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# Gas PAYG Meter System Replacement Project

## Consultation on the High-Level Design

### Consultation Paper

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## Executive Summary

The CRU is inviting feedback from suppliers, industry groups, customer interest groups, members of the public and all other interested parties on the High-Level Design for the Gas Pay-As-You-Go (PAYG) System Replacement Project presented in this paper.

The current gas PAYG meters are coming to the end of their life due to ageing and must be replaced. Severe weather events and the COVID-19 pandemic also illustrated the limitations of the current system including the inability of customers to top up remotely and difficulties in increasing emergency credit.

In 2023, a CRU decision was made not to progress with the Smart Metering programme for gas customers but was noted at the time this may be reviewed again in the future. The CRU subsequently instructed Gas Networks Ireland (GNI) to commence the planning and design for a new PAYG solution for prepayment gas customers. In response, GNI set-up a working group that includes PAYG gas suppliers and have been working with them to plan and design a new PAYG meter solution.

The customer's credit balance will no longer be stored and updated on the meter (as happens with the current meter), but it will be stored remotely by the supplier and updated once per day. The change in the mechanics of the infrastructure will mean that customers may receive low balance alerts from their suppliers through other agreed channels such as a web portal or mobile application, if they wish. Similarly, disconnection and reconnection will not be performed by the meter but remotely by the supplier and so the new gas meter system will require reliable cellular network signal. The change in infrastructure will also mean that the customer's balance will no longer be displayed on the meter but will be available through other channels such as a web portal or mobile application provided by their supplier.

The new gas prepayment meters will not only ensure the continuation of a Pay-As-You-Go service for gas customers but will also enable these customers to top-up online as well as in a retail outlet. Without this replacement project, the current meters will become obsolete and a gas prepayment meter option will no longer be an option for customers. The new meter system will be the best available solution for customers and will be compatible with hydrogen blends up to 20%. The new gas PAYG system will be fundamentally different in some respects from the existing prepayment solutions.

Some of these changes will require changes to policy and the responses to this consultation, as well as the future consultation on the more detailed features of the new system, will feed into a new gas PAYG policy.

The rollout of the new meters is expected to begin in 2027 and will take approximately 3-4 years for the 112,000 PAYG gas customer meters to be replaced.

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# 1. Introduction

## 1.1 Background

### 1.1.1 Context

In July 2012, the CRU published its decision to roll out electricity and gas smart meters for all residential and small business customers. The National Smart Metering Programme (NSMP) was originally a plan to upgrade how electricity and gas retail markets operate, in order to improve levels of service for all customers. This involves replacing mechanical meters with new digital meters which offer customers a range of new functions and services. The CRU concluded the High-Level Design for the NSMP in October 2014<sup>1</sup>. The rollout of smart meters for electricity customers began in 2019 and is estimated to be completed by 2025.

In 2022 the CRU received a submission from Gas Networks Ireland (GNI) in which GNI did not recommend investing in a mass smart meter deployment project for gas customers. Based on the content of the submission, the CRU was not confident that the rollout of gas smart meters would deliver sufficient benefits to gas customers considering the significant costs it would incur. However this decision may be revisited in the future at a point in time when the CRU is provided with sufficient information regarding the benefits of smart metering for gas customers and in line with EU legislation.

Nevertheless, in recent years it has become evident that the current gas PAYG meter system must be replaced. Firstly, during extreme weather events and the Covid-19 pandemic whereby travelling to a nearby retail outlet to buy top-up credit had become more difficult for customers, it became evident that an online top-up option would be necessary going forward. Secondly, during the recent energy crisis, increasing emergency credit for PAYG customers became difficult as the current system has intermittent contact with Gas Network Irelands (GNI's) systems (the meter only receives and sends messages to GNI when a customer interacts with the meter for example, by topping-up). Thirdly, the current meter hardware supporting the PAYG system is ageing and approaching end of life.

Therefore, to ensure gas customers can continue to avail of prepayment services (both lifestyle and hardship), the meter system must be replaced.

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<sup>1</sup> [CER/14/046](#)

## **Gas PAYG Working Group**

In July 2023, GNI established a gas PAYG working group which includes gas suppliers and technical experts from GNI. So far, the working group have developed a set of High-Level Requirements and Design outlining the features the new PAYG system should have. This includes the customer experience features, the system architecture and the contractual frameworks that need to be put in place for a new GPAYG meter system. The working group and GNI have been meeting regularly carrying out research and meeting with meter vendors to assess the kinds of PAYG meters available on the market, In December 2023, the gas PAYG working group collaborated with GNI to prepare a PAYG Recommendations Report that was submitted to the CRU which set out the type of metering system they recommended to replace the current system. In April 2024, GNI and the working group also submitted a High-Level Design document which set out the features that should be included in the new system. This provided guidance for GNI's procurement process and set out the changes that would be required to the existing retail market design.

There are currently approximately 114,000 gas PAYG customers in Ireland and it is estimated that it will take 2-3 years to rollout the new meters beginning in 2027.

### **1.1.2 Related Documents**

- CER National Smart Metering Programme – Smart Metering High Level Design ([CER14/046](#))
- CER National Smart Metering Programme Rolling out New Services: Smart Pay As You Go ([CER15271](#))
- CER National Smart Metering Programme Rolling out New Services – Time of Use Tariffs and Smart Pay As You Go ([CER15136](#))
- Upgrade on the Smart Meter Upgrade ([CER17279](#))
- Smart Meter Upgrade – Consultation on Smart Pay-As-You-Go ([CRU21046](#))
- Electricity and Gas Suppliers' Handbook 2023 ([CRU202324](#))

Information on the CRU's role and relevant legislation can be found on the CRU's website at [www.cru.ie](http://www.cru.ie)

## 2. High Level Design

### Core Design

#### 1.1.4 Introduction

The purpose of this section is to inform members of the public of the gas PAYG replacement project and the approvals given by the CRU based on information provided by GNI and its working group. The CRU expects to consult on the more detailed aspects of the metering system in 2025 when more information is known. The CRU invites feedback on the High-Level Design approved features detailed below.

GNI together with its Gas PAYG Replacement Solution working group (made up of gas suppliers which provide a PAYG service in the Irish energy market), have been carrying out market research and engaging with numerous meter system vendors on the market over the past year. The purpose of this was to design a new gas PAYG meter system that would replace the current meter system which is approaching end of life. It is intended that the solution will be both enduring as well as a cost-effective.

In December 2023, GNI submitted a Recommendation Report to the CRU outlining the reasons why the new gas PAYG meter system should be a Thin/Connected Solution rather than a Thick/Non-Connected Solution. This is explained in more detail in section 1.1.5 below. Based on the information provided, the CRU approved GNI's recommendation.

In April 2024, GNI submitted a High-Level Design Document which outlined the main principles of the new system. The purpose of this was to ensure all parties agreed to the principles that would then be used for the next stage of the project which is the meter tendering process. The CRU supported GNI's High-Level Design recommendations and will continue to work with GNI to ensure the new system is in the best interest of gas customers.

The CRU's key principles submitted to GNI are:

- The new PAYG system should offer customers an online top-up option
- Customers should still be able to top-up in retail outlets

- The new PAYG system should serve all existing PAYG customers<sup>2</sup>
- The new PAYG system should be capable of operating with hydrogen blends
- The new PAYG system should be likely to be supported for some time into the future (no foreseen longevity issues for the meter hardware or software).
- The customer should be able to clearly read their credit status and should not be disconnected due to data frequency delays after topping-up.

The following section outlines the principles that were agreed for the new gas prepayment meters system and describes how it is expected that information will flow between the consumer and their energy supplier.

### **1.1.5 Thin/Connected System**

The gas PAYG system that is currently being used by gas customers today is considered a Thick/Non-Connected system. This means that the customer's balance is calculated on the gas meter and only sends meter data (such as customer balance) to GNI and their energy supplier when the customer interacts with the meter, such as topping-up. Customers can only top-up by purchasing credit at a retail outlet and then insert their credited gas card into their meter.

In recent years, the market for gas meters has shifted from Thick/Non-Connected" systems to Thin/Connected systems. When GNI issued its Request for Information in Q4 2023 when only a small number of vendors noted that they could offer a Thick/Non-connected system. Furthermore, it became apparent that as less vendors are providing Thick/Non-Connected meters, there would be a risk that if the meters could no longer be manufactured, that the Thick/Non-Connected solution would not be an enduring solution.

Moreover, the cost-estimate differentials presented to the CRU for a Thick/Non-Connected and a Thin/Connected system were considered low. Given the additional benefits that a Thin/Connected system could offer to customers, it was seen as more cost-effective. Therefore, the CRU supported GNI's recommendation that the new gas PAYG meter system will be considered as a "Thin/Connected system".

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<sup>2</sup> The CRU has since acknowledged that some customers may not be able to avail of the new PAYG system due to low cellular connectivity in certain areas. Alternative solutions will be sought for these customers.



This Thin/Connected system includes a SIM card embedded into the customer’s meter and allows data that is collected on the meter to be sent to GNI and suppliers’ systems daily, whether or not the customer has interacted with the meter that day.

This means that unlike the current PAYG meter system, whereby the customer’s balance is calculated on the meter itself, it will be calculated in Suppliers’ systems and will be displayed in agreed channels provided by the supplier such as a web portal or mobile application for customers to view their account information.

The new Thin/Connected meter would simply record the volume of gas used and this information will be sent to gas suppliers’ systems to calculate the customer’s credit/debt balance and emergency credit (if applicable)..

The table below shows the differences between a Thin/Connected and Thick/Non-Connected meter system.

	<b>Differences between a Thick/Non-Connected Meter System and a Thin/Connected Meter System</b>	
	<b>Thick Meter/Non-Connected System (What customers have now)</b>	<b>Thin Meter/Connected System- (Potential new system)</b>
<b>Interaction with meter</b>	<ul style="list-style-type: none"> <li>• Customer can view balance on meter display</li> <li>• Customer must interact physically with meter when topping-up (using their gas card)</li> </ul>	<ul style="list-style-type: none"> <li>• Customer only has to interact with meter if self-reconnecting (has entered into a negative balance and/or run out of emergency credit)</li> </ul>
<b>Self-Disconnections</b>	<ul style="list-style-type: none"> <li>• If a customer’s balance goes below zero and emergency credit has not been applied or has been used up, the gas</li> </ul>	<ul style="list-style-type: none"> <li>• If the customer’s balance goes below zero and emergency credit has not been applied or has been used up, there will be a short delay in the gas supply being cut.<sup>3</sup></li> </ul>

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<sup>3</sup> Timelines around disconnection will be consulted on in the consultation paper in 2025.

	supply is cut immediately.	
<b>Self-Reconnection</b>	<ul style="list-style-type: none"> <li>To regain supply, the customer tops-up their gas card at a retail outlet and then inserts it into the meter. Gas supply is restored immediately.</li> </ul>	<ul style="list-style-type: none"> <li>To regain supply, the customer tops-up either at a retail outlet or online and presses a button on the meter. Gas supply is then restored immediately.</li> </ul>
<b>Daily Data</b>	<ul style="list-style-type: none"> <li>Customer does not have access to gas consumption data. Customers only have access to credit balance information.</li> </ul>	<ul style="list-style-type: none"> <li>Customer has access to gas consumption data</li> </ul>
<b>Low Balance Alerts</b>	<ul style="list-style-type: none"> <li>Suppliers cannot send customer low balance alerts to let customers know that they are running low on credit</li> </ul>	<ul style="list-style-type: none"> <li>Supplier can send customer low balance alerts</li> </ul>
<b>Change meter parameters quickly</b>	<ul style="list-style-type: none"> <li>Changes to tariffs, emergency credit, debt recovery etc only appear after customer has interacted physically with the meter when topping up using their gas card</li> </ul>	<ul style="list-style-type: none"> <li>Changes to tariffs, emergency credit, debt recovery etc can be made within 24 hours</li> </ul>
<b>Switch to Credit Mode</b>	<ul style="list-style-type: none"> <li>PAYG meter cannot be switched to credit mode</li> </ul>	<ul style="list-style-type: none"> <li>PAYG meter can be switched to credit mode remotely (if requested by customer)</li> </ul>
<b>Time for Updating Customer Balance</b>	<ul style="list-style-type: none"> <li>Customer's balance is immediately updated on meter when Customer inserts their gas card and tops-up.</li> </ul>	<ul style="list-style-type: none"> <li>When a customer tops-up in a retail outlet or online, the new balance will appear on their mobile application or on their supplier's web portal immediately. If the customer had self-</li> </ul>

	<ul style="list-style-type: none"> <li>As gas is used and the customer's balance reduces, this is registered instantaneously on the meter.</li> </ul>	<p>disconnected and supply was stopped, then the customer tops-up and will need to press a button on the meter to regain access to gas supply quickly.</p> <ul style="list-style-type: none"> <li>However, as gas is used and the balance decreases, there will be a short delay in registering this on their mobile application or on their supplier's web portal. The reason for this is the data from the meter is only sent to the supplier's systems once a day.</li> </ul>
<b>Communications</b>	<ul style="list-style-type: none"> <li>Thick/Non-Connected meters are not reliant on telecommunications network. The customer's balance is calculated and sits in the meter.</li> </ul>	<ul style="list-style-type: none"> <li>For the customer's balance to be updated on the meter, it is reliant on a good cellular telecommunications network</li> </ul>

**Table 1: Differences between a Thick/Non-Connected Meter System and a Thin/Connected Meter System**

### 1.1.6 System Overview

Gas Networks Ireland (GNI) will be responsible for:

- installing and maintaining the new PAYG gas meters
- maintaining a record of meter asset data for all meters installed on the network and;
- providing meter reads to suppliers

Gas Suppliers will be responsible for:

- providing a PAYG billing system to calculate the customer's balance
- providing an online and in-store service to allow customers to top-up their PAYG accounts and;

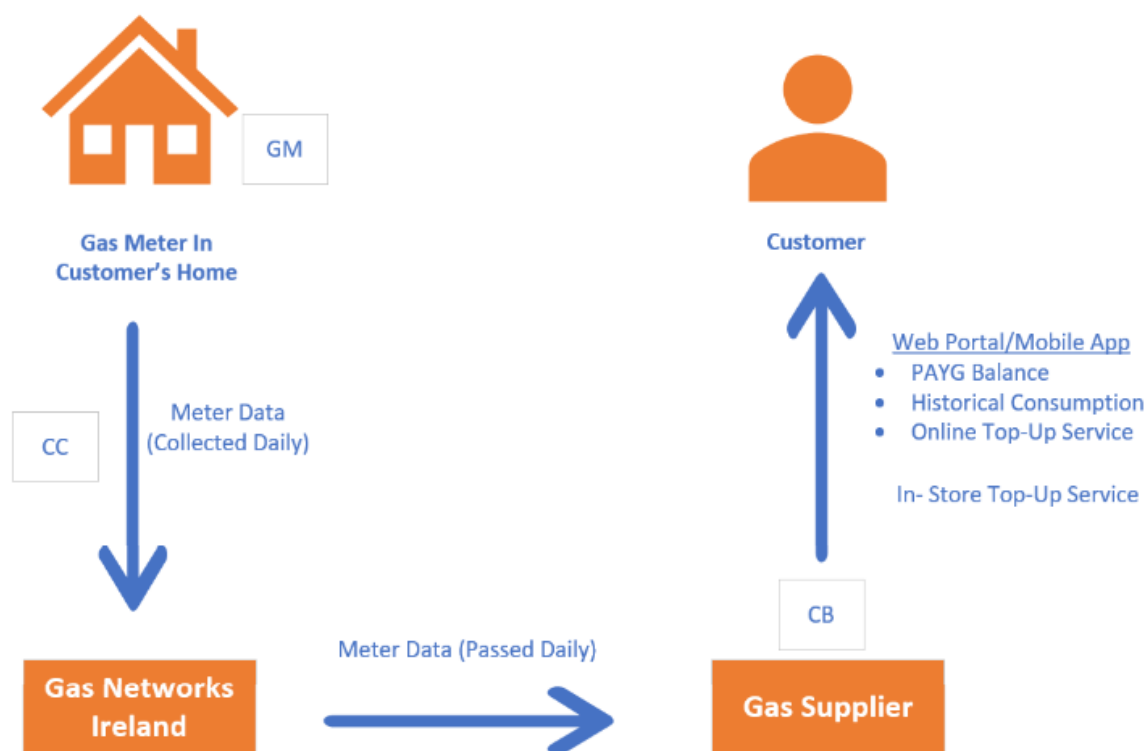
- providing data to customers including but not limited to top up, balance and consumption data

<b>GNI &amp; Gas Supplier’s Responsibilities for new PAYG meter system</b>	
<b>Gas Networks Ireland</b>	<b>Gas Supplier</b>
Supply, fit and maintain new PAYG gas meters	Provide a PAYG billing system and bill the customer for gas consumed
Maintain a record of meter asset data for all meters installed on the network	Provide both online and retail outlet methods to allow customers to top-up
Provide meter reads to the gas supplier to facilitate accurate customer billing	Provide consumption and top-up transaction data to customers

**Table 2: GNI & Gas Supplier’s Responsibilities for new PAYG meter system**

Customers will be able to view their energy consumption data, credit balance and other information through their supplier’s agreed channels.

The table below gives a high-level view of the data flows from the customer’s new gas PAYG meter to GNI’s systems, through to the Supplier’s systems and onto a mobile application or web portal whereby the customer can view their balance and top-up online if they wish to do so.



**Figure 1 - High-Level Design of new gas pay-as-you-go meter system**

**GM** – Gas PAYG Meter provided by Gas Networks Ireland

**CC** – Cellular Communications sent through SIM Card embedded in Meter

**CB** – Calculated Balance for customer

1. The Customer's gas PAYG meter records the volume of gas consumed and any meter events or alarms that may take place.
2. Once a day, this data is sent through cellular signals to GNI's systems.
3. GNI's system collects the data and converts it from volume of gas to kWh and sends this, together with any meter alarm alerts<sup>4</sup>, to the customer's gas supplier.
4. The gas supplier's PAYG billing system calculates the customer's balance and manages any emergency credit and debt recovery.

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<sup>4</sup> Meter alerts include low battery, tamper and low pressure events

5. The gas supplier will provide a web portal (some will also provide a mobile application) whereby the customer can view their balance, top-up online and view their historical gas consumption (granularity of the data to be decided at a later date).
6. When a customer tops-up online or at a retail outlet, a signal is sent to their supplier's systems and the customer's balance is updated on their gas supplier's mobile application or web portal. The customer will not need to interact with, or touch, the meter generally. However, if the customer had a negative balance and as a result had been disconnected, the customer would top-up their balance and would be required to follow instructions on the meter to restore gas supply. This is a safety measure to remind customers to ensure they have turned off any gas appliances before supply is restored<sup>5</sup>.

### **1.1.7 Data Collection from The Meter**

Gas meters are powered by a battery rather than electrical mains due to safety precautions. As a result, and to prolong the battery life of the meter, GNI proposes therefore that the meter will communicate with GNI and Supplier's systems automatically once every day. This communication will send gas consumption data, battery status and any alarm data to GNI (and onward to Supplier's systems). The communication will also allow the meter to receive any valve open/close commands (e.g. to reconnect a customer) and firmware upgrades.

The fact that the new gas PAYG meter will only communicate once every day, will mean that if PAYG customers:

- who are in negative balance at the time of the communication, and have used all the Emergency Credit, would not be immediately disconnected.
- who had already been disconnected from supply could self-reconnect (without waiting for the GNI communication to the meter) by topping-up (and interacting with the meter per instructions which are likely to be pressing a button on the new gas PAYG meter).

When more information is available, the granularity of the data from the meter, will be consulted on at a later date.

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<sup>5</sup> It is expected that this will be a message to the customer to press a button on the meter and confirming that all gas appliances have been switched off

### 1.1.8 The New Gas Meter Features

#### Operation of the Meter

GNI expects the new meter will have an expected 20 year life and the battery within it will have an expected life of approximately 10 years. The new meter is also expected to be compatible with hydrogen blends of at least 20% as a future proof measure. The open/close valve on the meter which opens or closes the supply of gas to the meter will be operated remotely via GNI systems.

#### Customer Experience

Table 3 below shows the customer facing features of the current, and new meter.

<b>Current gas PAYG meter vs new gas Thin/Connected PAYG meter</b>		
<b>Feature</b>	<b>Current PAYG Meter</b>	<b>New Thin/Connected PAYG Meter</b>
Credit Balance	Customers can see credit balance on the meter	Customers can see their credit balance via supplier's web portal/mobile app
Top-up	Customers can top-up by purchasing credit in a Retail Store	Customers can top-up by purchasing credit in a Retail Store and/or by topping up online
Low Balance Alerts	Not currently available	Customers will receive low balance alerts and estimates on how many days the customer's balance is likely to last
Consumption history	Customers cannot view gas consumption history	Customers will be able to view gas consumption history (granularity not yet decided) via supplier's portal
Switch from PAYG to credit	A new gas meter must be fitted if PAYG customer wishes to switch to credit mode	A new meter will not need to be fitted if PAYG customer wishes to switch to credit mode
Disconnection	If customer runs out of credit, the PAYG meter self-disconnects from supply	If customer runs out of credit, PAYG meter will not be automatically disconnected from supply (policy on timelines to follow at later stage)
Reconnection	If a meter disconnects from supply due to negative balance, supply is restored when customer top-ups their card at a retail store and inserting it into the meter	If a meter disconnects from supply due to negative balance, supply is restored when customers either top-up online or in a retail store and follows a procedure on the meter (presses a button)

**Table 3: Current Gas PAYG meter vs new gas Thin/Connected PAYG meter**

### **1.1.9 Other New Alternative Meter Solutions**

The CRU recognises that the new Thin/Connected System PAYG meter may not suit all PAYG customers. This may include for example, customers who may not have access to the internet to view their balance and/or customers who live in an area where cellular network may not be sufficient, and/or customers who may have other concerns.

For this reason, the CRU will continue to engage with GNI and gas suppliers on alternative solutions to suit the needs of those customers who wish to continue with a Gas PAYG service. Any such solution(s) reached will be discussed in a later consultation paper when more information is available.

### **1.1.10 Project Costs**

In December 2023, GNI procured an external consultancy to prepare a costings report for the new gas PAYG Thin/Connected System. As GNI and the PAYG gas suppliers are responsible for different parts of the new gas PAYG Thin/Connected System, they will bear the cost of their respective parts.

The overall cost of the new Thin/Connected gas PAYG meter system is estimated to be €111 million. This includes the procurement of the physical gas PAYG meters, the installation costs, battery replacement costs, IT costs, supplier's PAYG billing system and retail outlet payment service costs as well as mobile application and web channels for customers to top-up and check their balance. The costs also include maintenance costs over a 20-year period.

The costs estimated for gas suppliers may prove to be lower as some suppliers may tailor their existing PAYG systems that they developed for electricity for the gas market which would save costs on developing new systems.



## 3. Conclusion

The CRU has given GNI approval for this High-Level Design of the new gas PAYG meter system. The principles were agreed based on the supporting documentation submitted to the CRU from GNI and its working group of gas suppliers.

As mentioned above, there is much work ahead and many of the detail in terms of the specific features of the new meter system are yet to come. The CRU therefore expects to consult again in 2025 when more information is available. In the meantime however, the CRU welcomes feedback on the content of this consultation and as a guide provides two high level questions below, but welcomes any commentary provided.

### Questions

1. Do you have any comments or concerns you would like to share based on the High-Level Design presented in this paper?
2. If you are an existing gas PAYG customer, are there any features that you would like the new meter system to have that would enhance your experience?

## 4. Next Steps

The CRU is seeking views from suppliers, consumer interest groups, industry groups, members of the public and all other interested parties regarding the questions raised in this consultation paper.

Feedback to this consultation will be considered by the CRU and a decision on the topics included in this consultation is expected in H1 2025.

Gas Networks Ireland together with its working group, will continue their work in designing and procuring a new gas PAYG meter system. They will also continue to research and gather information that will be used to consult on the more detailed design of the meter and possible alternative meter solutions for those who will not be able to avail of the new meter system.

The CRU acknowledges that the working group established by GNI for this project is operating well and that both GNI and the gas suppliers are aware and agree on the responsibilities they have in terms of delivery of the new GPAYG meter system on this project. The CRU therefore would like to thank GNI and the suppliers involved for progressing this project in a meaningful way.

It is expected that the CRU will publish another consultation paper in H2 2025. It expects that this consultation will include data collection & distribution, alternative meter solutions for those who will not be able to avail of the new system and, timelines for balance updates and disconnections.

In time and where necessary, the CRU will incorporate any decisions made through the consultation papers into the next revision of the Electricity and Gas Suppliers' Handbook.