

HNES M&R Guidance Document

The purpose of this document is to explain how the Heat Network Efficiency Scheme (HNES) Monitoring and Reporting (M&R) returns should be completed and submitted. For any questions relating to M&R returns, please email hnes@talan.com.

Online Portal

HNES Monitoring and Reporting takes place via the HNES online portal. You should have received a joining link and have access to the portal. There is a separate guidance document outlining how to use the portal which is available here: <https://hnes.uk/hnes-resources/>

An M&R Reports tab will appear on the online portal menu for funded projects. Clicking on this will take you to the M&R Reports dashboard, where you will see a list of M&R returns for the project showing the project details, type of form, reporting month and submission date. Click on the edit symbol at the right of the screen under Actions, to open the form to fill it in.

In the data tables, white cells are for data entry. Grey cells contain pre-filled data and are not editable. Dark grey cells do not apply and are also locked. The form does not save data automatically, so you are advised to save the data regularly.

Start of reporting and reporting deadlines

HNES funded projects must start completing M&R returns from the month in which they sign their Grant Funding Agreement (GFA) or Memorandum of Understanding (MoU).

The M&R forms will be available from around 7th of the month after the reporting month and must be submitted no later than the last working day of the month after the reporting month. For example, if an applicant signs their GFA/MoU in April 2026, their first M&R return will cover any activity undertaken in April and they will need to submit it by the last working day in May. Their next return will need to be submitted by the last working day in June and will cover any activity undertaken in May. Returns can be submitted before the end of the month if all the necessary information is available before then.

Revenue Optimisation Study Projects

Monthly Revenue Project Reporting

Revenue projects are required to fill in Section A, B and C on the HNES Monthly Revenue Monitoring and Reporting Form each month. This is for you to report on your project progress and milestones, the grant and match funding spend and risks affecting the project while the project is ongoing. The deadline for completing the form is the last working day of the month after the reporting month.

The Optimisation Study Outputs data in Section D is only filled once, after the Optimisation Study has been finalised. The Section D data should be provided/filled in by the consultant.

End of Revenue M&R Reporting

Once the Optimisation Study is complete, the Optimisation Study Report should be uploaded to the portal, and the Optimisation Study Outputs section of the form should be filled in with data provided by the consultant. This will then be the final M&R return for the project.

Capital Projects

Capital projects fill in **two separate forms** for monthly and quarterly M&R reporting.

Monthly Capital Project Reporting

Capital projects are required to fill in the HNES Monthly Capital Monitoring and Reporting Form each month while the project is ongoing. This is for you to report on your project progress and milestones, the grant and match funding spend and risks affecting the project while the project is ongoing. The deadline for completing the form is the last working day of the month after the reporting month.

End of Monthly Capital M&R Reporting

When the HNES project has completed its commissioning (when all HNES measures have been fully installed), Capital projects are no longer required to submit monthly M&R returns. However, the project will still need to submit the **quarterly M&R returns as outlined below for 24 months after commissioning**.

Quarterly Capital Project Reporting

Capital projects are required to fill in the HNES Quarterly Capital Monitoring and Reporting Form each quarter from the quarter in which they sign their GFA or MoU.

The quarterly reporting months are March, June, September and December, in each case covering the three months up to the reporting month, e.g. the March return covers January, February and March, the June return covers April, May and June, etc. In each case, the report is due by the last working day of the month after the reporting month, so the March return is due by the last working in April.

If the GFA/MoU is signed halfway through a quarter, only the months covered by the GFA/MoU need to be completed e.g. GFA/MoU signed in August, then only August and September need to be completed on the September return.

The data to be provided on the Quarterly return is similar to the annual baseline data entered on the application form, including fuel use, heat demands and losses, costs to the network operator and customer tariffs, and network outages. However, for Quarterly reporting, you must provide recent **monthly data for each of the previous three months – please ensure you are able to collect this data**.

End of Capital Quarterly M&R Reporting

Capital Quarterly M&R reporting continues from the signing of the GFA/MoU, throughout the installation of the HNES measures and **for 24 months after completion of commissioning**.

Monthly M&R forms – Capital and Revenue

Section A - Project Information

The **Project details** table shows the reporting month and project information, including the reference number, and is not editable.

Project details

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The next section covers the contact details of the person completing the form and the person with main responsibility for the project. The data is brought forward from the previous month to aid form filling, so please check it each month to ensure it is still correct and amend it if necessary.

 Monitoring form completed by

First name *

Last name *

Email address *

Telephone number *

 Project responsible officer

First name *

Last name *

Email address *

Telephone number *

The **Service providers** section asks for the names of the organisations involved in delivering the project and for managing the operation of the heat network. The delivery consultant will be particularly relevant for revenue grant projects, while the delivery contractor will mainly be relevant for capital grant projects. The data is brought forward from the previous month to aid form filling, so please ensure it is still correct and update if necessary.

Service providers

Project delivery consultant: organisation name (or N/A if not relevant) *

Enter text

Project principal delivery contractor for HNES works: organisation name *

Enter text

Project Metering & Billing contractor: organisation name (or N/A if not relevant) *

Enter text

The **Project Status** section is for reporting on the activities undertaken in the reporting month, activities expected in the following month and whether any changes have occurred since the last report, including any delays or other changes. This section should always be completed, even if it's just to say that no activity has been undertaken or no changes have occurred.

Project Status

 This section must be updated each month to show activity in the reporting month above and planned activity in the month after the reporting month

Project activity undertaken in reporting period (Max 300 words) *

A summary of the HNES activities undertaken/completed in the period covered by the current M&R return

Project activity planned for next reporting period (Max 300 words) *

A forward-look summary of the HNES activities that will be undertaken in the period covered by the next M&R return.

Adjustments to project delivery since the last reporting period (or N/A if not applicable) (Max 300 words) *

A summary of any adjustments to the project scope or programme since the previous reporting period that impact on delivery of the project's HNES funded measures.

The **Project Milestones** section is for projects to show the current timeframes expected for the project compared to the Milestone dates provided on the application form, shown in the left-hand column. Depending on the stage of the project, the dates to be entered will either be actual, to reflect when activities have been completed, or expected based on current project plans. Best estimate dates should always be provided for any future Milestones, even if they are likely to change as more information becomes available.

The first three dates are brought forward from the application form – please review these each month and update them if necessary. For Capital projects, the final two dates, and for Revenue projects, the final date, are not prefilled from the previous return and need to be filled in each month.

Please enter the date in the format of YYYY-MM-DD and outline the reason for any deviations in the Adjustments to project delivery box above. The Check sequential column checks if the dates are sequential and shows red warning text if not.

Project Milestones

Review your project plan each month and enter the latest actual and expected project milestone dates

A11:E11 fx

	A	B	C	D
1		Application milestone dates	Latest milestones YYYY-MM-DD	Check sequential
2	Procurement live			
3	Procurement complete			
4	Start of Optimisation Study			
5	Completion of Optimisation Study			

Revenue Return Milestones

Project Milestones

Review your project plan each month and enter the latest actual and expected project milestone dates

A11:E11 fx

	A	B	C	D
1		Application milestone dates	Latest milestones YYYY-MM-DD	Check sequential
2	Procurement live			
3	Procurement complete			
4	Start of construction / delivery			
5	Anticipated completion of installation			
6	Anticipated completion of commissioning			

Capital Return Milestones

In the **Supply chain information** section (**Capital projects only**), please enter the equipment that is being/has been procured in the tables provided (see example table below). This section covers:

- Dwelling-level heat meters
- Network-level heat metering
- Dwelling-level HIUs
- Network-level heat exchangers
- Metering & Billing software

If you are procuring any dwelling-level heat meters, please provide details

E1:E5		fx		
	A	B	C	D
1		Dwelling-level heat meters		
2		Manufacturer	Make/model	Number of units
3	Product 1			
4	Product 2			
5	Product 3			

Data is brought forward from the previous return. Please review this each month and add any additional equipment or equipment details as they become available.

Section B – Funding Status

The first table shows the the amount of grant awarded for each financial year and the match funding, where applicable, and the total project cost. These figures are prepopulated from the Grant Funding Agreement or Memorandum of Understanding and are not editable.

Pre-filled financial information from the Grant Funding Agreement / Memorandum of Understanding for reference

B13	fx	59000
	A	B
1		Grant awarded per financial year (£)
2	2023/24	0.00
3	2024/25	8000.00
4	2025/26	20000.00
5	2026/27	0.00
6	2027/28	0.00
7	2028/29	0.00
8	2029/30	0.00
11	Total Grant	28000.00
12	Total Match Funding	31000.00
13	Total Project Cost	59000.00

The **Grant Claims** section is for projects to provide an update on the grant spend profile of their project. Please fill in the white cells to show when grant claims were/will be made. Some cells are greyed-out where not applicable. The data entry cells move forward by one month each month according to the reporting month.

In the table **Grant claims made up to and including the reporting month** shown below, enter any grant claims that have already been made into the monthly cells. In this table, data will be brought forward from the previous month, so please check that it is correct. **The cell relating to the reporting month (which would have been shown in the forecast table the previous M&R return) will not be pre-filled, so projects must ensure that any grant claims made in the reporting month are entered.**

Grant Claims

Grant claims made up to and including the reporting month

Data is not brought forward from the previous return so projects should review their project plan each month and show when they expect to make any future grant claims. There is an additional question underneath this table for project to confirm that their figures are as accurate as possible. **Please ensure this grant forecast data is as accurate as possible as DESNZ use it for its financial forecasting.**

[illegible]

The Grant validation table checks the total grant entered overall in both grant claims tables for the financial year and in total against the grant awarded. It shows a warning message if the grant amount is too low, or an error message if the amount is too high.

Grant validation

G6	fx	=IF((B6-C6)<0,"Error",IF((B6-C6)>0,"Warning","OK"))		
	A	B	C	D
1		Grant awarded per FY (£)	Claimed and forecast grant entered above (£)	Validation
2	2023/24	45000	45000.00	OK
3	2024/25	20000	15000.00	Warning
4	2025/26	10000	12000.00	Error
5	2026/27	0	0.00	OK
6	2027/28	0	0.00	OK
7	2028/29	0	0.00	OK
8	2029/30	0	0.00	OK
9	Total grant	75000.00	72000.00	Warning
10	Validation colour key			
11	Error	The grant entered is greater than grant awarded		
12	Warning	The grant entered is lower than the grant awarded. This may indicate missing figures or an underspend. Please ensure all claimed/forecast grant has been entered and explain any underspend in the Funding Narrative section below		
13	OK	The grant entered matches the grant awarded		

The **Match Funding** section relates to spent and forecast match funding. All **Capital** projects are required to have match funding of more than 50% of the total project cost. **Revenue** projects are not required to have match funding, but if they do have any match funding, this should be shown in the tables below.

In this section, please provide an update on the match funding spend profile of the project by filling in the white cells to show when match funding was/will be spent. Some cells are greyed-out where not applicable. The data entry cells move forward by one month each month according to the reporting month.

In the table **Match funding spent to and including the reporting month** shown below, enter any match funding amounts that have already been spent into the relevant monthly cells. In this table, data will be brought forward from the previous month, so please check that it is correct. **The cell relating to the reporting month (which would have shown in the forecast table the previous M&R return) will not be pre-filled, so projects must ensure that any match funding spent in the reporting month is entered.**

Match Funding

Match funding spent up to and including the reporting month

	A	B	C	D	E	F	G	H	I	J	K	L	M
		2023/24											
		Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
1	FY 2023/24												
2	FY 2024/25												
3	FY 2025/26	0	0	0	0	0	0	0	0	0	0	0	0
4	FY 2026/27	0	0	0									
5	FY 2027/28												
6	FY 2028/29												
7	FY 2029/30												

In the **Match funding forecast** table below, projects should provide their best estimate of when they expect to spend the match funding in the future months. Data is not brought forward from the previous return so please review your project plan and provide best estimate figures.

Match funding forecast

	A	B	C	D	E	F	G	H	I	J	K	L	M
		Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
1	FY 2023/24												
2	FY 2024/25												
3	FY 2025/26												
4	FY 2026/27												
5	FY 2027/28	0	0	0	0	0	0	0	0	0	0	0	0
6	FY 2028/29	0	0	0	0	0	0	0	0	0	0	0	0
7	FY 2029/30	0	0	0	0	0	0	0	0	0	0	0	0

The **Match funding validation** table (**Capital projects only**) checks whether the total amount of match funding entered in both match funding tables is greater than the total amount of grant claims entered in the two grant claim tables (i.e. that the match funding is more than 50% of the total project cost).

Match funding validation

	A	B	C
1	Total grant entered	Total match funding entered	Validation
2	72000.00	75000.00	OK

In the **Funding Narrative** text box, please enter text to justify the grant and match funding figures entered and explain any variance compared to the funding award amounts from the GFA/MoU shown in the table at the start of Section B.

Funding Narrative

Supporting narrative to the grant and match funding values submitted, including (if relevant) explanation of any variance between the grant and match funding amounts entered here and the grant and match funding amounts from the GFA/MoU (Max 300 words)

Funding narrative text

0/2400 characters

If you anticipate any issue claiming the grant within the financial year for which it was awarded, or if you have an underspend or any other change to the project scope, please contact us at **hnes@talan.com** as soon as possible

Section C – Project Risk

In the **Risk Status** section, select the overall RAG risk status from the dropdown and explain why the RAG status was selected in the RAG rating narrative text box. This should be completed even if the RAG is Green, and particularly if the RAG status is Amber or above.

Risk Status

① Indicate the level of risk to the project using the Red-Amber-Green system: Green = project delivery on track; Amber-Green = project delivery likely; Amber = medium risk to project delivery; Amber-Red = medium/high risk to project delivery; Red = high risk to project delivery

Overall Project RAG
Select an option ▾

RAG Rating Explanation
Explain the RAG rating above (Max. 300 words)

0/2400 characters

In the **Project Risk Register**, enter the risks that the project may face to its successful delivery. Projects must enter at least one risk and up to a maximum of five. Where fewer than five risks have been identified, an explanation as to why this is should be given in the RAG Rating explanation box above.

Please provide a description of the risk and select the Risk group / category. The risk groups (e.g. Technical, Stakeholder, etc) and risk categories (e.g. Pipework, Access) have been combined into one dropdown (e.g. Delivery – Supply Chain) so please scroll through the dropdown list and select the relevant group / category.

Enter the Impact and Likelihood before mitigation by selecting from the dropdown options. The Risk rating is calculated automatically based on the selections entered for Impact and Likelihood. An explanation of any mitigating actions should then be provided along with confirmation of whether these actions have been implemented. Enter the residual impact and likelihood following the mitigating actions. The residual risk rating is calculated automatically. The residual risk rating after mitigation must not be higher than the original risk rating above – it can be lower or the same. The **Reduction in risk rating following mitigation** row is calculated automatically and checks that the residual risk rating is the same or lower than the initial risk rating.

The risk descriptions and mitigation information are carried over from the previous return and should be reviewed and updated each month to ensure they remain relevant to the project.

Please note that the Impact and Likelihood and Residual Impact and Likelihood are not carried forward and need to be assessed and entered each month.

J1:J12		fx					
	A	B	C	D	E	F	
1		Risk 1	Risk 2	Risk 3	Risk 4	Risk 5	
2	Risk description						
3	Risk group / risk category						
4	Impact						
5	Likelihood						
6	Risk rating						
7	Proposed risk mitigation description						
8	Mitigation in place?						
9	Residual impact						
10	Residual likelihood						
11	Residual risk rating						
12	Reduction in risk rating following mitigation						

For Capital projects, this is the end of the monthly M&R form. To submit the return, you will need to make the **Declaration** and enter “Confirm” to in the **Confirm Form Completed** section to show that you understand you have finalised the form as it is not possible to amend the form once it is submitted.

Revenue form only: Section D – Optimisation Study Outputs

Section D is filled in once, after the Optimisation Study has been completed. The consultant that carried out the Optimisation Study should fill it in or provide the data.

The Optimisation Study identifies Work Packages to improve the heat network. Each Work Package should be able to become a capital application on its own, rather than relating to individual measures that the heat network operator would need to bundle together themselves.

HNES expects a minimum of three Work Packages to be proposed, covering a Low, Medium and High scenario. These scenarios are likely to be cost based, but don't necessarily need to be.

The baseline column is prefilled from the application form and is not editable. If a new baseline has been identified during the Optimisation Study, please provide an explanation and enter the "Revised Baseline" column in the tables below.

Section D - Optimisation Study Outputs

This section is to be completed once after completion of the Optimisation Study, upon submission of the final Optimisation Study report

Has the Optimisation Study report been completed? *

Yes

This field is required

Work Packages

Is the baseline identified during the Optimisation Study different from the baseline provided on the application form?

Yes

Please give the reasons for the variations between the application form baseline and the Optimisation Study baseline

Enter paragraph

Enter the number of Work Packages identified and fill in the relevant number of columns. Data should be entered in all rows containing baseline data, and any other data identified during the Optimisation Study should also be entered. The figures entered in each Work Package column should always be compared against the baseline figures, not against other Work Packages.

Through discussions with the heat network operator, a preferred route forward should be identified and entered in Row 9 of the **Work Package Details** table. "Yes" should be entered for the preferred Work Packages, with "No" entered for all the others.

The layout of Section D is shown below:

1 If a new baseline has been identified, please enter this in the Revised Baseline columns below

Number of work packages assessed

Enter number

1 Enter data relating to the work packages assessed in all rows that contain data in the Baseline column and any other relevant data identified during the Optimisation Study

Work Package Details

N1.N9	fx	A	B	C	D	E	F	G	H	I	J	K	L
1			Baseline	Revised Baseline	Work Package 1	Work Package 2	Work Package 3	Work Package 4	Work Package 5	Work Package 6	Work Package 7	Work Package 8	Work Package 9
2		Description of Work Package											
3		Cost of work package (£)											
4		Simple payback of work package (Years)											
5		IRR 20 YEAR (%)											
6		IRR 40 YEAR (%)											
7		NPV 20 YEAR (£)											
8		NPV 40 YEAR (£)											
9		Client preferred work package for potential implementation											

Heat Demand

N2	fx	#application D-Baseline_6.B2	A	B	C	D	E	F	G	H	I	J	K	L
1				Baseline	Revised Baseline	Work Package 1	Work Package 2	Work Package 3	Work Package 4	Work Package 5	Work Package 6	Work Package 7	Work Package 8	Work Package 9
2		Number of residential connections												
3		Total residential heat demand												
4		Number of commercial connections												
5		Total commercial heat demand												

Network Imported Fuel

N11	fx	A	B	C	D	E	F	G	H	I	J	K	L
1			Baseline	Revised Baseline	Work Package 1	Work Package 2	Work Package 3	Work Package 4	Work Package 5	Work Package 6	Work Package 7	Work Package 8	Work Package 9
2		Natural gas (kWh/Year)											
3		Biofuel											
4		Biomass											
5		Electricity - national grid (kWh/Year)											
6		Electricity - self-supply renewable (kWh/Year)											
7		LPG (kWh/Year)											
8		Solar thermal (kWh/Year)											
9		Waste heat (kWh/Year)											
10		If Waste heat - what is the source of the waste heat											
11		Other fuel (kWh/Year)											
12		If other fuel: description of fuel type											

Network Energy Generation

O7	fx	A	B	C	D	E	F	G	H	I	J	K	L
1			Baseline	Revised baseline	Work Package 1	Work Package 2	Work Package 3	Work Package 4	Work Package 5	Work Package 6	Work Package 7	Work Package 8	Work Package 9
2		Network heat generated at energy centre (kWh/Year)											
3		Network pumping consumption (kWh/Year)											
4		Network primary flow temperature (degrees C)											
5		Network primary return temperature (degrees C)											
6		Network secondary flow temperature (degrees C)											
7		Network secondary return temperature (degrees C)											

Efficiency and Losses

P4	fx	A	B	C	D	E	F	G	H	I	J	K	L
1			Baseline	Revised Baseline	Work Package 1	Work Package 2	Work Package 3	Work Package 4	Work Package 5	Work Package 6	Work Package 7	Work Package 8	Work Package 9
2		Network efficiency (heat delivered to end users (kWh) / energy into energy centre (kWh)) (%)	VALUE										
3		Network efficiency (heat delivered to end users (kWh) / heat generated (kWh)) (%)	VALUE										
4		Network losses (primary) (kWh/Year)											
5		Network losses (secondary) (kWh/Year)											
6		Network losses (secondary) (Widwelling)											

Economic Indicators

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Network Outages / Service Interruptions

On the left-hand side of the interruptions													
N1fx													
	A	B	C	D	E	F	G	H	I	J	K		
1		Baseline	Revised Baseline	Work Package 1	Work Package 2	Work Package 3	Work Package 4	Work Package 5	Work Package 6	Work Package 7	Work Package 8	Work Package 9	Work Package 10
2	Number of Unplanned Interruptions to heat supply (per Year)												
3	Number of Unplanned Interruptions to heat supply longer than 24 hours (per Year)												
4	Number of Unplanned Interruptions to heat supply affecting more than 25% of the customer base (per Year)												
5	Number of Unplanned Interruptions to heat supply affecting the whole network (per Year)												
6	Number of Unplanned Interruptions to heat supply affecting bulk supply (block level) (per Year)												

Supply chain information

Based on your Optimisation Study are you likely to install any of the following equipment? Select all that apply

	Yes/No	Makes/models (if known)	Number (if known)
Dwelling-level heat meters	Select option		
Network-level heat meters	Select option		
Dwelling-level HIUs	Select option		
Network-level heat exchangers	Select option		
Metering & Billing software/hardware	Select option		

To submit the Revenue return, you will need to make the **Declaration** and enter “Confirm” into the **Confirm Form Completed** section to show that you understand you have finalised the form as it is not possible to amend the form once it is submitted.

Capital Quarterly Monitoring and Reporting Form

This form needs to be completed by Capital projects every quarter from the month the GFA/MoU is signed until 24 months after the HNES project works are commissioned. This is to allow us to assess the impact the installed measures are having on the various baseline targets provided at the application stage. This allows HNES to understand whether the anticipated benefits outlined in the application form have been realised once the project is fully commissioned. Depending on the project, some improvements may be realised as the project progresses, however for other projects, savings may only be seen once the project is finished. Regardless, this form needs to be completed every quarter starting from the month the GFA/MoU is signed.

The baseline and target values in the tables below are prepopulated from the data entered on the application form and are not editable. Projects must provide **monthly figures in the white cells in all rows where baseline data was provided** in the application form, to enable HNES to understand if these benefits are being realised. However, projects can also enter additional data in other rows if they wish.

The **Validation** column checks that data has been entered in rows with data in the baseline column. The **Revised baseline** and **Revised target** columns are for use by HNES to record any agreed changes to the baseline in the event of a project change agreed by DESNZ.

Please ensure any factors affecting the data (e.g. any heating plant or meter issues, additional dwellings on the network, etc) are explained in the text box at the bottom of the form and show the effect on the heat demand.

To enable the savings to be measured after the project has been fully commissioned, **capital projects are required to complete this tab every quarter for 24 months following their commissioning date.**

A technical guide to completing the Capital Tab C Data Sheet is provided below as an addendum to this guidance document.

The layout of the form is shown below:

Network Energy Generation

I15	fx	[For HNES team use only]								
	A	B	C	D	E	F	G	H	I	J
1	Network Imported Fuel	[For HNES team use only]								
2		Baseline (annual)	Target (annual)	Apr-26	May-26	Jun-26	Data Source (Select)	Validation	Revised baseline	Revised target
3	Natural gas (kWh)									
4	Biofuel (kWh)									
5	Biomass (kWh)									
6	Electricity - national grid (kWh)									
7	Electricity - self-supply renewable (kWh)									
8	LPG (kWh)									
9	Solar thermal (kWh)									
10	Waste heat (kWh)									
11	If Waste heat - what is the source of the waste heat									
12	Other fuel (kWh)									
13	If other fuel - description of fuel type									
15	Heating Plant	[For HNES team use only]								
16		Baseline (annual)	Target (annual)	Apr-26	May-26		Data Source (Select)	Validation	Revised baseline	Revised target
17	Primary heating plant technology									
18	If other selected, provide a description of the technology or heat source									
19	Primary heating plant fuel									
20	Primary heating plant number of units installed									
21	Primary heating plant total thermal capacity (kWth)									
22	Primary heating plant thermal output (kWh)									
23										
24	Other heating plant (1) technology									
25	If other selected, provide a description of the technology or heat source									
26	Other heating plant (1) fuel									
27	Other heating plant (1) number of units installed									
28	Other heating plant (1) thermal capacity (kWth)									
29	Other heating plant (1) thermal output (kWh)									
30										
31	Other heating plant (2) technology									
32	If other selected, provide a description of the technology or heat source									
33	Other heating plant (2) fuel									
34	Other heating plant (2) number of units installed									
35	Other heating plant (2) thermal capacity (kWth)									
36	Other heating plant (2) thermal output (kWh)									
37										
38	Total heat exiting energy centre / plant room (kWh)									

Economic Indicators

Cost to Network Operator

I19	fx								
	A	B	C	D	E	F	G	H	I
1	Cost to Network Operator							[For HNES team use only]	
2		Baseline (annual)	Target (annual)	=D25&C25	=E25&C25		Validation	Revised baseline	Revised target
3	Cost to network operator of natural gas purchase (p/kWh)								
4	Cost to network operator of biofuel purchase (p/kWh)								
5	Cost to network operator of biomass purchase (£/tonne)								
6	Cost to network operator of electricity import (national grid) (p/kWh)								
7	Cost to network operator of electricity generation (self-supply renewable) (p/kWh)								
8	Cost to network operator of LPG purchase (p/kWh)								
9	Solar thermal (p/kWh)								
10	Cost to network operator of waste heat purchase (p/kWh)								
11	Cost to network operator of other fuel purchase (p/kWh)								
12	Cost of delivered heat is the cost to the network operator per kWh of heat delivered to end customers, reflecting all input fuel costs, operation & maintenance costs (e.g. metering and billing), and accounting for generation/storage losses and distribution losses. On-costs such as administration, insurance, rents etc should be excluded.								
14	Cost to network operator of delivering heat to domestic end customer HIU (p/kWh)								
15	Cost to network operator of delivering heat to commercial end customer heat station/HIU (p/kWh)								
17	Describe how the domestic end customer heat tariff has been derived, or input N/A if no domestic connections								
18	Domestic end customer heat tariff (variable) (p/kWh)								
19	Domestic end customer heat tariff (fixed) (£ per day)								
20	Domestic end customer heat charge (annual - if not charged fixed or variable) (£/year)								
21	Describe how the commercial end customer heat tariff has been derived, or input N/A if no commercial connections								
22	Commercial end customer heat tariff (variable) (p/kWh)								
23	Commercial end customer heat tariff (fixed) (£ per day)								
24									

Network Outages/Service Interruptions

E11	fx	=IF(B11="Mar","Feb",IF(B11="Jun","May",IF(B11="Sep","Aug",IF(B11="Dec","Nov","Month 2"))))							
	A	B	C	D	E	F	G	H	I
1	Network Outages/Service Interruptions							[For HNES team use only]	
2		Baseline (annual)	Target (annual)	=D11&C11	=E11&C11		Validation	Revised baseline	Revised target
3	Number of Unplanned Interruptions to heat supply								
4	Number of Unplanned Interruptions to heat supply longer than 24 hours								
5	Number of Unplanned Interruptions to heat supply affecting more than 25% of the customer base								
6	Number of Unplanned Interruptions to heat supply affecting the whole network								
7	Number of Unplanned Interruptions to heat supply affecting bulk supply (block level)								
8	Number of Unplanned Interruptions to heat supply at an individual customer level (i.e. not network wide)								
9	Source of interruptions data								
10									

Have there been any changes to the work this quarter (outside the scope of HNES) that significantly impact heat demand? Please include incidents that temporarily affect heat demand as well as permanent or long-term changes. For example: significant change in customer numbers, efficiency improvements to dwellings, shutdown of main heating technology, etc.

Enter paragraph

Impact (Select)

Select an option

Declaration

I declare that all the information provided in this form is correct to the best of my knowledge *

Select an option

This field is required

Confirm Form Completed

Please type "Confirm" into the text box below to confirm you understand that once you press the "Submit" button you will no longer be able to make changes to this reporting form *

Enter text

This field is required

For any questions relating to M&R returns, please email hnes@talan.com.

Document Version History

Version	Issue Date	Changes from Previous Version
Version 1.0	25/08/2023	N/A
Version 1.1	21/09/2023	Further detail added to the Tab C Optimisation Study Outputs – Revenue Only section
Version 2.0	27/10/2023	Images and further guidance added to the different Tab sections
Version 2.1	20/11/2023	Reporting frequency and Submitting M&R returns sections updated to confirm returns should be uploaded into the folder relating to the reporting month, not the submission month
Version 3.0	09/08/2024	Blank templates uploaded to project SharePoint spaces, updated Funding Status dates and explanation
Version 3.1	20/01/2024	Capital Tab C Data Sheet Guidance Addendum added
Version 4.0		Submission via online portal, separate Capital Quarterly M&R form, online forms and screenshots and rebranding to Talan, UK Government and inclusion of Gleeds

HNES M&R Guidance Addendum: Capital Quarterly M&R Data Guidance

Introduction

This report provides guidance on how to fill in the data on the Quarterly Capital M&R returns. It outlines some key definitions and provides example calculations and estimation methods to assist projects when completing their returns.

Throughout this report the unit T is used to define the time period over which the network is being monitored. Where the calculation relates to a time period, this is normally a **month** for figures to be entered in columns I, J and K. In contrast, many of the baseline and target figures in columns E and F are **annual** so the figures are not directly comparable.

Network Imported Fuel

This information should be available either from the fuel supplier, through meters on plant room equipment, or from remotely logged data.

If this data is not able to be obtained accurately, then it could be calculated from the fuel bill. If it is known how much is being charged for fuel, and the rate which the supplier is charging, then the fuel consumption can be calculated as follows.

$$\text{Fuel consumption (kWh/T)} = \frac{\text{Cost of fuel (£/T)}}{\text{Rate (£/kWh)}}$$

Network Energy Generation

Primary Heating Plant Technology

The primary heating plant technology is the technology which produces the highest amount of heat in the plant room. If there are multiple different technologies in the plant room, then these can be inputted in the blocks below, starting “Other heating plant (1/2) technology”. If there is multiple of the same equipment with different thermal capacities, then similarly these can be inputted in the blocks below.

Thermal Capacity and Thermal Output

The thermal capacity of the equipment is the amount of heat energy it can produce in one hour, this is measured in kilowatts (kW). This is not the same as the thermal output, which is the total heat transferred over a given period of time, measured in kilowatt hours (kWh). The thermal capacity of the equipment is typically provided by

the manufacturer, this information should either be found within the user manual or on the specifications plate on the equipment.

The thermal output of the equipment may be able to be obtained accurately, typically through manual meter readings on the plant room equipment, or through remotely logged meter readings. If this information is not able to be obtained accurately then it can be estimated using assumed efficiencies and the fuel consumption. The designed efficiency of the equipment should be obtained from the manufacturer or through any documentation provided on purchase, where possible.

Table 1 contains typical efficiencies for some common plant room equipment and is only provided for guidance if no other information is available.

Equipment	Thermal Efficiency
Gas boiler	85%
Electric boiler	99%
Biomass boiler	80%
CHP	50%
Air Source Heat Pump	350%
Ground Source Heat Pump	400%

Table 1 – Typical thermal efficiencies of common plant room equipment.

The thermal output can be estimated by multiplying fuel consumption by the assumed efficiency, as seen below.

$$\text{Thermal output (kWh/T)} = \text{Fuel consumption (kWh/T)} \times \text{Efficiency (\%)}$$

Heat Exiting Plant Room and Plant Room Heat Losses

The total heat exiting the energy centre could be accurately read from a meter within the plant room or taken from remotely logged data. If accurate information is not available, then this could be estimated by summing the thermal output of the heat generation equipment, although this would exclude any heat losses within the plant room.

Plant room heat losses should be calculated by looking at the difference between the sum of the thermal outputs of the heat generation equipment, and the heat exiting the plant room.

Plant room heat losses (kWh/T)

$$= \text{Total heat exiting plant room (kWh/T)} - \sum [\text{Heating equipment thermal output (kWh/T)}]$$

Thermal Store

The plant room might contain a thermal store, a water tank used to store heat. The size of the store could be found on a specification plate attached to the equipment, in any documentation provided when the store was purchased, or if the serial number is known, the manufacturer could be contacted.

Pumping Energy

The pumping energy could be obtained accurately by reading from energy meters on the plant room equipment, or if the equipment is connected to a BMS, readings could be extracted.

The flow and return temperatures from the plant room could either be accurately read from heat meters within the plant room or taken from remotely logged data. If metering is not present, then these could be estimated from the design specification.

Heat Demands and Losses

It is first important to understand if the system is a district heating system or a communal heating system. A communal heating system is a network which serves a single building or small complex of buildings, typically supplied from a centralised plant room, serving individual dwellings. A district heat network would serve a larger number of buildings, typically a central plant would deliver heat to substations within individual buildings, transferring heat to a secondary network. Please read the section relevant to the network below.

District Network

Heat Delivered to Bulk Heat Stations

The first required value in this section is the heat delivered to bulk residential/commercial heat stations/HIUs. This is the amount of heat delivered to individual residential or commercial building substations, not to individual dwellings. This could be accurately read from a heat meter within the building substation, or from remotely logged data. If accurate data is not available, then these can be estimated using the heat loss methodology shown in the section, Heat Losses Estimation.

$$\begin{aligned}
& \text{Heat delivered to bulk residential/commercial heat stations (kWh/T)} \\
& = \text{Total heat exiting plant room (kWh/T)} \\
& - \text{Estimated Primary/Secondary network heat losses (kWh/T)}
\end{aligned}$$

Primary Network Losses

The primary network is the pipes that carry heat from the central plant room to the individual building substations. The primary network losses can be found accurately from the difference in heat exiting the plant room and the sum of heat delivered to the individual residential and commercial heat stations.

$$\begin{aligned}
& \text{Primary network heat loss (kWh/T)} \\
& = \text{Total heat exiting plant room (kWh/T)} \\
& - \text{Total heat delivered to bulk residential/commercial heat stations (kWh/T)}
\end{aligned}$$

Heat Delivered to Residential Demands

The heat delivered to residential demands is the value for the total amount of heat delivered to all dwellings on the network. This can be found by summing manual readings from heat meters within each dwelling or taken from remotely logged data. If this data cannot be obtained accurately then it can be calculated by subtracting estimated secondary network heat losses, shown in the section Heat Losses Estimation, from the heat delivered to the residential heat stations.

$$\begin{aligned}
& \text{Heat delivered to residential demands (kWh/T)} \\
& = \text{Heat delivered to residential heat stations (kWh/T)} \\
& - \text{Estimated secondary heat network losses (kWh/T)}
\end{aligned}$$

Secondary Network Heat Losses

Secondary network heat losses can be calculated accurately by subtracting the total heat delivered to residential demands from the total heat exiting the energy centre.

$$\begin{aligned}
& \text{Secondary network heat losses (kWh/T)} \\
& = \text{Total heat exiting the plant room (kWh/T)} - \text{Heat delivered to residential demands (kWh/T)}
\end{aligned}$$

Secondary heat losses per dwelling can be calculated by multiplying the secondary network heat losses by 1000 and then dividing by the total number of hours in the time period being monitored, h, and dividing again by the number of dwellings connected to the network.

$$\begin{aligned}
& \text{Secondary network heat losses (W/dwelling)} \\
& = [\{\text{Secondary network heat losses (kWh/T)} \times 1000\}] \div h \div \text{number of dwellings}
\end{aligned}$$

The flow and return temperatures from the plant room could either be accurately read from heat meters within the building substation or taken from remotely logged data. If metering is not present, then these could be estimated from the design specification.

Communal Network

Unlike a district heat network, a communal heat network does not contain any primary network pipework so less information is required.

Heat Delivered to Residential Demands

The heat delivered to residential demands is the value for the total amount of heat delivered to all dwellings on the network. This can be found by summing manual readings from heat meters within each dwelling or taken from remotely logged data. If this data cannot be obtained accurately then it can be calculated by subtracting estimated secondary network heat losses, shown in the section Heat Losses Estimation, from the heat delivered to the residential heat stations.

$$\begin{aligned} \text{Heat delivered to residential demands (kWh/T)} \\ &= \text{Heat delivered to residential heat stations (kWh/T)} \\ &\quad - \text{Estimated secondary heat network losses (kWh/T)} \end{aligned}$$

Secondary Network Heat Losses

Secondary network heat losses can be calculated accurately by subtracting the total heat delivered to residential demands from the total heat exiting the energy centre.

$$\begin{aligned} \text{Secondary network heat losses (kWh/T)} \\ &= \text{Total heat exiting the plant room (kWh/T)} - \text{Heat delivered to residential demands (kWh/T)} \end{aligned}$$

Secondary heat losses per dwelling can be calculated by multiplying the secondary network heat losses by 1000 and then dividing by the total number of hours in the time period being monitored, h , before dividing again by the number of dwellings connected to the network.

$$\begin{aligned} \text{Secondary network heat losses (W/dwelling)} \\ &= [\text{Secondary network heat losses (kWh/T)} \times 1000] \div h \div \text{number of dwellings} \end{aligned}$$

Heat Losses Estimation

If primary and secondary heat losses are not known, then they can be estimated based on pipework lengths and diameters estimated from the dimensions of the building / size of the plot and a nominal allowance for a low level of insulation if insulation is not known.

The heat loss, kW, can then be multiplied by the running time to give, kWh, under the assumption of a 24/7/365 operation.

Table 2 contains typical pipe heat losses based upon pipe diameter and insulation thickness. Please note that these values are for pre-insulated steel pipes from a specific manufacturer, and it would be more accurate to obtain information specific to the network

from manufacturers data catalogues based on the pipe material that has been most likely installed in your site i.e. plastic, pre-insulated steel.

	Pipe Heat losses (W/m)			
	Insulation thickness			
DN	series 1	series 2	series 3	series 4
25	28.2	38.2	45.7	53.2
32	33.8	41.3	48.8	58.8
40	30.9	38.4	45.9	55.9
50	32.4	39.9	49.9	59.9
65	32.0	42.0	52.0	62.0
80	35.6	45.6	55.6	68.1
100	42.9	55.4	67.9	82.9
125	42.7	55.2	70.2	87.7
150	40.9	55.9	73.4	93.4
200	48.0	68.0	90.5	115.5
250	63.5	88.5	113.5	143.5
300	63.1	88.1	118.1	153.1
350	72.2	102.2	137.2	177.2
400	76.8	111.8	151.8	196.8
450	51.5	86.5	126.5	171.5
500	61.0	101.0	146.0	196.0
600	50.0	95.0	145.0	195.0
700	44.5	94.5	144.5	194.5
800	43.5	93.5	143.5	143.5
900	43.0	93.0	93.0	93.0

Table 2 - A table of typical heat losses based upon pipe diameter and insulation thickness.

The following equation can be used to calculate total heat losses. If multiple pipe diameters are present, repeat this calculation using all pipe diameters and then sum the results. Where L is the length of the pipe for the diameter of the pipe which the heat losses are being calculated for. Where h, is the number of hours in time, T.

$$\text{Estimated Primary/Secondary network heat losses (kWh/T)} = \text{Pipe heat losses (kW/m)} \times L \times h$$

Economic Indicators

The cost of purchase of the fuel in p/kWh should be known to the network operator through their internal commercial team. If this is not known, then the fuel supplier should be contacted.

The cost to the operator for delivering heat to the domestic end customer should represent all input fuel costs, as well as any operational and maintenance costs.

On-costs such as administration, insurance, rent, etc should be excluded.

All customer end heat tariffs should be known to the operator through their commercial team or sustainability/ energy manager.

Network Outages / Service Interruptions

This information might be logged by a BMS, if this information is not automatically logged, then the operator might have manual logs of this information. This information might also be known by the maintenance contractor. The source for the information about services interruptions should be stated at the bottom of this section.