



The Heat Network Regulations (Metering & Billing) 2014

Tuesday 9th June 2015
Leeds



www.switch2.co.uk



Agenda

- Introduction
- Overview of the regulations – Chris Smith, National Measurement and Regulation Office
- Implementation of the regulations – Ian Allan, Switch2
- Clydes Biomass District Heating Project – Jon Andrews, Leeds City Council
- Question and answer session

Heat Networks Metering and Billing

Chris Smith

NMRO



Regulations



Scope 1

- District Heat Networks
 - Multiple buildings
 - 1 or more customers
- Communal Heating
 - 1 building
 - Multiple customers

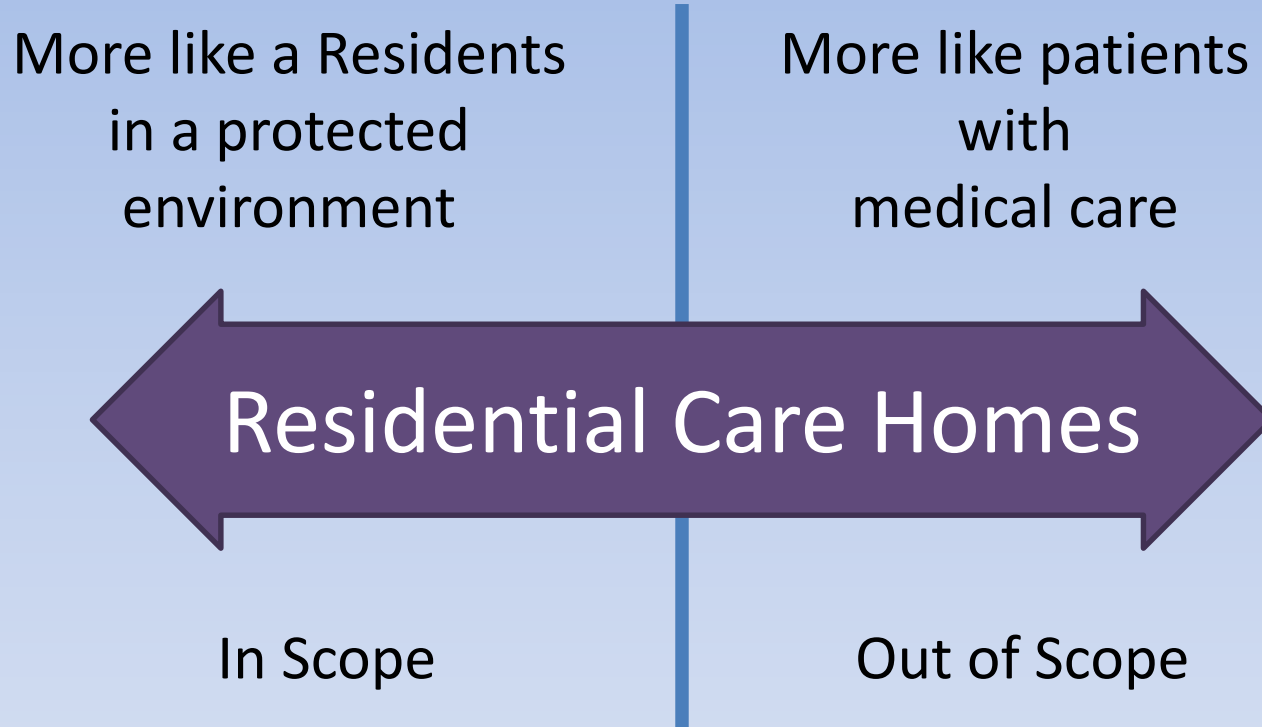


Scope 2

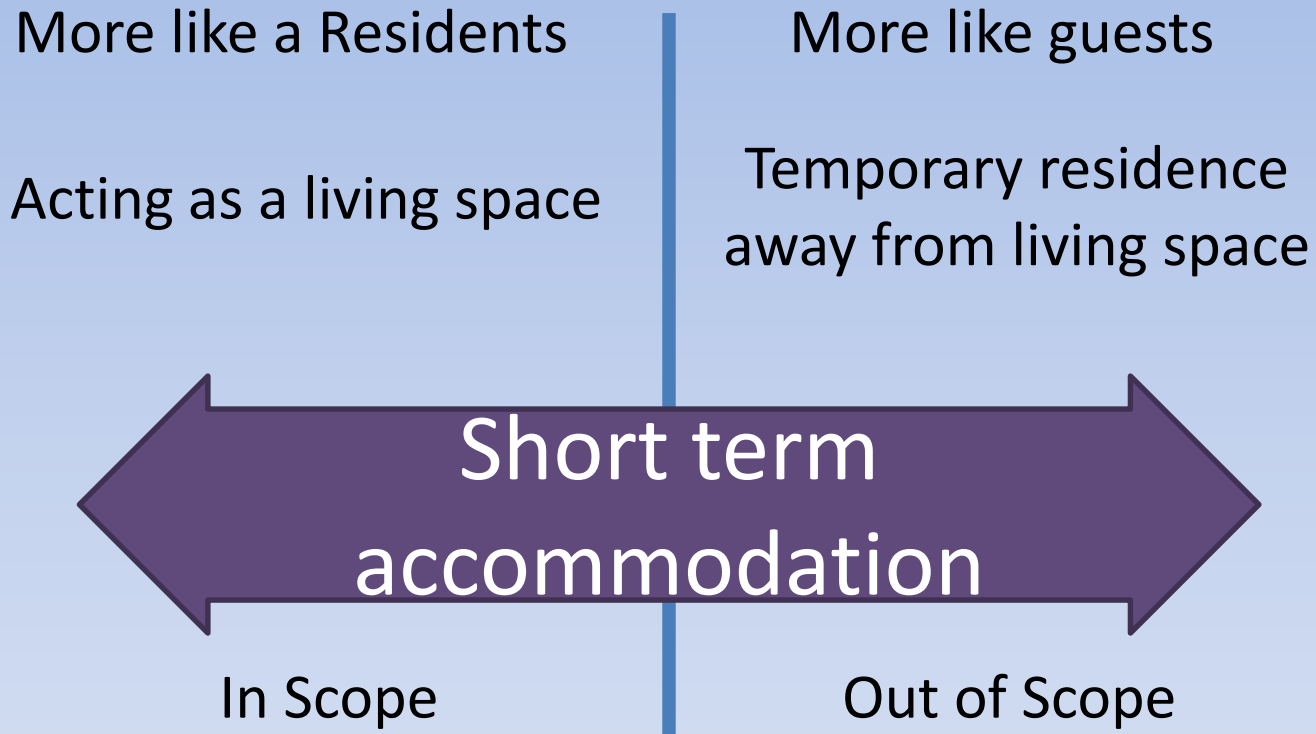
- Apartment (domestic)
 - Cooking facilities
 - Sanitary facilities
 - Used as living space
- Multi use (non-domestic)
 - Partitioned space
 - Non-residential activity
 - May be some shared services



Example of approach to determining scope: Care Homes



Example of approach to determining scope: Shorter term



Scope 3

- Heating via distributed
 - hot water
 - Steam
- Cooling via distributed
 - Chilled liquids
- Hot water



Duty to install meters or HCAs

- For DH, **block-level meters** required for buildings with more than one final customer
- **Individual meters and temperature control devices** must be installed unless it is not **cost effective or technically feasible** to do so
- In buildings with more than one final customer, where individual meters are not viable, then **heat cost allocators, TRVs and a hot water meter** must be installed, where feasible



Meter viability and meter accuracy

- Meters must accurately measure, memorise and display consumption by a final customer.
- Where the installed meter has been approved under the **Measuring Instruments Directive (MID)** and properly maintained the NMO will generally accept this as of appropriate quality



New buildings and major renovations

District Heat

- Individual meters must be installed where a **new DH connection is made to a newly constructed building**, or where a building supplied by DH undergoes **major renovation** (that relate to the technical services of the building)
- Major renovation is defined as costing greater than 25% of the value of the building, excluding land.



New buildings and major renovations

Communal

- From 31 December 2016 individual meters must be installed where a **to a newly constructed building**, or where a building undergoes **major renovation** (that relate to the technical services of the building) where it is technically and economically feasible to do so.
- Major renovation is defined as costing greater than 25% of the value of the building, excluding land.



Billing

- Where meters are fitted, if technically possible and economically justified **bills and billing information must be accurate, based on actual consumption, and comply with Schedule 2**
- Heat Suppliers **must not make a specific charge** for the provision of a bill or billing information but **reasonable costs** may be passed on to final customers



Timings

- Came into force 18 December 2014
 - DHN requirements from this date
- Billing 30 December 2014
 - DHNs and Communal
- Notifications 31 December 2015
 - Or completion of a project (i.e first customers) if after that date
- For buildings with more than one final customer: viability tests (and any installation) by 31 December 2016
- Bills at least annually and billing information at least twice per year



Heat Supplier

- Who is:
 - Supplying heat to the Final Customer?
 - Collecting payment?
 - Buying fuel?
 - Authority to fit meters?
- Could be (case by case)
 - Owner
 - Operator/managing agent
 - Service agent
 - Other



Feasibility

- Technical and Economic
- Return on investment in 10 years

Feasibility test does not apply to building level meters in multi-occupancy buildings on DHNs



Notifications

- 31 December 2015
- Notifications Template
- Minimum of statutory information
- UPRNs for Scotland
- Bulk form
- Incomplete forms will require follow up

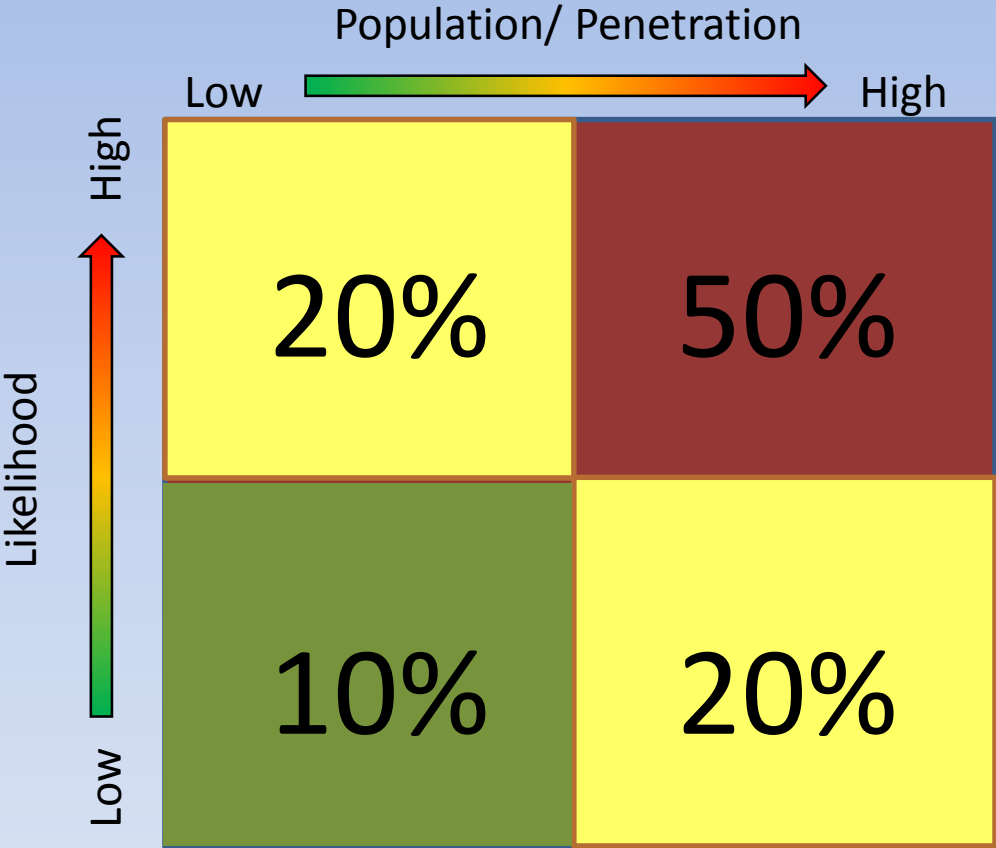
Email box: heatnotifications@nmo.gov.uk



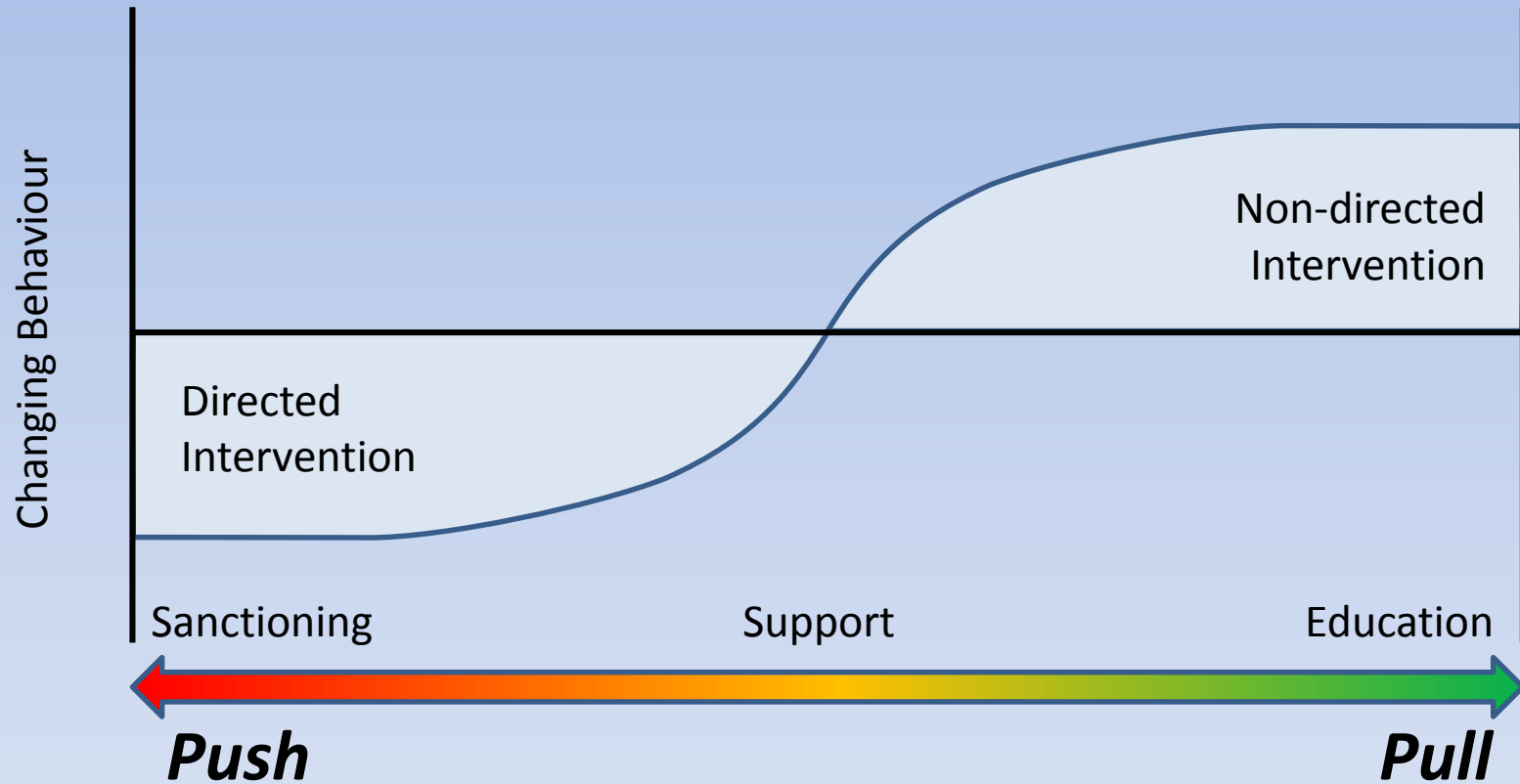
Approach to Enforcement



Based on Intelligence and Risk

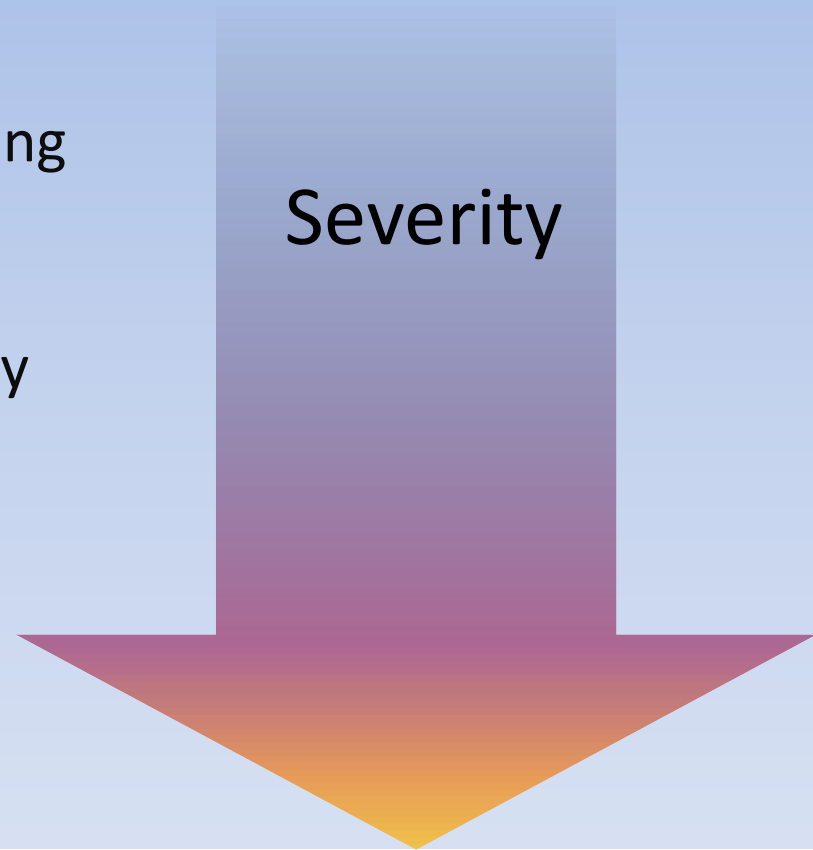


Balanced Enforcement Model



Proportionate Actions

- Informal Warning
- Enforcement Undertaking
- Compliance Notice
- Non-compliance Penalty
- Formal Caution
- Court Action
- Publicity



Chris Smith
National Measurement and Regulation Office



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<https://www.gov.uk/government/collections/national-measurement-office-enforcement-authority>





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Agenda

- Overview of Switch2
- Benefits of final customer metering
- Introducing final customer meters
- Case study
- Point of entry meters
- Billing
- Questions

Switch2

- Over 35 years experience providing metering and billing solutions
- Focused on communal heating and district energy schemes
- Pioneers in the application of heat interface units in the UK supported by tailored metering solutions, including fully supported prepayment and credit solutions.



£15m handling
client monies



16 million meter
readings annually



50,000 dwellings
across 400 sites



52,000 HIUs &
25,000 prepayment
units in the market



20 million billing
transactions annually

Meeting the challenges of community heating



Customer satisfaction



Reduce exposure to debt



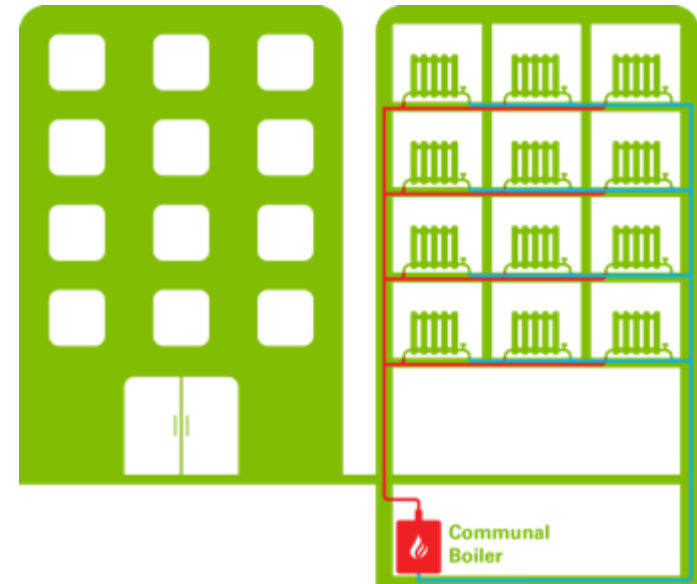
Regulatory requirements



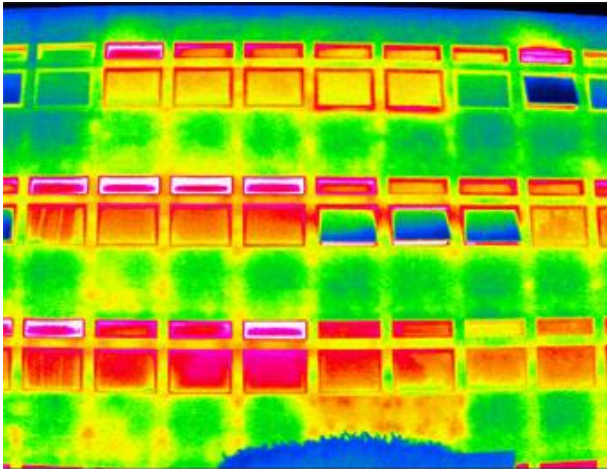
Vulnerable residents



Budgeting and affordability



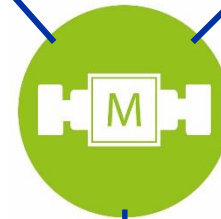
Benefits of final customer metering



Open windows in winter – a symptom of flat rate charging for heat?

Reduces CO2
emissions

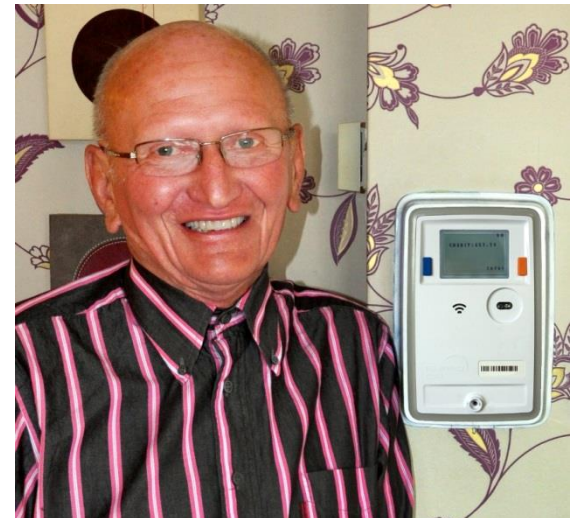
Reduces
consumption



**Addresses fuel
poverty through
behavioural change**

Introducing final customer meters

- Metering strategy
- Quality AMR and meters
- PAYG reduces debt and is now convenient
- Consumer engagement
- Tariffs and charging structure
- Controls
- Planning and partnership



Case Study: Sheffield City Council



Residents supported move to PAYG



5,000 dwellings flat rate charged



Early resident liaison key in a project of this scale



Residents happy with new metered PAYG system



Bills reduced in some cases by 40%

“Metering gives customers greater choice... Used sensibly we anticipate customers will have the potential to make real savings in their heating bills in the future.”
Sheffield City Council



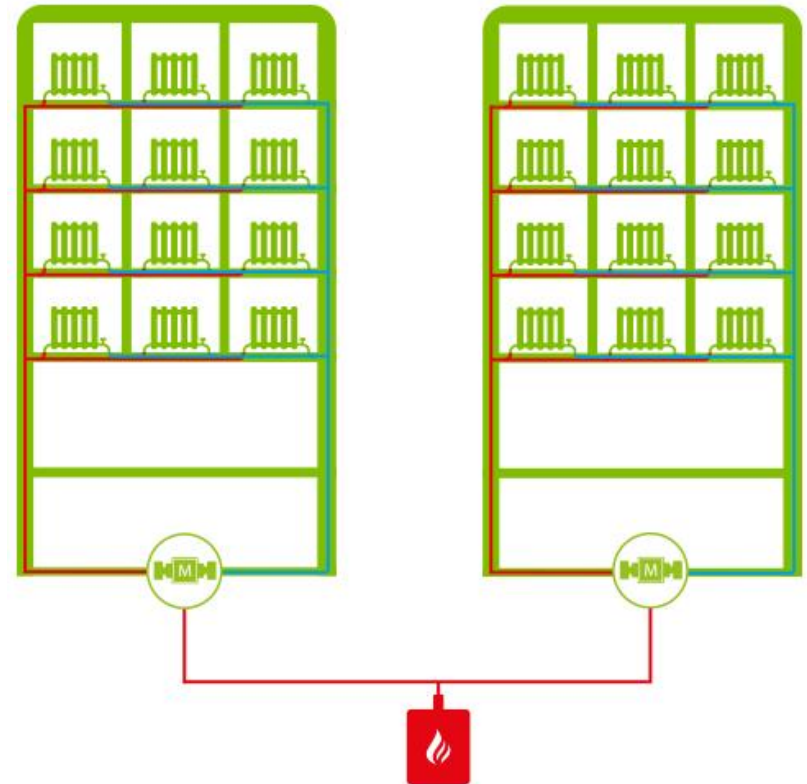
Resident liaison

- Engagement campaigns
- Support for residents
- Helps with understanding and usage
- Ultimately helps them save money on bills
- Helpful materials

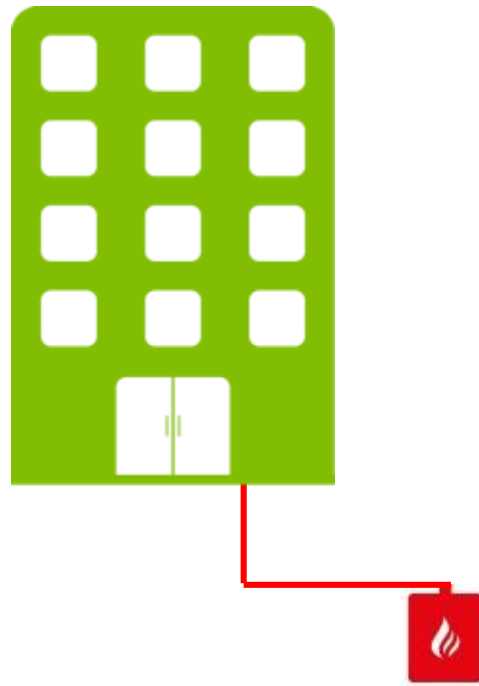


Point of entry meters

- Control and management of heat delivery process
- The percentage delivered from the point of entry meter to the endpoint meters varies between different buildings considerably depending on design and construction
- Building up experiences of efficiencies and demand feeding into improved designs for the future
- If heat cost allocators are used then this is the only point measurement in a SI unit (kWh)



Question: Should there be any point of entry meters?



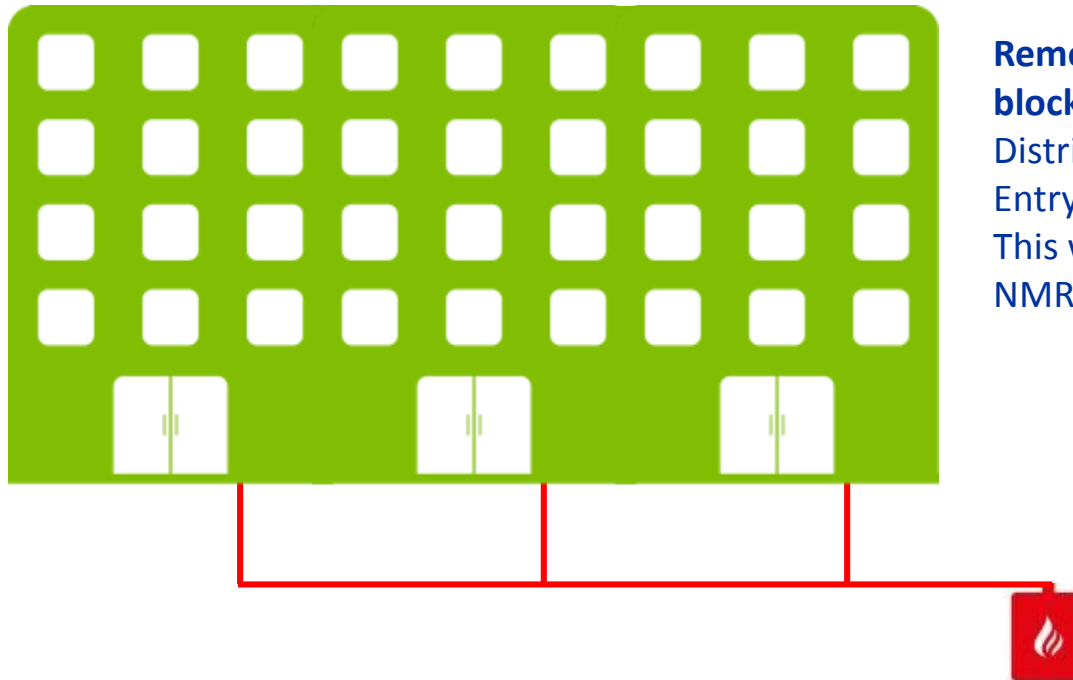
Remote Plant room serving one block.

Community Heat Network – no requirement for Point of Entry Meter.

As long as there is not heating in the Plant room

NMRO 09/06/2015

Question: Should there be any point of entry meters?



Remote Plant room serving one block.

District Heat Network – Point of Entry Meter required.

This will be viewed as 3 blocks.

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Question: Should there be any point of entry meters?

Remote Plant room serving individual semis or terraced houses
Community Heat Network – no requirement for Point of Entry Meter.
Terraces and semi detached houses considered individual units.
It should be noted that low rise deck access blocks would require point of entry meters.



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Billing



Credit billing

- Quality AMR systems
- Collect meter readings daily
- Bill monthly on the majority of schemes
- Budget payment plan available
- Web portal and electronic bills
- Plan to put consumption graphs on bills.

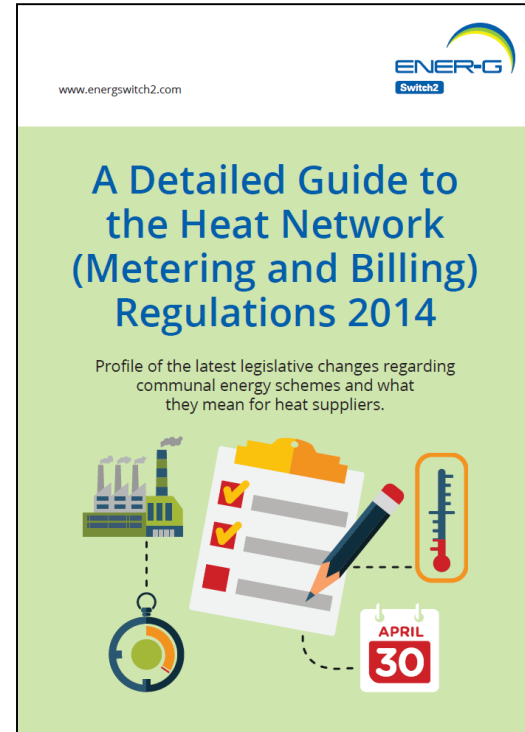


Pay-As-You-Go (PAYG)

- PAYG is now convenient
- Auto top-up
- Prevents debt
- In-home display
- Collect reads daily
- Option of issuing paper statement once a year to summarise consumption and costs.

Guide and resources

- Updates to regulations
- Materials
- Resource hub



Summary



Regulations positive and reinforce best practice



Planned approach to introducing metering



Consider PAYG

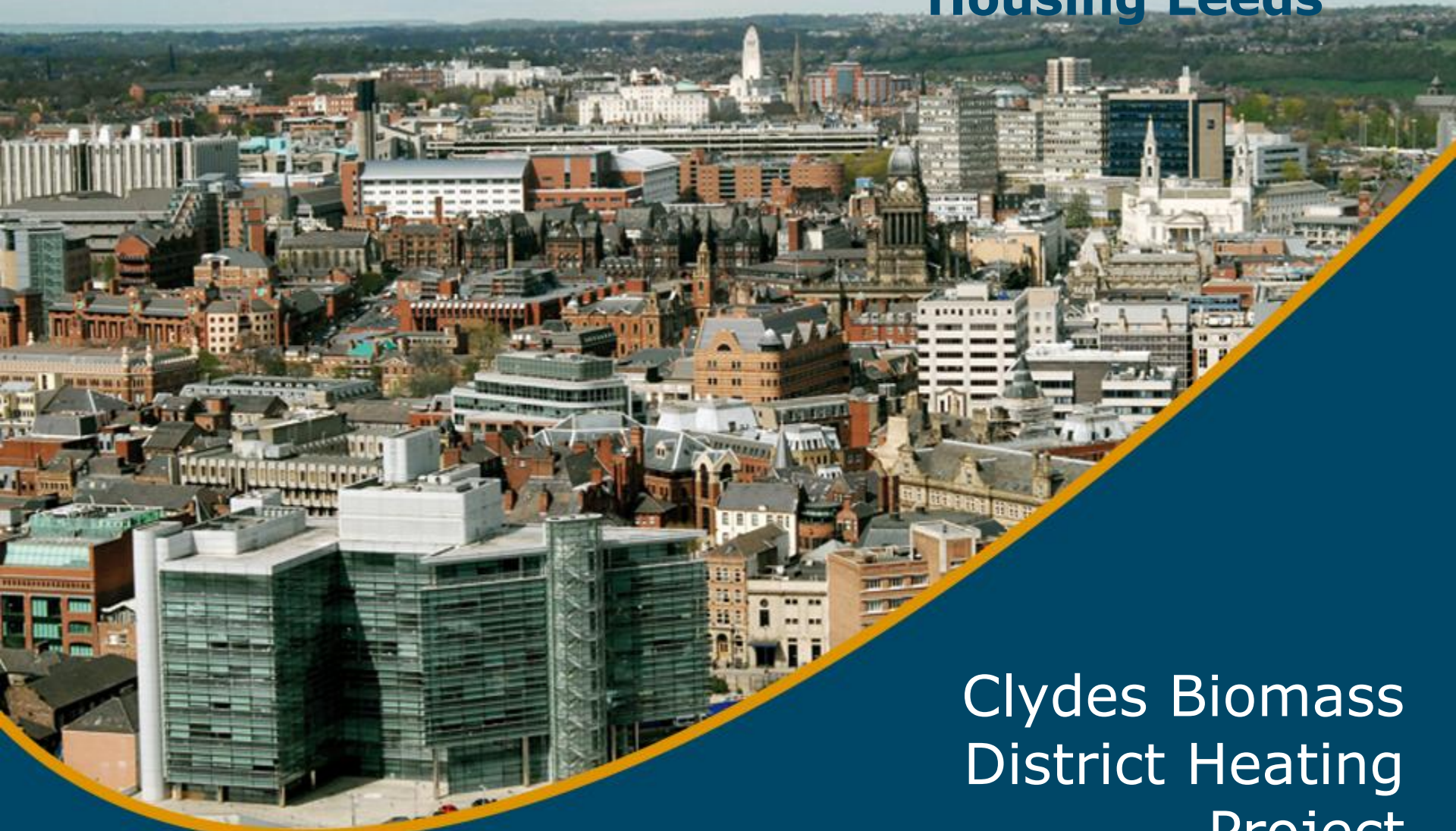


Putting the resident first



Benefits everyone

Jon Andrews
Project Manager
Housing Leeds



Clydes Biomass
District Heating
Project

Scope

- Why we decided to invest in a district heating project
- What are we delivering
- How the project is being funded
- Costs
- What benefits will the district heating system bring upon completion
- What challenges have been faced during the project
- What lessons have been learned to use for future projects

Why? - the Project Links to Leeds City Council Policy

- The Vision for Leeds 2011 to 2030 acknowledges that climate change is one of the three major challenges that have emerged since the last Vision was published in 2004 and has a specific aim to ensure that 'all homes are of a decent standard and everyone can afford to stay warm'.
- The Vision is supported by the City Priority Plan 2011 to 2015, which brings together a number of key four-year priorities that will help us deliver the 2030 Vision. It is supported by five separate action plans that address the five key themes. Of these, two contain priorities which are directly relevant to this project:
 - **Best City....for business:**
 - Improve the environment through reduced carbon emissions
 - **Best City... to live:**
 - Maximise regeneration investment to increase housing choice and affordability within sustainable neighbourhoods.
 - Enable growth of the City whilst protecting the distinctive green character of the city
 - Improve housing conditions and energy efficiency

Carbon Reduction is a Breakthrough Project

- “Cutting Carbon in Leeds” has 7 aims. The Clydes Biomass project works directly towards 3:
 - Reduce fuel bills for all residents by promoting energy efficiency and encouraging households to switch suppliers
 - Make low carbon Leeds a reality by planning for a more sustainable future and setting a revised and improved carbon target for 2050
 - Deliver air quality improvements by transforming the Council’s fleet of vehicles and establishing a green transport infrastructure
 - Support economic development and create jobs in Leeds through investment in low carbon technologies and industries
 - Tackle fuel poverty. Delivering 4,000 home energy efficiency improvements for our most vulnerable people will improve health and save money
 - Increase energy security and deliver savings to residents and businesses by creating Leeds’ first district heating scheme by 2017. This could provide lower cost heating to over 2,000 households by 2020
 - Install solar panels on 1,000 council houses by the end of 2015 to generate free electricity for tenants

But what does that mean in 'Plain English'?????

- Leeds City Council will invest in projects that make sense!!!!
- We now use the follow criteria:
 - Reduces carbon emissions
 - Reduces fuel poverty
 - Has a sound business case

What is the Project

- The installation of a Biomass fuelled district heating system in the Clydes tower blocks and Phil May Court residential area

- The system will provide heat and hot water circa 240 dwellings
- Will replace ageing inefficient electrical heating E7 systems.
- Will provide on demand heating and hot water from a central Energy Centre



- **View of the Clydes tower blocks and Phil May Court**

Where is the project & why was the Clydes Chosen

□ The Clydes area was chosen for the project for a number of reasons:

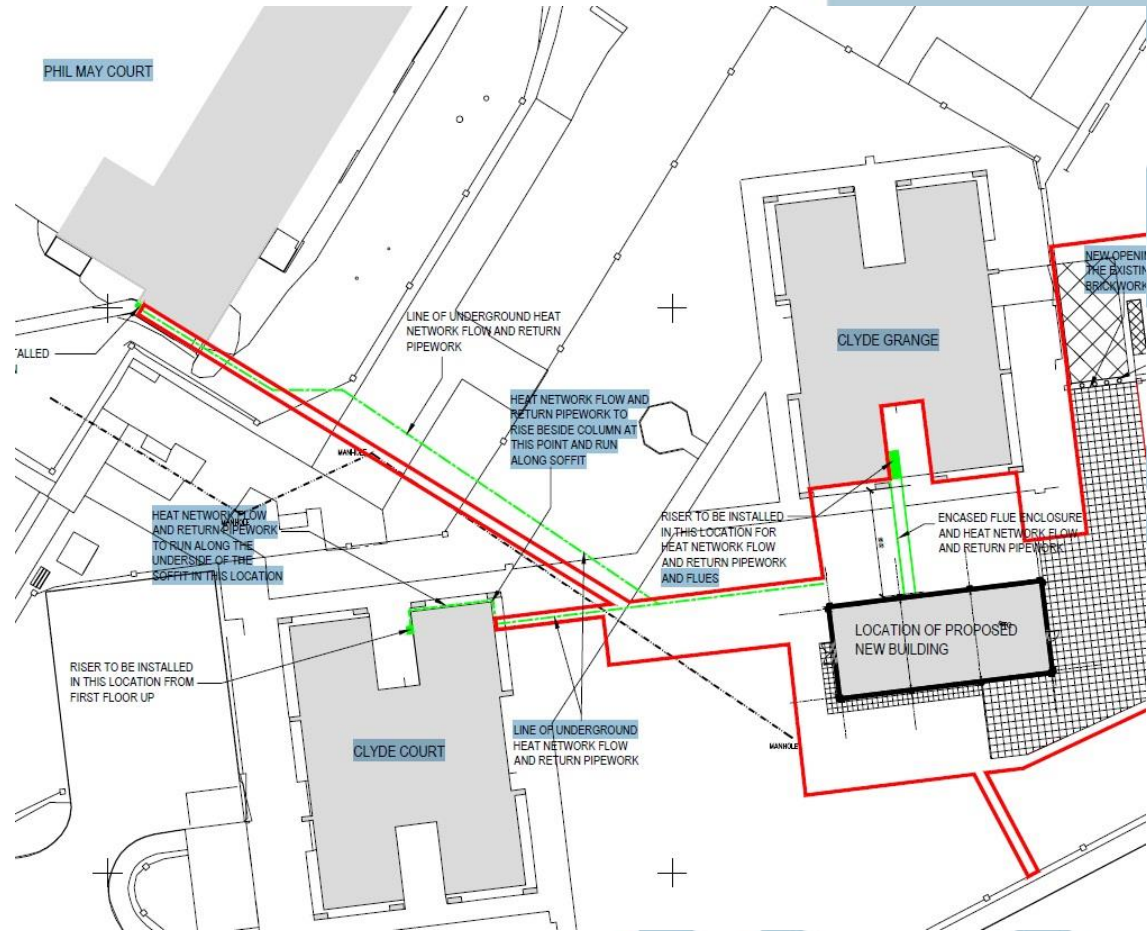
- The Clydes tower blocks and Phil May court reside in a CSCO, (Carbon Savings Community Obligation), area
- This places it in the 15% most deprived LSOA's, (Lower Layer Super Output Areas), in the country
- The current heating systems are electric E7 and expensive to run, this means a high level of fuel poverty is experienced in the area



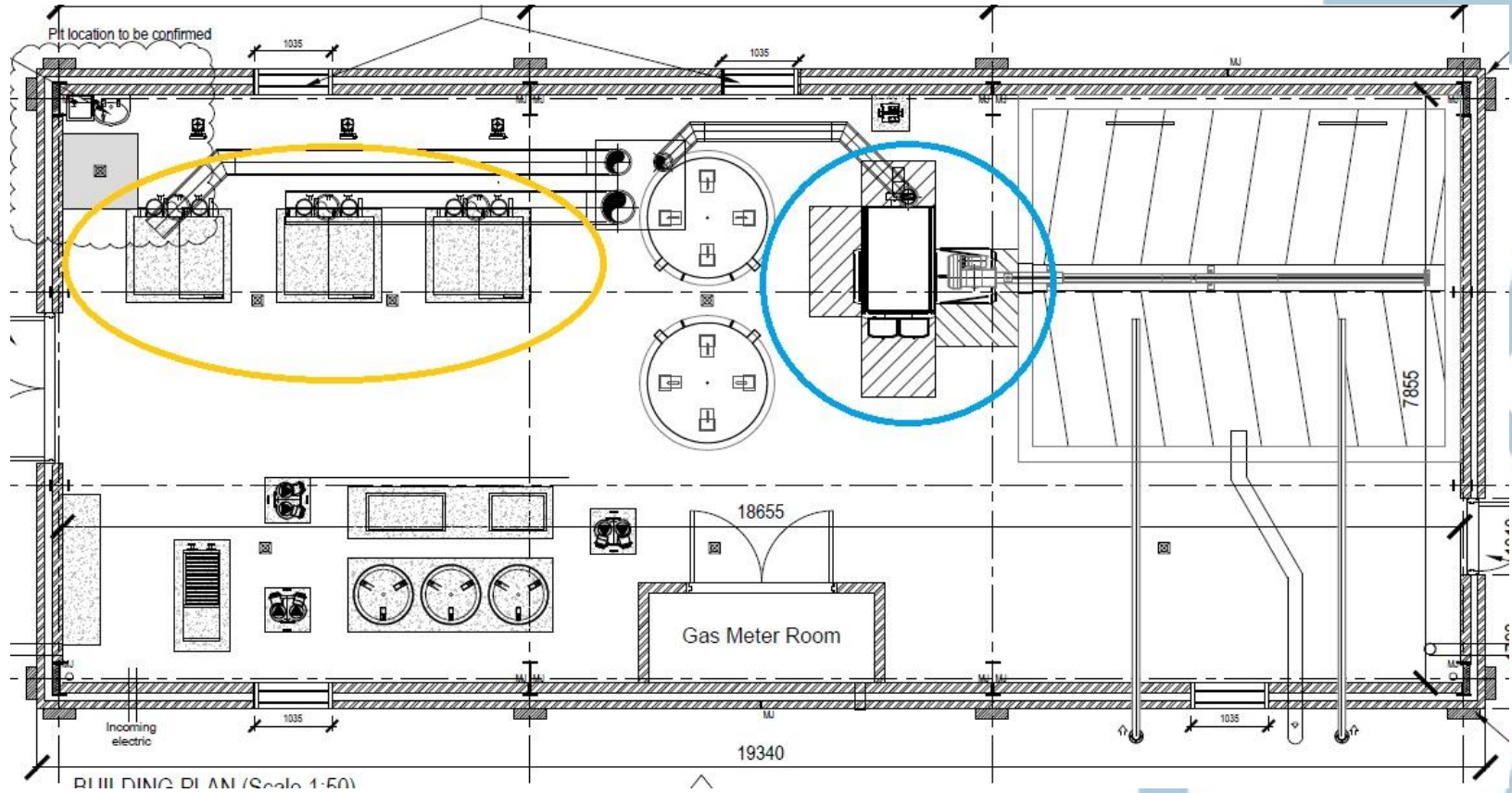
□ Phil May Court with the Clydes tower blocks in the background

What is Being Constructed for the Project

- The heating network will take the green route between the Energy Centre housing the boiler system to Clyde Grange, Clyde Court and Phil May Court
- The system will distribute hot water as needed throughout the network on demand with a constant reserve available



Energy Centre



- Floor plan of the energy center with biomass main boiler circled in blue, supporting gas fuelled boilers in orange

Equipment Mix

□ Two boiler types will be installed in the energy center:

- A primary 170kW rating wood chip Biomass boiler
- Three 500kW rated back up gas powered boilers for use in times of maintenance on main boiler and times of peak demand
- These three back up boilers also provide reliability should an unforeseen issue occur with the main unit

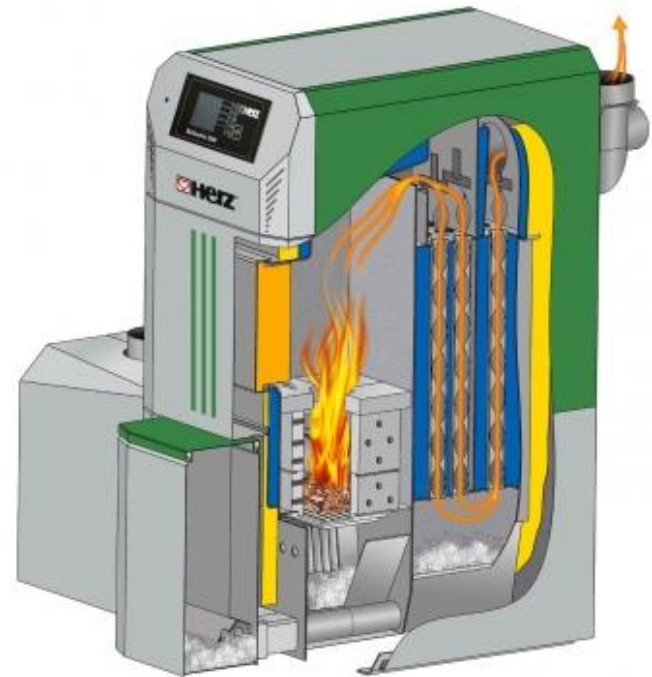


□ **An example of the type and look of the boiler to be installed, produced by Herz Energy of Austria**

Environmental and financial considerations

□ The Biomass boiler will be a Herz Firematic wood chip biomass boiler

- The boiler will be using ENplus Class A1 fuel, the highest quality wood pellet fuel producing the least ash and waste
- This leads to a more efficient burning process and more environmentally friendly operation
- The use of renewable fuel leads to receipt of RHI funding, enhancing the projects business case



□ A cutaway showing the pipework heat exchanger in the biomass boiler in blue and airflow in orange

Equipment in the dwellings

- Each dwelling will control its heating system via a HIU, (Heat Interface Unit), which contains a heat exchanger linked to the distribution network providing instantaneous hot water and heating on demand
- Each HIU contains a heat meter
- G6 prepayment unit



G6



Heat meter



Example HIU



HIU showing inner workings

Project Funding

- The project is being funded by a mixture of ERDF funding, (European Regional Development Fund), ECO funding, (Energy Companies Obligation), HRA of Leeds City Council, (Housing Revenue Account), and RHI, (Renewable Heat Incentive).
 - ERDF funding was awarded as part of the region wide big energy programme
 - The ECO grant is claimed upon completion by the contractor, energy companies will be legally obliged to provide extra financial support to make sure that hard to treat homes and lowest income and vulnerable households can benefit from energy efficiency measures
 - The cost to Leeds City Council is covered via the HRA Capital Programme
 - The RHI income will be received throughout the lifetime of the installation.

Project Scheduled Cost

Annual revenue costs and income		
Total income	£145,924	RHI (claimed quarterly) and monthly heat sales
Total O&M	£65,022	Fuel costs, billing, maintenance
Net annual operational surplus	£80,902	
20 year simple sum		
Costs	£1,383,847	
Operational surplus	£1,618,041	
Overall cost	-£234,194	Estimate to make a net surplus of c£234k over 20 years.

□ Projected Installation Costs

Superstructure	£133,273.70
Fuel store	£29,242.75
Biomass boiler	£169,939.00
gas boiler	£155,041.75
Thermal store (2,500 litre vessel) x2	£22,070.00
Biogas flue	£59,589.00
Gas boiler flues	£26,484.00
Heat exchanger	£11,586.75
Control panel	£82,762.50
Installation	£46,347.00
District Heating Network	£41,000.00
Plumbing, Alarms, HIU's, etc.	£1,786,000.00
Project Total Account	£2,563,336.45
Funding – ERDF	-£420,000.00
Funding - ECO	-£760,000.00
Total cost to LCC	£1,383,336.45

□ Projected Operational Costs

Benefits of the Project

□ Saves Carbon

- It is predicted that using the biomass boiler over existing system will save 692 tonnes of carbon dioxide each year
- The project will aid towards Leeds City Council achieving its goals of reducing carbon emissions to 40% of 1990 levels by 2022
- Improves LCC building stock by reducing overall carbon footprint

Benefits of the Project

□ Fuel poverty

- A lowering of fuel costs of approximately 10% per annum for residents, addressing fuel poverty in the area
- The removal of inefficient and hence more expensive existing residential heating systems
- A commitment to Leeds City Councils policy to residents that 'all homes are of a decent standard and everyone can afford to stay warm'.

Benefits of the Project

□ Business case

- Practical experience and knowledge gained by Leeds City Council in operating Biomass heating systems as an alternative in the future
- Potential generation of operational surplus energy to create a revenue stream for further projects for Leeds City Council
- Reduction of maintenance and repair costs of many individual systems by using one central energy centre, and cheaper and quicker maintenance access as plant is in a dedicated building, not in residents private dwellings
- Guaranteed revenue stream from RHI funding for the Council to reinvest in further projects

Key Challenges Faced

- The design and build contract has generated planning issues due to changes in the design through the initial project phases
- There is a steep learning curve as this is a new technology to Leeds City Council
- Tenant involvement and support had to be gathered to ensure a smooth process
- Short notice funding scheme changes can change the financial predictions and models



□ An aerial view of the project location from the south, the Clydes tower blocks in the foreground with Phil May Court to the north west

Key Lessons Learned

- Design, build and operate contracts can prove to be very useful
- Ensure you have adequate lead time for any changes in the project
- Ensures you have good proven technical support
- Ensure you have a strong project team to support all aspects of the project
- Keep track of funding scheme alterations consistently
- Efficient and clear communication between parties is key



□ Clyde Court and Clyde Grange in the background

Current Position

- The construction and installation phase is now underway, as the following examples show:



- **Foundations for the energy centre in the construction phase**



- **The flue system for the boiler gases is in place**

Current Position

- Further examples:



- **Energy Centre structural steelwork being erected**

Thank you

Any Questions?



Questions?

