different to the cost of individual meters? Y / N (If NO, please provide supporting evidence or reasoning)
Q 6	Are there any issues when considering replacing one meter with another? Are they necessarily compatible? Y / N (Please provide supporting evidence)

Heat cost allocators

- 3.15 The Energy Efficiency Directive requires that heat cost allocators must be considered in multi-apartment/multi-purpose buildings where individual heat meters have been assessed as not technically feasible or cost effective.
- 3.16 Evaporative heat cost allocators (HCASs) have in the past been vulnerable to tampering, and there can be inconsistencies where evaporation is recorded though no heat is being emitted. However, modern HCAs have better sealing arrangements, are more robust and radio-metered. It is important that HCAs are calibrated to the size of the radiator when first installed. Installation of HCAs is generally considered to be non-invasive though it is usual to install TRVs at the same time to ensure there is an effective means to control heat consumption. Discussions with manufacturers suggest that capital costs are between £50-100 per radio-metered HCA though less for an evaporative HCA that requires manual reading.

Heat cost allocators	
Q 7	Do you have evidence of the overall cost of HCAs – including calibration, installation and maintenance, and when combined with TRV installation?
Q 8	How is hot water consumption measured where HCAs are used and what are the associated costs?

Heat meter installation

- 3.17 The layout of the heat pipes is usually a first consideration in assessing a property's suitability for heat metering. There are broadly two variations of pipe layout in multi-apartment/multi-purpose buildings – a 'single pipe' system or a 'ladder' system. In the former there is a single exchange of heat (often through a heat interface unit) with a single flow and return. A secondary heating system then circulates the heat within the individual home or unit. The ladder arrangement involves heat being drawn directly from a main heat riser to individual radiators and in different rooms. This multiple point of entry is less suitable for heat metering and may be more suited for the installation of heat cost allocators.
- 3.18 It may not be possible to install a heat meter in all homes. Flow meters in general require a certain amount of separation from items like bends and pumps, and as such, can be difficult to fit in some heating systems. Meter installers may be constrained by the accessibility of pipework and inadequate space within which to work. In some cases, it would be possible to adapt the pipework to make it possible to meter, however the expense associated with these modifications could make metering unfeasible for some older heat networks. For new-builds, these design and accessibility issues can be overcome as the pipework can be designed to accommodate a heat meter at the outset.

3.19 To get the most out of a heat meter heating controls are needed. A combination of two types of control is the optimum solution: A programmer to control heating to the whole property, and radiator valves to regulate the temperature of each radiator.

Case study: Pimlico District Heating Undertaking

Built in 1950, the Pimlico District Heating Undertaking (PDHU) was one of the first district heating schemes in the UK.

The network was built at a time when domestic scale heat meters were unavailable, all of the City Council's residential properties connected to PDHU were charged a flat rate set according to number of habitable rooms - and that practice continues to this day.

Lillington Gardens, an estate that was built in the 1960s and connected to PDHU during the 1984 oil crisis, was initially fitted with run-time meters. Each flat had a meter at the side of the front door to aggregate the time for which the flat thermostat was closed and calling for heat. But in 1986 the Lillington Gardens run-time meters were abandoned and residents were put onto the PDHU flat-rate charge. Whilst this move was partly due to unreliability of the run-time meters, it was also because the City Council's Housing Committee noted that tenants had no choice over the thermal performance of the flat they had been allocated.

Sixty three years on, the heat consumption of each of the 69 residential blocks, 55 commercial premises and 3 schools are metered and a web-based service for remotely collecting and archiving consumption data is being installed.

Commercial customers and schools connected to PDHU are billed according to metered consumption and new developments of residential units have individual heat meters installed as a matter of course. But rolling out individual heat meters across the 1950s and 1960s housing stock would be a significant challenge. Most properties receive domestic hot water from large basement calorifiers via a secondary domestic hot water circuit to kitchens and bathrooms. Meanwhile space heating is provided via separate risers that arrive in the flats at the back of bedroom wardrobes. Rationalising the circuits would require extensive and costly refitting.

Metering and billing of flats individually raises other issues. For example, consultation has shown that many residents appreciate flat-rate billing because they can budget more easily for their heating and hot water service.

The consequence is that for now PDHU is considering a move to billing each connected residential block according to metered block consumption with the block bill shared amongst residents on a flat rate. This mid-way option is an affordable compromise that will enable service levels to be tailored according to block preference, will foster a block-level interest in energy conservation and will enable comparison of block consumption in a league table.

Source: CityWest Homes Limited

3.20 With the additional experience gained from the RHPP (Renewable Heat Premium Payment) and non-domestic RHI (Renewable Heat Incentive), it is evident that correct installation of meters can be challenging given the lack of experienced installers. A range of issues need to be overcome including air traps, meter calibration, incorrect orientation,

and meters installed too close to pumps, bends, valves or other fittings.

Heat meter installation	
Q 9	Our assumption is that heat metering is not feasible where installation would require changing the in-house piping for hot water heating in the building – do you agree? Y / N (Please provide supporting evidence)
Q 10	Are there other technical or cost considerations regarding the installation of building-level meters or in metering cooling?
Q 11	Do you have evidence of who currently installs heat meters in existing heat networks – and any qualifications or experience that are required?

Managing the transition from flat-rate to metered charging

- 3.21 Allocating costs for heat can be a significant issue. A potentially large obstacle for allocating heat costs between apartments is the issue of thermal energy leaking between adjacent apartments. Therefore, although an individual flat may have a heat meter installed to measure the amount of heat delivered to a specific apartment, the total amount of heat enjoyed by the individual flat will be greater than that measured due the heat emitted by all the pipework in the building. A flat with a favourable location in the building, with adjacent apartments above, under and at both sides, may be able to meet all its heating needs from the adjacent flats.
- 3.22 Article 9.3 states the Member States may introduce transparent rules on the allocation of the cost of thermal or hot water consumption in multi-apartment/multi-purpose buildings to ensure the transparency and accuracy for individual consumption. The Government is seeking views on whether this optional requirement should be implemented as part of the transposition. It should be noted that an industry-led consumer protection scheme that is under development may address issues of transparency on the allocation of costs.
- 3.23 The Government recognises that there are cases where the introduction of heat metering in those schemes that were previously un-metered and flat charged has been difficult, particularly for households living in dwellings with low levels of energy efficiency in the building fabric. There are examples of the steps that can be taken to begin the transition from flat-rate charging. For example, as part of their metering programme, Camden Council have introduced information on display screens showing real time energy use and historical consumption. Meters can also be set up to provide a basic level of heating for a fixed standing charge with a variable charge above this level according to the tenant’s additional use.
- 3.24 There are a variety of ways to help to make the transition easier, for example in buying heat credits in pre-payment systems is to offer a range of routes to payment, for example:

- cash or card payments at Council offices
- by telephone using a credit or debit card payment
- by Standing Order
- Online
- By Paypoint

3.25 To provide a safety net for consumers, emergency credit can be gained by pressing a button on the pre-payment meter. This gives the user credit for emergency heat and hot water only. On purchasing credit after using the emergency credit amount, this amount will be deducted from the total balance paid.

Transition from flat-rate charging

Q 12	Do you agree the Government should <u>not</u> seek to mandate the introduction of transparent rules on the allocation of costs? Y / N (Please give reasoning)
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4. Billing information and costs

This chapter sets out the requirements of the Directive on billing information and the cost of access to metering and billing information; how the requirements match current practice in the UK and how the Government interprets those requirements that have tests of technical feasibility, cost effectiveness or appropriateness.

Article 10 *Billing information (as it applies to heating, cooling and hot water)*

1. Where final customers do not have smart meters as referred to in Directives 2009/72/EC and 2009/73/EC, Member States shall ensure, by 31 December 2014, that billing information is accurate and based on actual consumption, in accordance with point 1.1 of Annex VII, for all the sectors covered by this Directive, including energy distributors, distribution system operators and retail energy sales companies, where this is technically possible and economically justified.

This obligation may be fulfilled by a system of regular self-reading by the final customers whereby they communicate readings from their meter to the energy supplier. Only when the final customer has not provided a meter reading for a given billing interval shall billing be based on estimated consumption or a flat rate.

3. Independently of whether smart meters have been installed or not, Member States:

- (a) shall require that, to the extent that information on the energy billing and historical consumption of final customers is available, it be made available, at the request of the final customer, to an energy service provider designated by the final customer;*
- (b) shall ensure that final customers are offered the option of electronic billing information and bills and that they receive, on request, a clear and understandable explanation of how their bill was derived, especially where bills are not based on actual consumption;*
- (c) shall ensure that appropriate information is made available with the bill to provide final customers with a comprehensive account of current energy costs, in accordance with Annex VII;*
- (d) may lay down that, at the request of the final customer, the information contained in these bills shall not be considered to constitute a request for payment. In such cases, Member States shall ensure that suppliers of energy sources offer flexible arrangements for actual payments;*
- (e) shall require that information and estimates for energy costs are provided to consumers on demand in a timely manner and in an easily understandable format enabling consumers to compare deals on a like-for-like basis.*

Article 11 *Cost of access to metering and billing information*

1. Member States shall ensure that final customers receive all their bills and billing information for energy consumption free of charge and that final customers also have access to their consumption data in an appropriate way and free of charge.

2. Notwithstanding paragraph 1, the distribution of costs of billing information for the individual consumption of heating and cooling in multi-apartment and multi-purpose buildings pursuant to Article 9(3) shall be carried out on a non-profit basis. Costs resulting from the assignment of this task to a third party, such as a service provider or the local energy supplier, covering the measuring, allocation and accounting for actual individual consumption in such buildings, may be passed onto the final customers to the extent that such costs are reasonable.

4.1 Article 10 applies to all final energy consumers. The table below separates out the Directive’s requirements on billing information, as they apply to final consumers on heat meters or heat cost allocators as opposed to those unmetered consumers charged on a flat-rate basis.

Summary of Article 10 for heating, cooling and hot water consumers

Directive Requirement				
10.1 Billing information to be made available based on actual consumption	10.3 (a) Historical consumption data to be made available, when requested	10.3 (b) Option of electronic billing and billing information and explanation of how bill is derived, where requested	10.3 (c) Where appropriate, provide customers with comprehensive account of current energy costs on a comparative basis	10.3 (e) Where requested, information on energy costs and estimates of energy costs to be provided to compare deals on a like-for-like basis
Application for final consumers where there are <u>no</u> meters or HCAs?				
Does not apply	Does not apply	Applies	Applies	Applies
Application for final consumers where either individual meters or HCAs are installed?				
Billing information required twice yearly or quarterly if requested or if electronically billed, provided technically possible and economically justified	Applies to the extent that such information exists	Applies	Applies	Applies

4.2 The current practice in those properties that are metered is for bills, based on actual consumption, to be issued on monthly, quarterly or an annual basis. Online billing through Automatic Meter Reading allows daily readings. This electronic method of meter reading is considered to be the industry norm where new meters are installed. It is assumed that access to historical data (10.3 (a)) will be based on the online records of consumption and as such will be available for the period where electronic billing has been in place.

4.3 It usual for bills to include the following information:

- No of units consumed
- Unit rate
- Standing charge

- 4.4 The components of the standing charge are not routinely broken down in regular bills. These are either included in the information packs for tenants or in contract statements or supplier agreements from heat suppliers. It is considered unlikely that where an individual meter has been assessed as technically feasible and cost-efficient (and therefore installed), that it would then not be technically possible or economically justified to bill on this basis. There may though be instances where meters or the properties cannot be easily accessed to obtain the relevant metered information.
- 4.5 10.3 (c) requires the provision of comparative data. It is assumed that the condition in Annex VII of ‘where appropriate’ applies primarily to whether a consumer is electronically billed, given the compilation of data and cost and practical implications of providing this data in paper form. As mentioned previously, the move to online billing should support the implementation of this requirement more widely.
- 4.6 10.3 (e) requires the provision of like-for-like data. There are two considerations here affecting the application of this requirement for heat network customers. The first is in ensuring a fair comparison with the point of generation – for example the cost of gas to fuel a CHP plant against that of other gas suppliers. There is also the point about the appropriate counterfactual for the end consumer - whether this would be an individual gas boiler or switching to electric resistive heating. Again, electronic billing may provide the best opportunity to capture this information. Another aspect of comparative billing would be to compare one heat network scheme with another of similar size and composition. Potentially, this could provide the like-for-like data to help to identify those schemes that are particularly inefficient and may best support the overall objective of the Directive.
- 4.7 It should be noted that the Government will have to respond to the Commission on those cases where provision of frequent billing information is not cost effective and communicate this to final consumers – deadline for both is 31 December 2014.
- 4.8 The Government is not proposing to make the optional provisions of Article 10(d) a requirement, though the Government would welcome views on whether this would be beneficial.

Billing information

Q 13	As a heat supplier do you offer electronic billing (or if you are a customer do you receive or have the option of electronic billing)? Y / N What are the costs of introducing electronic billing?
Q 14	Should the Government make the requirement 10.3 (d) mandatory (that, at the request of the final customer, the information contained in these bills shall not be considered to constitute a request for payment. In such cases, Member States shall ensure that suppliers of energy sources offer flexible arrangements for actual payments) Y/N Please

	give reasoning
Q 15	Where an individual heat meter is provided, is that consumer always billed on the basis of actual consumption? Y / N If YES - please provide further information If NO - what are the technical or economic arguments against billing in this way?
Q 16	How should the like-for-like comparison of deals in 10.3 (e) be applied?

Summary of Article 11 for heating, cooling and hot water consumers:

EED Requirement	
<i>11.1 All final customers to receive all consumption data as well as bills and billing information free of charge</i>	<i>11.2 Costs of billing information in multi-apartment and multi-purpose buildings shall be carried out on a not for profit basis. However, where this task is undertaken by a third party, covering the measuring, allocation and accounting for actual energy individual consumption in such buildings, reasonable costs may be passed on to the final consumer.</i>
Application for final consumers where there are <u>no</u> meters or HCAs?	
Applies. However as consumption data relies on measurement of individual consumption, this particular part of the requirement is not applicable	Applies.
Application for final consumers where either individual meters or HCAs are installed?	
Applies.	Applies.

4.9 In Article 11, there is a requirement to ensure final customers receive all their bills and billing information for energy consumption free of charge and those final customers also have access to their consumption data in an appropriate way and free of charge. Specifically, in Article 11.2, the distribution of costs of billing information for individual

consumption of heating and cooling in multi-apartment/multi-purpose buildings shall be carried out on a non-profit basis. Where this service is carried out by a third party, reasonable costs may be passed onto final consumer.

- 4.10 The term 'free of charge' in this context is taken to mean that there cannot be a separate charge for any customer who receives a bill, billing information for energy consumption or consumption data so as to ensure that there is no disincentive to a customer receiving the information to which they are entitled.
- 4.11 Suppliers or other organisations must bear the costs of producing and delivering bills and billing information to final customers. However this does not rule out energy companies giving final customers a discount or bonus for opting for electronic billing and billing information.

Case study: Nottingham District Energy Scheme

The Nottingham District Energy Scheme is one of the oldest and largest in the country, operating continuously since 1972. The network is comprised of 85km of insulated pipework carrying pressurised hot water around Nottingham City Centre and St. Anns (an inner-city residential suburb). This is used to satisfy the heating and hot water requirements of 4,600 domestic dwellings (around 50% are flats). Some of the houses are semi-detached but the majority are terrace and over 100 commercial premises, including hotels, shopping centres, large office developments and a major university. This is complimented by a private wire power network serving a dozen large commercial consumers. Approximately two-thirds of the heat sold is used by the commercial customer base, with the remaining third used by residents in their homes. Generally these homes do not have connections to the gas grid, and use their District Heating supply for all hot water and space heating requirements.

Commercial customers are billed monthly, with domestic customers either being billed quarterly or on pre-payment. All commercial and over 99% of domestic customers are individually metered, as has been the case since the inception of the network.

Originally, domestic meters were of the evaporative type, installed on each radiator in a dwelling. A refit program in the mid-1990s resulted in the evaporating meters being replaced with more accurate E25 magnetic flow meters, which in turn have been phased out in favour of ultrasonic flow sensors. Currently, all domestic customers are being fitted with MID-compliant meters. The roll-out to all 4,600 domestic customers is due to be completed in late March 2014. Calibration of heat meters is verified periodically with clamp on energy meters. Residents have been consulted throughout the project, initially by letter, and latterly through EnviroEnergy representatives attending residents groups' meetings.

Source: EnviroEnergy

Q 17	What are the cost implications of meeting the requirements of Article 11 for heat or cooling network operators or for communal heating schemes?
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4.12 Annex A provides some case studies to explain the circumstances in which the billing information requirements in the Directive apply, or apply with conditions or are optional.

5. Options for implementation

This chapter covers the Government's proposed approach to implementation, the overall policy approach, the main variations in the options, and explores whether Building Regulations should be used as a route to implementation.

The Government's approach to implementation

5.1 The heat networks sector as a whole is not regulated in the same way as gas and electricity markets. An analysis of existing policies has concluded that they do not adequately meet the UK's legal obligation under the Directive. The options appraisal and the accompanying Impact Assessment focuses on the least cost way of implementing the requirements of the Directive and then the costs and benefits of any additional elements that could improve the net benefit to the UK, in line with better regulation principles.

Policy approach and options

5.2 The Government is consulting on six different policy approaches. All of the options would require the lead action on implementation to rest primarily with heat network operators (HNOs). HNOs would be required to implement the metering and billing requirements of the Directive.

5.3 This would involve all owners of such schemes with responsibility for heat networks schemes and heat supply, including:

- Local Authorities
- Housing Associations
- Energy Services Companies (ESCOs)
- Energy companies
- NHS trusts
- University campuses
- Industrial users

5.4 Following this consultation, the Government intends to bring forward secondary legislation establishing the legal framework to meeting the Directive requirements as they apply to heat metering and billing.

The high-level options are:

Option 1: Implementation is supported by detailed unit-level technical feasibility and cost-effectiveness test guidance provided by a scheme administrator. No direct notification of implementation is required. Monitoring is undertaken using a larger sample (as defined by the scheme administrator)

Option 2: Implementation is supported by detailed unit-level technical feasibility and cost-effectiveness test guidance provided by a scheme administrator. Notification of implementation is required. Light- touch monitoring and audit is needed (as defined by the scheme administrator)

Option 3: Implementation is supported by broader building and scheme-level technical feasibility and cost-effectiveness test guidance provided by a scheme administrator. No direct notification of implementation required. Monitoring is undertaken using a larger sample for audit.

Option 4: Implementation is supported by broader building and scheme-level technical feasibility and cost-effectiveness test guidance provided by a scheme administrator. Notification of implementation is required. Light-touch monitoring and audit is needed.

Option 5: Implementation is supported by broader building and scheme-level technical feasibility and cost-effectiveness test guidance provided by a scheme administrator. Notification of implementation required. Light- touch monitoring and audit. Use of building regulations to implement the new connection metering

Option 6: Implementation is supported by broader building and scheme-level technical feasibility and cost-effectiveness test guidance provided by a scheme administrator. Notification of implementation required. Light- touch monitoring and audit. Costs of scheme administration are recovered from heat network operators.

Variations in the policy options

5.5 The variation in the options follows two broad themes:

- on responsibility and support for the application of **cost effectiveness and technical feasibility tests** where these conditions apply to meter installation. The options considered cover either where an assessment of every individual unit is required or where a high-level system-wide sift would be used to identify those properties that would then require unit level assessment. This in turn links to the requirement of notification.
- on **notification, monitoring and enforcement**. The first option proposes detailed unit by unit data reporting to the scheme administrator the result of which would mean the scheme administrator would only use a small sample to survey or inspect for compliance. The other option would not require detailed reporting, thereby reducing the burden on HNOs. Instead this would rely on the scheme administrator using a larger sample to survey and inspect for compliance.
- **Option 5** proposes using the Building Regulations to implement the new connection metering requirement in the Directive. This would apply to this requirement only. However, it would add an additional monitoring and enforcement burden on Building

Control Officers, though only meet one of the metering requirements. Furthermore, incorporating the use of Building Regulations in this way would require England and the Devolved Administrations to separately prepare proposals, consult, seek ministerial consent and amend Building Regulations made under their respective Building Acts in time for the June 2014 transposition deadline. This is unlikely to be practicable, as three out of four administrations have recently completed reviews of energy standard within building regulations.

- The variation in **Option 6** is on the costs of the scheme administration. In this option the costs would be recovered from the heat network operators in the same way that the costs of electricity and gas meters performance is recovered by the National Measurement Office, via Ofgem. This cost recovery arrangement might follow an initial period where the Government supports scheme administration.
- The requirements on billing information are applied in all 6 Options.

The table below captures the key components and variations of the 6 policy options

Option	1	2	3	4	5	6
Detailed unit-level guidance on cost effectiveness and technical feasibility	Yes	Yes	No	No	No	No
Building/system-level guidance on cost-effectiveness and technical feasibility	No	No	Yes	Yes	Yes	Yes
No notification required so larger sample for surveying and on-site visits for monitoring	Yes	No	Yes	No	No	No
Notification required so smaller sample used for surveys and on-site visits	No	Yes	No	Yes	Yes	Yes
Building Regulations used for new connections	No	No	No	No	Yes	No
Cost recovery of scheme administration	No	No	No	No	No	Yes
Billing information and costs	Yes	Yes	Yes	Yes	Yes	Yes

- 5.6 The Government has not identified a clear lead option at this stage, given the difficulty in quantifying the costs and benefits of each option. We will use the consultation responses, feedback from stakeholder engagement, and further analysis to inform a final impact assessment which may produce an alternative preferred option.

Using Building Regulations for all metering requirements

- 5.7 A possible means of implementing the requirements of the Directive for heat metering would be by making building regulations under the powers in the Building Act 1984. However there are a number of reasons why it would not be appropriate to do so:
- Firstly, building regulations cover the erection of new buildings and certain categories of extension to, alteration of, and replacement of controlled services and fittings in existing buildings. The retrospective installation of, or the replacement of, a meter, unaccompanied by other building work, could be added to those categories. However to do so would constitute an extension of the scope of building regulations into an area which they may not be the best means of regulating.
 - Secondly, implementation of the metering requirements is envisaged to be the primary responsibility of heat network operators, and is naturally connected with their continuing responsibilities in respect of accurate metering and billing. Building regulations are not a direct way of regulating the on-going activities of heat network operators, and the incorporation of the metering requirements in building requirements could make it considerably more difficult for heat network operators to identify and comply with their duties.
 - Third, the enforcement of building regulations is the responsibility of local authorities through their building control departments. They can enforce only the requirements in the Building Regulations. Private sector approved inspectors, who carry out about half the building control work in England, have no enforcement powers. The requirements of Article 9.1(a) and 9.3 would be almost impossible to enforce under the current enforcement powers available to local authorities. For these reasons placing duties on local authorities in respect of the metering requirements in the Directive would not result in an effective implementation of the requirements.
 - Fourthly, Building Regulations requirements are now fully devolved, so that any implementation in building regulations relating to England alone would have to be accompanied by equivalent legislation in Wales, Scotland and Northern Ireland. A single scheme administrator approach for heat network operators across all parts of the UK would be more consistent with the historical approach taken to electrical and gas utility metering.
- 5.8 Although the Government is not inclined to use the Building Regulations to implement the metering requirements, this consultation seeks views on the most appropriate way to ensure the requirement for installation of a meter following a 'major renovation' in England, Wales, Scotland and Northern Ireland is communicated to the party with responsibility for the installation.
- 5.9 Building Control Officers could provide a letter of notification for the requirement of a heat meter following a 'major renovation' project (as defined in Directive 2010/31/EU). This would involve the DCLG or the equivalent authority in Devolved Administrations placing a

statutory obligation and/or issuing guidance to this affect for local authorities before June 2014 so that Building Control Officers are ready to include this notification step when signing off building work on properties on heat networks, district cooling or communal heating/hot water that meets this classification. This would ensure the heat network operator was notified of the requirement. It would though require the identification of the organisation responsible for installation (for example, through the heat supplier agreement).

5.10 However, in Scotland, a building warrant is not necessarily required, and the building owner does not have to notify the local authority and it is therefore possible for ‘major renovation’ to be undertaken without their involvement, meaning that this approach would not work in all cases. An alternative approach would, for example, require HNOs to ensure that all building owners were aware of this requirement. This would remove the requirement for local authority administration however it would rely on the building owner’s interpretation of the requirement and decision to notify the HNO. Accordingly, any processes and guidance provided would need to be clear and unambiguous.

Additional issues of relevance to the Devolved Administrations

5.11 Implementation of the Directive requirements may also require legislation by the Devolved Administrations.

5.12 As set out in the District Heating Action Plan, the Scottish Government has set up the Heat Network Partnership to provide support, information and advice to develop district heating projects in Scotland, in parallel to the Heat Network Delivery Unit cover England and Wales. The Partnership does not have a regulatory role but there may be other routes through which the Directive requirements could be implemented in Scotland.

Options for implementation	
Q 18	Which of the options presented, or combination of, do you think would best meet the heat requirements, and why? What alternative approaches might there be?
Q 19	How best do you think the automatic requirement for the installations of an individual heat meter following a ‘major renovation’ should be triggered – through building control officers (where this definition applies in the building regulations) or by placing an obligation on heat network operators to ensure building owners are made aware of this requirement?
Q 20	Are there any particular issues that should be taken into account for the Devolved Administrations?

6. Steps for implementing the Directive

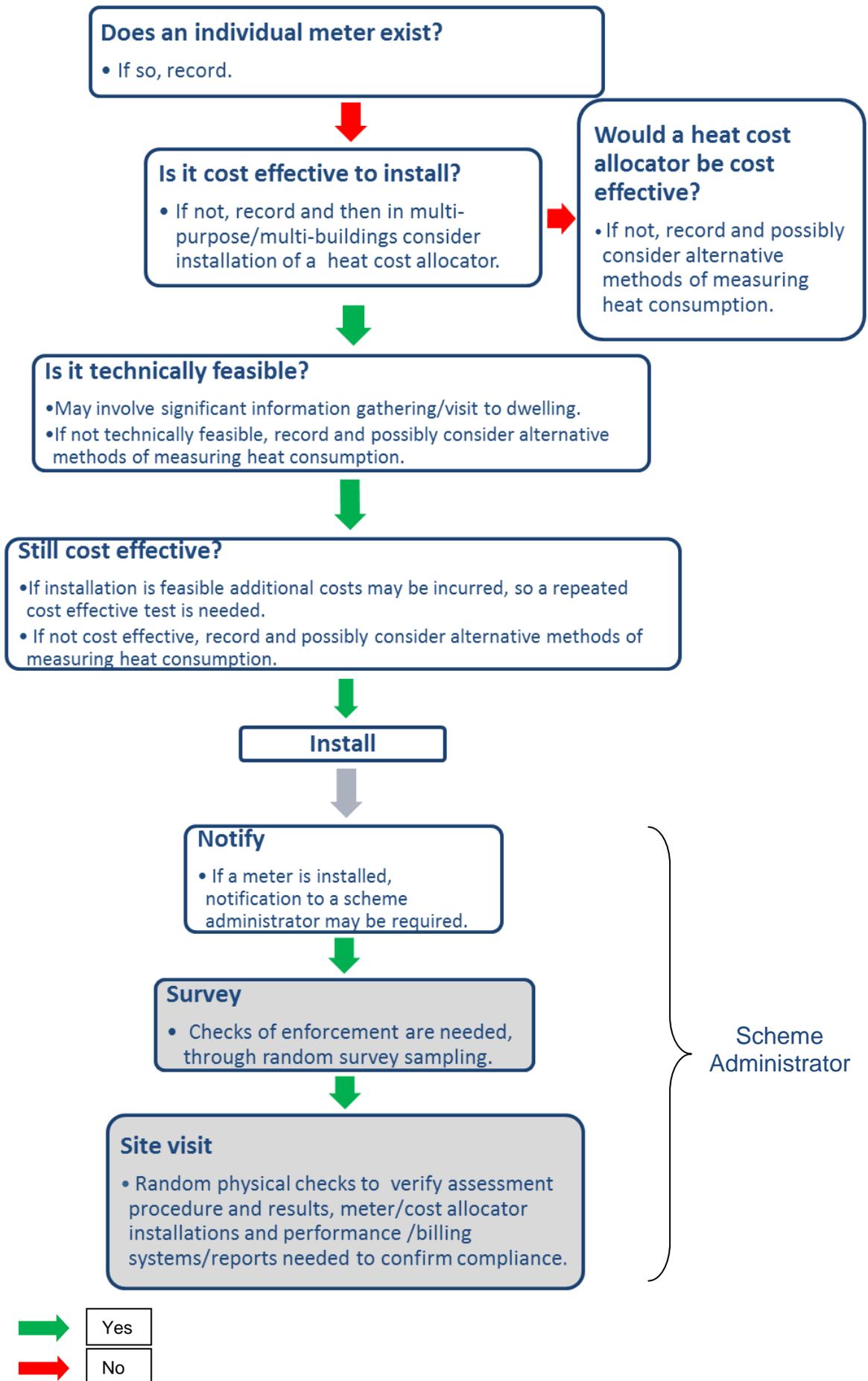
This chapter covers how implementation might work in practice, based on the lead policy option, and considers what the tests of technical feasibility and cost-effectiveness could include.

Implementing the metering requirements (Article 9)

- 6.1 Assuming a least cost implementation route (option 3), it is anticipated that the steps for metering implementation will be:
1. The starting point will require each HNO to ensure their heat networks scheme database and extent of metering currently is understood and recorded – both at building and individual apartment or business unit level.
 2. Based on this initial survey, the HNO will need to establish those instances where there is a **mandatory requirement for a heat meter** (building-level meters in multi-apartment/multi-purpose buildings, major renovations and new connections to new buildings is established).
 3. Meters installed as a result of these mandatory requirements will be recorded.
 4. Guidance to Building Control Officers on the notification requirement for a meter following major renovation will be cascade to all local authorities or this requirement will fall to HNOs to notify building owners.
 5. The Government will provide central guidance to enable HNOs to undertake tests of **technical feasibility and cost-effectiveness**. The details of the guidance will be developed ahead of the transposition deadline of 5 June 2014.
 6. For this consultation it is assumed that the actual assessment would consist of two stages.
 - I. An initial stage where a HNO will assess whether a heat meter is deemed to be cost-effective based on the Government's guidance which will allow a desk-study of the types of properties on a network, using criteria such as on assumed heat demand, insulation-levels, etc.
 - II. For those units where it is deemed to be cost-effective, a second stage would involve a site visit by an engineer to confirm that a meter or heat cost allocator would be technically feasible. This may involve checking that there is sufficient space and access to pipework to install a meter. The site visit would also allow the heat network operator to collect information which may adjust the cost-effectiveness calculation, for instance confirming that there are heating controls installed.

- III. A record would be made of the result of the site survey and inspection and the final action, including whether a heat meter or heat cost allocators are to be/have been installed
 7. A deadline of December 2016 has been set in the Directive for an assessment or installation of individual consumption meters or HCAs in multi-apartment/multi-occupancy buildings, the main type of building connected to heat networks.
 8. The Government will be appointing a monitoring and enforcement body described here as 'the scheme administrator' to carry out sample surveys by correspondence and site visits to ensure the requirements of the Directive are being implemented (see separate section below on 'Scheme administration and enforcement'). It is envisaged that this sampling will be carried out on an annual basis. It is also likely that, in line with better regulation principles and as required by the Directive, the 'scheme administrator' would focus on bringing participants into compliance, with formal enforcement action (including penalties where appropriate) being used only as a last resort.
- 6.2 The assessment criteria on cost-effectiveness will be based on a number of variables, and as such will need to be repeated to ensure on-going accuracy. The Government is consulting on the frequency of future assessments. For the impact assessment our starting point is that assessments will be carried out on a four-yearly basis, which is consistent with the Energy Audit requirements in Article 8 of the Directive.

Figure 1: For the requirement for individual meters, where conditions of technical feasibility and cost effectiveness apply, the following flow diagram sets out the broad approach that might be taken – on assessment, notification and monitoring:



The technical feasibility/cost effectiveness test (Article 9)

- 6.3 On the basis that there will be a requirement for an overall set of guidance to enable HNOs to understand where a heat meter or heat cost allocator may be appropriate, DECC will be commissioning further work in this area in the coming months. This will guide the implementation of these requirements in the Directive.
- 6.4 On cost-effectiveness, this is likely to include the following elements:
- Capital cost of meter, data collection technology, installation cost
 - Annual running costs of meter/HCAs, including data gathering , invoicing and collection of monies
 - Heating and hot water consumption of building by type and age
 - Unit cost of heat
 - Projected fuel cost savings
 - Greenhouse gas savings
 - Installation or presence of heating controls

On technical feasibility, there will need to be a link to the **RHI Heat Meter Installation Good Practice** (through the MCS) which is the subject of a recent consultation.

This contains a set of general principles, for example:

- Ensure the flow meter is installed 20 pipe diameters downstream, and 10 pipe diameters up stream, of bends, valves or other fittings. Where a meter is installed downstream of a double bend then it should be at least 50 pipe diameters downstream.
- Do not install meters downstream of pumps or fast acting valves that could set up pulsating flow.
- Do not install meters at high points in pipework.
- Do not install meters on vertical pipework with upward flow.
- Ensure the meter has the same diameter as the pipework. If a reducer or expander is required these should be at least 20 pipe diameters up stream and 10 pipe diameters downstream of the meter
- Avoid exposed lengths of temperature probe or un-insulated areas of pipe around the probe.
- Ensure that both temperature sensors have the same length of communication cable and that these are within the length limits stated by the manufacturer/supplier.

- Ensure power cables are not routed near meter components or communication cables other than the necessary power connection for the meters.

6.5 Further guidance will issue ahead of the transposition deadline on 5 June to help organisations assess the need for heat meters or heat cost allocators in those instances where tests of technical feasibility and cost-efficiency apply.

Steps for implementation of metering requirements

Q 21	The RHI heat metering guidance has been consulted on through the Microgeneration Certification Scheme (MCS). Do you have views on whether and, if so, how similar guidance may need to be tailored for the metering of heat networks?
Q 22	Do you have evidence or views of how the tests of cost effectiveness and technical feasibility should be applied?
Q 23	Do you agree that the assessment of technical feasibility and cost-efficiency should be undertaken on a 4-yearly basis to reflect real world changes? Y/N If NO, can you explain what would be a more appropriate gap, with reasoning?

Implementing the billing information and cost of access to metering and billing information (Articles 10 & 11)

6.6 Meeting the requirements on billing will need to follow a similar sequence to the implementation of the metering requirements:

- I. Heat suppliers will need to establish where they do or do not meet the requirements on Articles 10 and 11 in their billing, billing information and charging arrangements.
- II. The Government's intention is that heat suppliers should have the flexibility to meet these requirements in the most cost-effective manner.
- III. Where requirements are subject to tests of technical feasibility, cost effectiveness, or appropriateness, heat suppliers will need to be able to demonstrate how they have interpreted these conditions.
- IV. The deadline for implementation of these requirements in multi-apartment/multi-purpose buildings will be 31 December 2016, consistent with the timetable for individual metering assessment/installation.

- 6.7 The scheme administrator will include compliance with Articles 10 and 11 in the sample monitoring that it undertakes on metering implementation.

The technical feasibility/cost effectiveness test (Articles 10)

- 6.8 The Government will provide further guidance on the instances where the provision of frequent billing information based on actual performance is not cost-efficient. Consistent with the requirements of the Directive, this will be publicised by 31 December 2014.

Steps for implementation billing requirements

Q 24	How would it be best to monitor compliance with the billing information (Article 10) and cost of access to metering and billing information (Article 11) requirements?
Q 25	What approach should be taken where some consumers want to sign up to electronic billing while others do not? What are the tipping points in establishing such a mechanism in multi-apartment/multi-purpose buildings?

7. The impact of meeting the Directive's requirements

This chapter covers the impacts of the six policy options as assessed through the accompanying Impact Assessment. The wider impacts of fuel poverty and the consumer behaviour impacts of heat metering are also covered.

The Impact Assessment

- 7.1 A consultation-stage Impact Assessment (IA) has been published alongside this consultation document. For the purposes of conducting the options analysis in the Impact Assessment, six high-level options have been developed, as set out above. These reflect different approaches to realistically implementing the minimum requirements on heat metering. The Impact Assessment looks at the costs and benefits imposed by these requirements in order to assess the least cost means of compliance with the Directive.
- 7.2 The Impact Assessment focusses primarily on the heat metering requirements and costs of billing information. There are a number of other issues discussed in this document on which are seeking views of stakeholders, but which have not been included in the accompanying Impact Assessment. We assess that they are unlikely to have a significant impact on the aggregate costs or benefits of the policy though through this consultation we are seeking views to test this assertion. Overall, through this consultation the Government is seeking views on whether the assumptions and analysis set out the Impact Assessment overestimate or underestimate the costs or benefits of the proposed policy options.
- 7.3 Evidence for the Impact Assessment has been drawn from available sources including the 2007 Desk Study on heat metering and the 2012 BRE study on Heat Metering Costs and Benefits. Evidence on the number of heat networks and their characteristics has been taken from a database DECC commissioned in 2012 prepared by Databuild and BRE.
- 7.4 The main costs imposed by the requirements include the cost of those building-level meters that are mandatory requirements, the costs of assessing technical and cost-effectiveness of individual meters, their installation, administration and notification and the overall scheme administration. The main sources of benefits identified are energy savings, carbon savings and air quality benefits from efficiency gains to heat networks as a result of building level meters. Analysis of the cost-effectiveness of meters suggests that there are no properties which are likely to be cost-effective based on the assumptions used. However there is uncertainty around the costs and benefits surrounding the metering of heat networks. The costs and benefits presented in the Impact Assessment require a number of assumptions to be made to address a lack of evidence. These assumptions can significantly alter the costs and benefits of the options and the Impact Assessment provides sensitivity analysis to illustrate the uncertainty and impact around the costs.
- 7.5 The options considered in the IA also generate a number of costs and benefits which could not be quantified. These are assessed separately as a multi-criteria analysis and include fuel poverty considerations, transfers between customers where metering and consumption charges reflect actual use, implications for back-office billing systems, hassle costs to

HNOs and consumers, wider policy and supply chain benefits of greater meter deployment, the rebound effect on overall energy saving, and the wider benefits gained from data collected as a result of implementation. Two issues, on fuel poverty and consumer behaviour are explored further below.

- 7.6 Therefore, the Impact Assessment does not identify a preferred option. However, in order to allow comparison, costs and benefits of the options are assessed relative to the currently identified least cost option ('Option 3'). Analysis conducted for the final Impact Assessment may produce a different least cost option, as there is uncertainty around the costs and benefits surrounding metering of heat networks.

Fuel poverty

- 7.7 Heat networks offer an important means of achieving low carbon heating, in areas of high heat density. As savings from bulk fuel purchasing and higher efficiency plant (such as CHP) can be passed on through lower charges, they can also lead to fuel bill reductions and therefore make a key contribution to improving affordability of energy for the households they serve. Installing heat networks in, for example, previously electrically heated tower blocks may make a significant impact on lowering fuel costs and therefore on a household's likelihood of being fuel poor or the depth of their fuel poverty. In addition, affordable warmth improves comfort standards and reduces the incidence of cold-related and respiratory illnesses. The situation is more complex in mixed occupancy buildings where some occupants are fuel poor and some are not.
- 7.8 It is important to note that for those vulnerable consumers on heat networks who have been charged for the heat they consume at a flat-rate, there are methods to ensure they are not disadvantaged by new arrangements. For example, meters can be set up to provide a basic level of heating for a fixed standing charge with a variable charge above this level according to the tenant's additional use.

Fuel poverty	
Q 26	Do you have evidence of the impact of heat metering/heat cost allocators on the fuel poor, or how the transition to metered charging has been managed?
Q 27	If you do not currently meter heat in multiple-apartment/multi-purpose buildings, particularly social housing, can you provide evidence of the impact the introduction of heat metering would have?

Case study : Investigating the effectiveness of heat metering in Leicester

The Leicester District Energy Scheme currently consists of 4 separate heat networks across the city, serving a total of approximately 2,900 dwellings. The majority of the dwellings supplied are social housing, though some are private properties. In addition to the domestic consumers, there are 30 non-domestic buildings taking their heat supplies from the scheme, including local authority, community, university and commercial premises.

The commercial operator of the Leicester District Energy Scheme sells heat directly to each of the non-residential buildings, based on metered consumption. Heat sales relating to the residential properties are made to the Local Authority, based on the bulk metered consumption of each estate. The vast majority of domestic properties supplied with heat from the scheme do not currently have individual heat meters and so the local authority levies a flat-rate charge for heat on each dwelling.

Leicester City Council is currently undertaking a research project into the effectiveness of heat metering for domestic properties. A trial installation of individual heat meters has been made at approximately 30 residences

Source: Leicester City Council

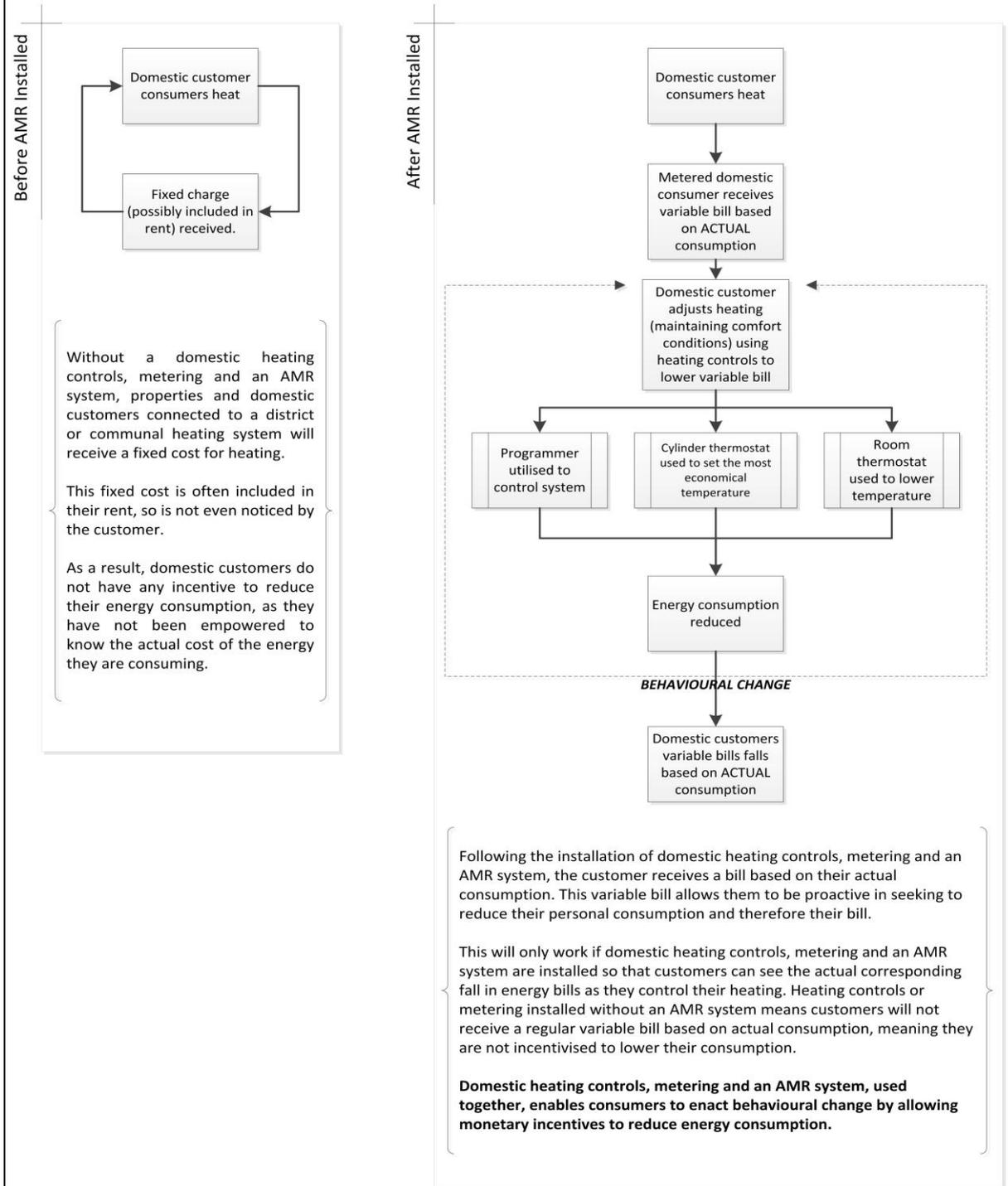
Consumer insight and impacts of heat metering

- 7.9 The European Commission have identified that an assessment of the benefits of installing individual heat meters/heat cost allocators should take into account the different benefits including energy saving among final customers that could be achieved through behavioural changes triggered by the metering data and billing information based on measured heat consumption. Various studies indicate that the range of savings due to behavioural change after the introduction of individual metering and billing based on actual consumption of heat can reach 30% in comparison to systems without individual metering and with billing based on flat rates.
- 7.10 BRE's previous work on heat networks metering highlights a 15-17% realistic minimum energy saving, with up to 30% potential savings. A Danish study saw rented housing energy reductions of 28-42%, however these reductions occurred alongside an extensive information campaign as well as government grants to install controls and other efficiency measures. Another prevalent finding from this study is the noted lag in behavioural change after the transition to individual meters –energy savings lags were observed as being 1-2 years in length.
- 7.11 There was also anecdotal evidence from a previous consultation; where of two identical blocks of flats – one with a meter, one without – revealed a 25-33% reduction in energy in the presence of a meter. However this does not take into account baseline trends. A literature review for Defra found that there was a 5-15% saving to be made from direct feedback (i.e. live monitors) and a 0-10% saving from indirect feedback (i.e. through informative billing), but only one of these studies focussed on heat networks which was from Sweden and failed to include a comparable control group.

- 7.12 After retrofitting heat meters in 4 blocks of 1960s flats, Kiln Place, Camden observed reductions in heat consumption of 30%.
- 7.13 In the accompanying Impact Assessment we have taken into account the low level of this behavioural estimation as well as our lack of information on smart meter costs by including a 20% energy saving as opposed to a 30% reduction (as cited by a number of other sources) in our baseline scenario.

Figure 2: Work undertaken by Ener-g summarises the behaviour change that results from the installation of Meters, Domestic Controls and Automatic Metering Reading (AMR) System.

Installation of Meters, Domestic Controls and Automatic Meter Reading (AMR) System



Source: Ener-g

Consumer behaviour

Q 28	Do you have further evidence of the impact of heat metering/HCAs on consumer behaviour and the resulting impacts on heat consumption?
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8. Scheme Administration and Enforcement

This chapter sets out the potential scheme administration bodies, and options for enforcement action in the cases of non-compliance, and the potential route for appeals.

The scheme administrator

8.1 The scheme administrator will have several key regulatory responsibilities in administering the heat metering requirements of the Directive. The Government envisages that these will include:

- Undertaking, or commissioning through a third party, a system of monitoring of scheme notification and monitoring for compliance, including through sample survey and site visits;
- Responsibility for the central guidance on technical feasibility and cost-effectiveness, though the Government will be responsible for commissioning the first template for this guidance before transposition;
- Responsibility for scheme enforcement.

8.2 The Government considers that a UK wide scheme administrator, working closely with relevant devolved agencies, will reduce administrative complexity for participants and ensure a 'level playing field'. This will however significantly limit the options available for the scheme administration.

8.3 We have we identified two organisations who may be best placed to take on the role of the scheme administrator:

- The National Measurement Office, which has a UK-wide remit; or
- Through an extension to the remit of the Heat Networks Delivery Unit, DECC in England and Wales.

8.4 Although a public regulator will be best placed to act as scheme administrator, this approach need not prevent the scheme administrator from potentially sub-contracting out key elements of its work. For example, where the scheme administrator is responsible for checking the application of the technical feasibility or cost-effectiveness of a heat meter installation (against the centrally provided guidance).

Case study: The role of the NMO on gas and electricity meter accuracy

The key aspects of this work include:

- the monitoring of meter performance through a system of statutory type approval and 'verification' testing
- the potential for on-site inspections of meters where there has been a dispute over meter accuracy
- the sub-contracting of the testing work to an accredited laboratory (run by SGS)

- 8.5 The National Measurement Office (NMO) is an Executive Agency of the Department of Business and Skills (BIS) and is responsible for ensuring fair and accurate measurements are available and used for transactions regulated by law, enforcement of a range of technical and environmental regulations and maintaining the science base for measurement in the UK.
- 8.6 The NMO is also responsible for approving gas and electricity meters used for the purposes of billing and some market surveillance responsibilities for the accuracy of meters in the field. Though it has no enforcement responsibility for schemes that require organisation energy measurement, the NMO, through its enforcement responsibilities under the Energy Related Products Directive, has experience of appliance energy-in-use measurement and, working with UKAS, maintaining and approving Notified Bodies and auditing systems for regulatory requirements under the Weights and Measures Act.
- 8.7 As a UK-wide administrator and enforcement body, NMO is responsible for enforcing a range of technically complex pieces of environmental and measurement based legislation. NMO operates a modern risk based, business-focused authority. NMO aims to minimise burdens on compliant business while using a range of enforcement tools to target identified infringements.
- 8.8 The Heat Networks Delivery Unit, an extension of the Heat and Industry Directorate in DECC, is tasked with working with local authorities to support the deployment of heat networks. The Unit is staffed with engineering, financial and commercial experts with extension knowledge of the heat networks sector. The Unit's remit is one which is focussed on assisting local authorities to take potential schemes to the point of where these are investable propositions, and in the administration of a development funding to support this proposal development. Although the Unit has this specific remit, and is time-limited, it may be well-placed to act in the scheme administrator role in the short-term, while the requirements of the Directive are implemented and the first monitoring is undertaken. The remit of the Unit in its existing role is however limited to England and Wales. Under this option, the Devolved Administrations in Scotland and Northern Ireland would need to identify an alternative route for administering the requirements of the Directive.
- 8.9 Given the similarities with the existing metering work and enforcement powers of the NMO, the Government considers that this should be considered to the preferred scheme administrator. It should be noted that there will be considerable scope for the scheme administrator to outsource some of its work to the private sector. The Government would though welcome views on this recommendation.

- Q 29 Who do you think should be appointed as the scheme administrator?
- a. The National Measurement Office
 - b. DECC, through the HNDU in England and Wales
 - d. Other options, particularly for Northern Ireland and Scotland (and if so, who)?
- Please give reasoning.

A Better Regulation approach to sanctions

Article 13

Penalties

Member States shall lay down the rules on penalties applicable in case of non-compliance with the national provisions adopted pursuant to Articles 7 to 11 and Article 18(3) and shall take the necessary measures to ensure that they are implemented. The penalties provided for shall be effective, proportionate and dissuasive. Member States shall notify those provisions to the Commission by 5 June 2014 and shall notify it without delay of any subsequent amendment affecting them.

8.10 Article 13 of the Directive requires the Government to establish a sanctions regime for non-compliance which is 'effective, proportionate and dissuasive'. The development of a sanctions framework does not prevent more informal methods of enforcement, such as advice or warning letters. The Government considers that sanctions should only be used as a last resort.

Proposed sanctions framework:

8.11 Civil sanctions allow for discretionary, proportionate and cost effective courses of enforcement action to be taken and where appropriate may change the way in which we deliver enforcement solutions.

8.12 The enforcing authority will need to closely follow the Government's better regulation principles and may offer informal courses of enforcement action. These alternatives may include but are not limited to:

- Verbal warnings
- Written warnings
- Negotiated agreements with businesses to make changes

8.13 The Government proposes that, consistent with enforcement practice of the National Measurement Office, three types of civil sanctions should be considered:

Compliance Notice

A compliance notice is a written notice issued by the enforcing authority which requires an economic operator to take actions to ensure compliance with the law and/or return to compliance within a specified period.

Variable Monetary Penalty

A variable monetary penalty is a monetary penalty designed to eliminate financial gain or benefit which we may impose for moderate to serious offences. A variable monetary penalty can be issued in conjunction with a compliance notice.

Enforcement Undertaking

An enforcement undertaking is a voluntary agreement driven by an economic operator to undertake specific actions that would make amends for non-compliance and its effects within a specified timeframe. Each enforcement undertaking will be assessed on a case by case basis and may be offered by the enforcing authority as a discretionary alternative to other enforcement actions.

Deciding Which Civil Sanction to Use

8.14 Civil sanctions allow a better graduated response to instances of non-compliance. The enforcing authority will need to closely follow the Government's better regulation principles as set out in the Regulators' Code. The actions taken will be proportionate and are those that the enforcing authority believes will most efficiently achieve our compliance objectives and ensure that future actions are taken to assure long term compliance. In all cases of non-compliance the full suite of possible actions will be considered and the most appropriate tool selected taking into consideration all the circumstances of the case.

Using Civil Sanctions

8.15 The standards of proof for using the civil sanctions will be as follows:

- To use a **compliance notice** or **variable monetary penalty** the enforcing authority should be satisfied beyond reasonable doubt that an offence has been committed, though we are seeking views on whether a lesser burden of proof should apply, such as the balance of probabilities test.
- An **enforcement undertaking** may be accepted where the enforcing authority has reasonable grounds to suspect that an offence has been committed.

8.16 The Government considers these powers appropriate, proportionate and a necessary backstop to a 'light touch' compliance mechanism, in order to dissuade those organisations from non-compliance.

Circumstances in which a sanction would be imposed

- 8.17 Ultimately, it will be a decision for the enforcing authority to determine the appropriate response to a particular instance of regulatory non-compliance. The Government envisages the following non-compliance situations (A-E) as those most likely to give rise to some form of sanction:
- a. Failure to notify or respond to the enforcing authority.
 - b. Failure to carry out a feasibility test or to install a heat meter or heat cost allocator where required.
 - c. Failure to provide evidence of actions taken when requested by the enforcing authority, or providing misleading information.
 - d. Failure to ensure accurate bills and billing information based on actual consumption are provided, where heat meters or heat cost allocators are installed.
 - e. Refusing to allow the enforcement body access to premises, where access is reasonable (e.g. in order to check the installation of a meter or the application of a technical feasibility/cost-efficiency test)

Non-compliance

- 8.18 Where an economic operator does not comply with a notice within the time limit specified in the notice or fails to comply with an enforcement undertaking the enforcing authority may:
- Serve a non-compliance penalty, or variable monetary penalty;
 - Bring criminal proceedings which may commence up to 6 months after the enforcing authority has notified the economic operator that they have failed to comply
- 8.19 Where an economic operator fails to discharge a non-compliance penalty or variable monetary penalty the enforcement authority may bring criminal proceedings.
- 8.20 The Government considers that the sanctions identified above to be sufficient to incentivise compliance and act as the backstop for dealing with breaches of the regulatory requirements. But would welcome views on this proposed approach.

Sanctions	
Q 30	<p>Do you agree that these sanctions provide appropriate routes to address non-compliance and that these should address the following misdemeanours?</p> <ol style="list-style-type: none"> a. Failure to notify or respond to the enforcing authority. b. Failure to carry out a feasibility test or to install a heat meter or heat cost allocator where required. c. Failure to provide evidence of actions taken when requested by the enforcing authority, or providing misleading information. d. Failure to ensure accurate bills and billing information based on actual consumption are provided, where heat meters or heat cost allocators are installed. e. Refusing to allow the enforcement body access to premises, where access is

	<p>reasonable (e.g. in order to check the installation of a heat meter or the application of a technical feasibility/cost-efficiency test)</p> <p>Yes / No / Any other comments on our proposed approach to enforcement</p>
Q 31	<p>What burden of proof should the enforcing authority apply when assessing whether an offence has been committed - beyond reasonable doubt or a balance of probabilities test or something else? Please give reasoning.</p>

Appeals

- 8.21 At this stage, the Government is considering whether appeals in respect of sanctions imposed under the implementation of Articles 9, 10 and 11 (as they apply to heat metering and billing) should be submitted to the First-Tier Tribunal (FtT). At the same time, we are open to alternative options, and would welcome views.
- 8.22 The FtT is empowered to deal with a wide range of issues which might form the substance of appeals, and to ensure the cases are dealt with in the interest of justice and minimising parties' costs. The composition of a Tribunal is a matter for the Senior President of Tribunals to decide and may include non-legal members with suitable expertise or experience in an appeal in addition to Tribunal judiciary.
- 8.23 If the FtT is selected as the appropriate body to hear appeals in these matters then it would operate under the Tribunal Procedure (First-tier Tribunal) (General Regulatory Chamber) Rules 2009 which provide flexibility for dealing with individual cases and so it is not dealt with in these draft regulations. The General Regulatory Chamber rules can be found at: <http://www.justice.gov.uk/downloads/guidance/courts-and-tribunals/tribunals/tribunals-rules-2009-at010411.pdf>. Rule 2 of the General Regulatory Chamber Rules states its overriding objective as being to deal with a case fairly and justly. This includes dealing with a case in ways which are proportionate to the importance of the case, the complexity of the issues and the anticipated costs and resources of the parties. The Rules give the Tribunal judge wide case management powers in order to achieve these objectives.
- 8.24 The Tribunal may also hear an appeal either orally in a court room or determined on the papers only. This latter written procedure is used if both parties agree that the Tribunal may determine the appeal on the papers without holding a full hearing and the Tribunal is satisfied that it can determine the issues without one. Any party to a case has a right to appeal to the Upper Tribunal on points of law arising from a decision of the First-tier Tribunal. The right may only be exercised with the permission of the First-tier Tribunal or the Upper Tribunal. Where permission is given, the further appeal would be made to the Upper Tribunal.
- 8.25 Under the Rules the FtT has the power to award costs against a party where it considers that a party has acted unreasonably in bringing, defending or conducting the proceedings. The Lord Chancellor has the capacity to charge fees for appeals to the FtT, for example an application fee. Where he is proposing to introduce fees he is required to consult the Senior President of Tribunals. Following this, any such proposal would be subject to

secondary legislation that would need to be debated and agreed by both Houses of Parliament before it would take effect.

Appeals

Q 32 Do you consider that the First-tier Tribunal is the appropriate body to hear and determine appeals against decisions to issue a civil penalty for failure to provide relevant information? Y / N

If NO, please provide reasoning.

Q 33 Do you consider that the General Regulatory Chamber Rules of the First-tier Tribunal will suit the handling of these appeals against decisions by the Secretary of State? If not, why not?

(The General Regulatory Chamber Rules may be found at:

<http://www.justice.gov.uk/guidance/courts-and-tribunals/tribunals/rules.htm>)

Other issues

Other issues you may want to raise

Q 34 Are there any other issues you wish to raise in relation to the requirements on metering and billing that have not been covered in other consultation questions?

Annex A: Scenarios to explain the application of metering and billing requirements

Articles 9.1 and 9.3: Heat metering

<p>Scenario 1:</p> <p>Do building-level meters have to be installed at the 'heating exchanger or point of delivery' on a heat network of individual houses (as opposed to multi-apartment buildings)?</p>	<p>No, the requirement for building-level meters in Article 9.3 only applies to multi-apartment/multi-purpose buildings</p>
<p>Scenario 2:</p> <p>Would an individual heat meter need to be installed where a multi-apartment/multi-purpose building undergoes renovation?</p>	<p>Yes, should the renovation meet the classification of a 'major renovation'.</p> <p>This requirement would not apply where, for example, one flat undergoes 'major renovation'</p>
<p>Scenario 3:</p> <p>Do individual consumption meters need to be installed in individual homes that are connected to a heat network?</p>	<p>Yes, subject to the tests of technical feasibility and cost-effectiveness</p>
<p>Scenario 4:</p> <p>Are non-domestic properties connected to a heat network, regardless of whether they are multi-purpose buildings, subject to the same requirements?</p>	<p>Yes, the Directive applies to all consumers both non-domestic and domestic</p>
<p>Scenario 5:</p> <p>Do the heat metering requirements in the Directive apply to the industrial sector?</p>	<p>Yes, however heat metering is extensively used in this sector already as part of the particular commercial arrangements for heat transfer between sites or for re-use within a plant or site.</p>
<p>Scenario 6:</p> <p>Where a communal boiler provides heating</p>	<p>No, the requirement for such a building-level</p>

and hot water to a number of flats and businesses in one building - is there a requirement for meters at the 'heating exchanger or point of delivery'?	meter is for the supply of heating, cooling or hot water from external sources.
Scenario 7: Are heat cost allocators an option in multi-apartment/multi-purpose buildings where a new connection has been made in a new building or where major renovations have been undertaken?	No, heat meters must be installed, Conditions of technical feasibility and cost-efficiency do not apply
Scenario 8: Does the hot water consumption in a flat need to be measured is a flat network where cost allocators have been installed?	Yes, subject to the tests of technical feasibility and cost-effectiveness, although it would be unusual to have one route of heat supply measured and one unmeasured.
Scenario 9: A flat has heat cost allocators installed, does this mean no further assessment is required?	No, an assessment of the technical feasibility and cost-effectiveness of a heat meter should still be carried out
Scenario 10: In a multi-apartment/multi-purpose building a meter has stopped working and needs replacing – is this an automatic replacement?	Yes, it will be an automatic replacement where the meter is a 'building-level' meter. Individual consumption meter replacement will be subject to the tests of technical feasibility and cost-efficiency. HCAs will need to be considered in the instances where a meter fails to pass the tests.
Scenario 11: A central cooling source provides cooling to a mix of commercial units and domestic flats in the same building – is individual consumption metering required?	Yes, subject to the tests of technical feasibility and cost-effectiveness. The deadline for installation where these tests are met is 31 December 2016.

Articles 10 and 11: Billing information

Scenario A: What are the requirements for billing information if I live in a multi-apartment/multi-purpose building?	The critical pre-assumption for the obligation for the provision of accurate billing information based on actual consumption is the availability
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	<p>of individual metering equipment (as meters or heat cost allocators). If these are <u>not</u> installed billing information does not have to be provided.</p> <p>Where meters or heat cost allocators <u>are</u> installed, and subject to tests of technical possibility and cost-effectiveness, billing information of heating and hot water must be supplied at least twice a year or quarterly when requested by customers.</p>
<p>Scenario B:</p> <p>What are the rules on the frequency with which those on un-metered flat-rate charges should be provided with billing information?</p>	<p>There are no set requirements in this case. It relies on the installation of heat meters or heat cost allocators.</p>
<p>Scenario C:</p> <p>I am a heat supplier, do I have to provide historical data to a customer?</p>	<p>Yes, where such data on individual consumption is stored.</p>
<p>Scenario D:</p> <p>I am a heat supplier charging on a flat-rate basis, do I need to offer my customers the option of electronic bills and billing information?</p>	<p>Yes, all final customers are to be offered this.</p>
<p>Scenario E:</p> <p>Heat meters are installed but rely on meter readings by customers – what happens if the customers do not read their meters?</p>	<p>It is only permissible for billing information to be provided based on estimated consumption or flat rates in situations where for a given interval for billing information, the final customer for whatever reason has not provided a meter reading.</p>
<p>Scenario F:</p> <p>How often must I provide individual bills based on actual consumption to customers with individual meters?</p>	<p>These must be produced at least annually</p>
<p>Scenario G:</p> <p>As a heat supplier do I have to ensure that information on current energy costs is provided as in 10.3 (c)?</p>	<p>Yes, but only where appropriate – this is a condition contained in Annex VII, referred to in the Article. We anticipate that appropriate conditions will include where a system of electronic billing is in place.</p>

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Annex B: Relevant extracts from Energy Efficiency Directive

Article 9

Metering

1. Member States shall ensure that, in so far as it is technically possible, financially reasonable and proportionate in relation to the potential energy savings, final customers for electricity, natural gas, district heating, district cooling and domestic hot water are provided with competitively priced individual meters that accurately reflect the final customer's actual energy consumption and that provide information on actual time of use.

Such a competitively priced individual meter shall always be provided when:

(a) an existing meter is replaced, unless this is technically impossible or not cost-effective in relation to the estimated potential savings in the long term;

(b) a new connection is made in a new building or a building undergoes major renovations, as set out in Directive 2010/31/EU.

2. Where, and to the extent that, Member States implement intelligent metering systems and roll out smart meters for natural gas and/or electricity in accordance with Directives 2009/72/EC and 2009/73/EC:

(a) they shall ensure that the metering systems provide to final customers information on actual time of use and that the objectives of energy efficiency and benefits for final customers are fully taken into account when establishing the minimum functionalities of the meters and the obligations imposed on market participants;

(b) they shall ensure the security of the smart meters and data communication, and the privacy of final customers, in compliance with relevant Union data protection and privacy legislation;

(c) in the case of electricity and at the request of the final customer, they shall require meter operators to ensure that the meter or meters can account for electricity put into the grid from the final customer's premises;

(d) they shall ensure that if final customers request it, metering data on their electricity input and off-take is made available to them or to a third party acting on behalf of the final customer in an easily understandable format that they can use to compare deals on a like-for-like basis;

(e) they shall require that appropriate advice and information be given to customers at the time of installation of smart meters, in particular about their full potential with regard to meter reading management and the monitoring of energy consumption.

3. Where heating and cooling or hot water are supplied to a building from a district heating network or from a central source servicing multiple buildings, a heat or hot water meter shall be installed at the heating exchanger or point of delivery.

In multi-apartment and multi-purpose buildings with a central heating/cooling source or supplied from a district heating network or from a central source serving multiple buildings, individual consumption meters shall also be installed by 31 December 2016 to measure the consumption of heat or cooling or hot water for each unit where technically feasible and cost-efficient. Where the use of individual meters is not technically feasible or not cost-efficient, to measure heating, individual heat cost allocators shall be used for measuring heat consumption at each radiator, unless it is shown by the Member State in question that the installation of such heat cost allocators would not be cost-efficient. In those cases, alternative cost-efficient methods of heat consumption measurement may be considered. EN L 315/18 Official Journal of the European Union 14.11.2012

Where multi-apartment buildings are supplied from district heating or cooling, or where own common heating or cooling systems for such buildings are prevalent, Member States may introduce transparent rules on the allocation of the cost of thermal or hot water consumption in such buildings to ensure transparency and accuracy of accounting for individual consumption. Where appropriate, such rules shall include guidelines on the way to allocate costs for heat and/or hot water that is used as follows:

(a) hot water for domestic needs;

(b) heat radiated from the building installation and for the purpose of heating the common areas (where staircases and corridors are equipped with radiators);

(c) for the purpose of heating apartments.

Article 10

Billing information

1. Where final customers do not have smart meters as referred to in Directives 2009/72/EC and 2009/73/EC, Member States shall ensure, by 31 December 2014, that billing information is accurate and based on actual consumption, in accordance with point 1.1 of Annex VII, for all the sectors covered by this Directive, including energy distributors, distribution system operators and retail energy sales companies, where this is technically possible and economically justified.

This obligation may be fulfilled by a system of regular self-reading by the final customers whereby they communicate readings from their meter to the energy supplier. Only when the final customer has not provided a meter reading for a given billing interval shall billing be based on estimated consumption or a flat rate.

2. Meters installed in accordance with Directives 2009/72/EC and 2009/73/EC shall enable accurate billing information based on actual consumption. Member States shall ensure that final customers have the possibility of easy access to complementary information on historical consumption allowing detailed self-checks.

Complementary information on historical consumption shall include:

(a) cumulative data for at least the three previous years or the period since the start of the supply contract if this is shorter. The data shall correspond to the intervals for which frequent billing information has been produced; and

(b) detailed data according to the time of use for any day, week, month and year. These data shall be made available to the final customer via the internet or the meter interface for the period of at least the previous 24 months or the period since the start of the supply contract if this is shorter.

3. Independently of whether smart meters have been installed or not, Member States:

(a) shall require that, to the extent that information on the energy billing and historical consumption of final customers is available, it be made available, at the request of the final customer, to an energy service provider designated by the final customer;

(b) shall ensure that final customers are offered the option of electronic billing information and bills and that they receive, on request, a clear and understandable explanation of how their bill was derived, especially where bills are not based on actual consumption;

(c) shall ensure that appropriate information is made available with the bill to provide final customers with a comprehensive account of current energy costs, in accordance with Annex VII;

(d) may lay down that, at the request of the final customer, the information contained in these bills shall not be considered to constitute a request for payment. In such cases, Member States shall ensure that suppliers of energy sources offer flexible arrangements for actual payments;

(e) shall require that information and estimates for energy costs are provided to consumers on demand in a timely manner and in an easily understandable format enabling consumers to compare deals on a like-for-like basis.

Article 11

Cost of access to metering and billing information

1. Member States shall ensure that final customers receive all their bills and billing information for energy consumption free of charge and that final customers also have access to their consumption data in an appropriate way and free of charge.

2. Notwithstanding paragraph 1, the distribution of costs of billing information for the individual consumption of heating and cooling in multi-apartment and multi-purpose buildings pursuant to Article 9(3) shall be carried out on a non-profit basis. Costs resulting from the assignment of this task to a third party, such as a service provider or the local energy supplier, covering the measuring, allocation and accounting for actual individual consumption in such buildings, may be passed onto the final customers to the extent that such costs are reasonable.

Article 13

Penalties

Member States shall lay down the rules on penalties applicable in case of non-compliance with the national provisions adopted pursuant to Articles 7 to 11 and Article 18(3) and shall take the necessary measures to ensure that they are implemented. The penalties provided for shall be effective, proportionate and dissuasive. Member States shall notify those provisions to the Commission by 5 June 2014 and shall notify it without delay of any subsequent amendment affecting them.

Annex C: Definitions

1. *'District heating' or 'district cooling' means the distribution of thermal energy in the form of steam, hot water or chilled liquids, from a central source of production through a network to multiple buildings or sites, for the use of space or process heating or cooling;*

(From DIRECTIVE 2009/28/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 April 2009 on the promotion of the use of energy from renewable sources)

2. *"Multi-apartment building" : a building with at least two apartments*
3. *"Multi-purpose building" : a building with at least two entities*
4. *"Technically feasible": individual metering of heat consumption in multi-apartment buildings is technically possible when the installation of individual meters would not require changing the existing in-house piping for hot water heating.*
5. *"Cost-efficient": Interpreting the concept of 'cost-efficiency' Member States can compare the costs of the installation and maintenance of the meters/heat cost allocators with the benefits for the end consumer and other parties (owner/user of the building and individual apartments, energy supplier, etc). This calculation can be based on the methodology provided in the European Standard EN 15459 ('Energy performance of buildings - economic evaluation -procedure for energy systems in buildings')*
6. *"Final customer": "a natural or legal person who purchases energy for end use"*
7. *"Major renovation": Major renovations are defined in EU Directive 2010/31/EU as: (a) The total cost of the renovation relating to the building envelope, or the technical systems is higher than 25% of the value of the building, excluding the value of the land upon which the building is situated; or (b) more than 25% of the surface of the building envelope undergoes renovation.*

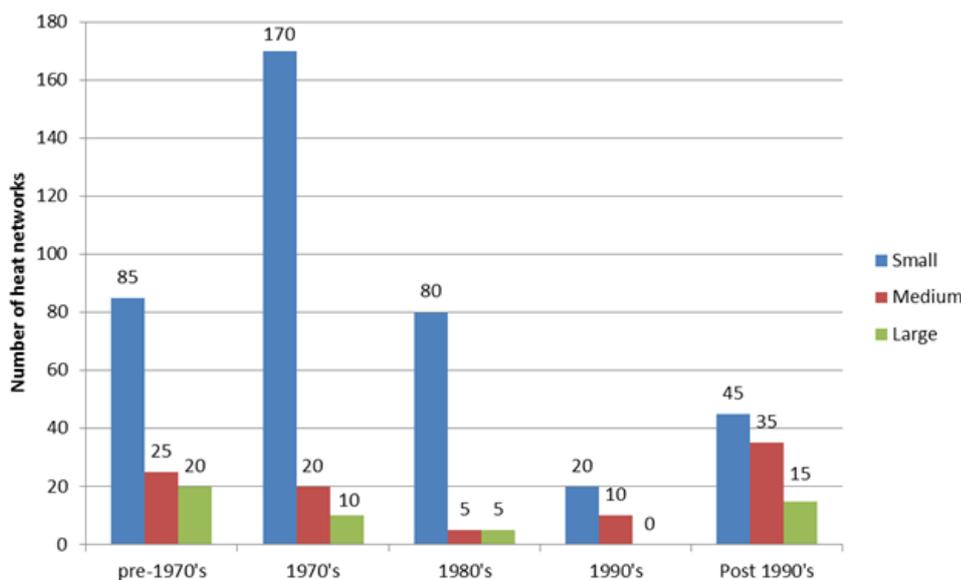
Annex D: Heat networks and heat meters background

Heat networks

In a heating (district heating) network one or more central sources provide hot water which is conveyed to the users who can be domestic consumers, commercial buildings and appropriate industries by means of insulated water pipes. The same applies for cooling networks.

In the UK and across Europe, heat networks were first used in urban areas, predominantly in blocks of flats. They became popular in the UK for new developments of this type during the 1960s and 1970s (see Fig 3). Many of the schemes in operation today in the UK originate from this period. For a number of reasons, including the waning popularity of high-rise housing developments during the 1980s and 1990s, and the poor design, construction and economic performance of some early heat network schemes, heat networks fell out of favour. Over the past decade, as gas prices have risen, and local authorities have looked for ways to cut carbon emissions in projects that can also deliver benefits such as addressing fuel poverty, the case for heat networks has strengthened. Heat networks can provide cheaper heating costs compared to individual heating solutions. A number of new schemes have recently been built and the Government is now actively supporting the expansion of this heating technology.

Figure 3: Number of networks by size and age band (where age was recorded)



Source: Databuild survey, where a district heating network was defined as either:

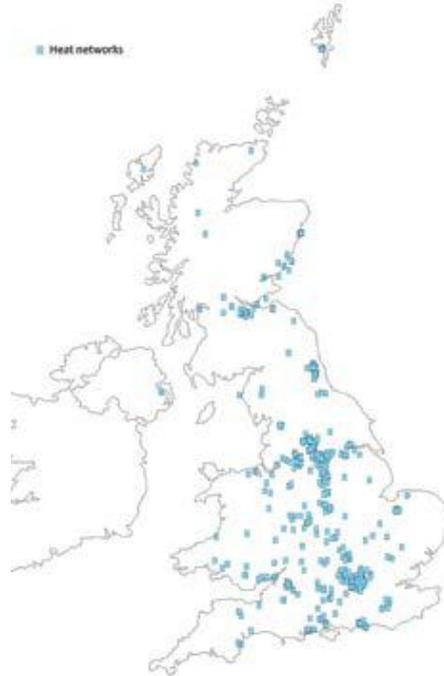
- Two or more distinct buildings connected to a single heat source or
- One building in which there are more than ten individual customers connected to a single heat source.

(See section below on 'the extent of heat metering in the UK')

The amount of heat supplied to buildings in the UK via heat networks is around 2% of

domestic, public sector and commercial heat demand. This amounts to around 2000 networks serving approximately 210,000 dwellings and 1,700 commercial and public buildings across the UK. The largest networks are predominantly found in the UK's largest cities and on university campuses.

Figure 4 Map of heat networks across the UK



Source: Databuild with DECC additions

Types of heat network

In the UK, heat networks typically fall into one of four broad types:

- local authority-led schemes including the connection of schools, leisure centres other public buildings and social housing;
- private sector developments on new housing schemes, which may also include blocks of flats or commercial developments;
- standalone campus networks serving hospital sites or universities; and
- many schemes in individual social housing blocks built in the 1960s and 1970s, which are not generally low carbon, are unmetered and difficult to control. They can be less efficient and more expensive than individual gas boiler systems.

There are a significant number of small-scale heat networks in rural off-gas areas typically connecting a few building in local communities or on farms and estates. These are predominantly renewable heat schemes.

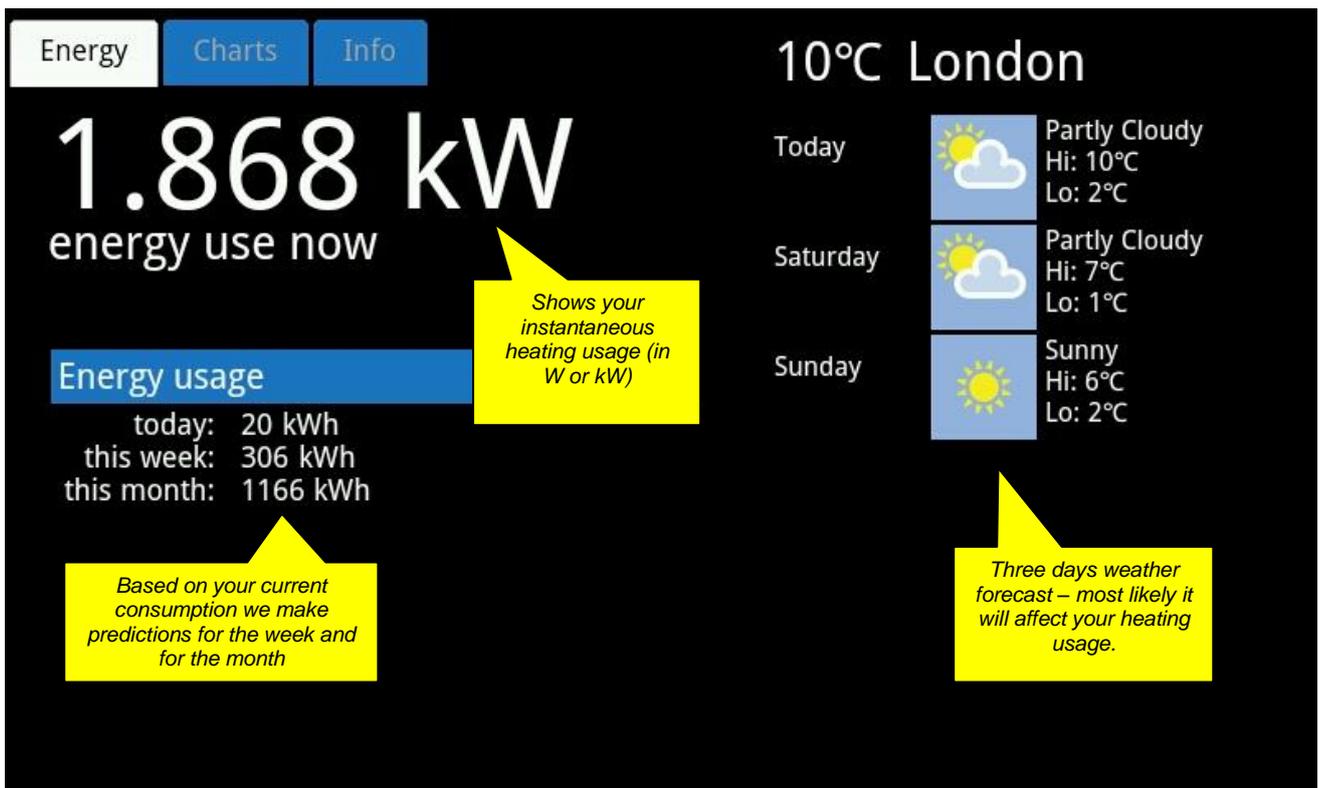
Heat meters

A heat meter is a device that measures the temperature difference between the flow and return pipes and the volume of water flowing through the meter. Heat meters come in a range of sizes and are capable of dealing with a range of flow strengths and temperatures.

Heat metering installations

The installation of a heat meter involves some plumbing and electrical work. The most common installation in new developments is the use of heat interface units (HIUs) – which link the main heat network with the final or ‘secondary’ heating system in the individual dwelling or unit. HIUs usually have heat meters installed, or a place for their installation as an integral part of the unit. HIUs also contain flow controls, isolation valves. Instantaneous domestic hot water supplies are generated in a plate heat exchanger and space heating circuits can be either directly connected to the residence’s systems or also connected via a plate heat exchanger. HIUs are typically pre-fabricated units, constructed to be similar in size and appearance to domestic ‘combi boilers’. The domestic heating controls can operate in exactly the same way as with any other central heating system.

Figure 5: Example of Wi-Fi network display screen



Source: Camden Council

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