Real Time Settlement Methodology (RTSM) Programme – Session 2

Stakeholder Engagement Forum

23rd September 2025

SGN bip. correla

Welcome and Introductions

SGN

Meet the Team

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Expectations for the Sessions

1. RTSM awareness
2. Interactive deep-dives
3. Your insights matter
4. Learn and refine together

Q&A

2509705

Agenda – Session 2

Time	Topic	Lead
14:00 – 14:05	Welcome and Opening Remarks	SGN
14:05 – 14:10	Actions from Previous Meeting	SGN
14:10 – 14:20	Recap of Session 1	BIP
14:20 – 15:00	Work Package 2 (Part 1)	Correla
15:00 – 15:10	Check Point and Break	All
15:10 - 15:40	Work Package 2 (Part 2)	Correla
15:40 – 16:00	Q&A	All

Actions from Previous Meeting

ACTION:

- Publish meeting materials from the previous meeting.

UPDATE:

- The slides were published on the SGN RTSM website.
- Meeting notes & actions issued on 4 September 2025.

SGN

Work Package 1 Recap - Market Research

WP1

Key Requirements for the Desired Solution

Input integration

The proposed solution should be integrated with existing systems which will provide input data required to perform the simulation

SCADA & Telemetry
- Pressure
- Volumetric flow
- Gas CV

GIS
- Network topology
- Asset location
- Pipe diameter

Gas demand
- Measured volume for daily metered
- Hourly gas demand estimation for NDM* costumers

CV simulation software

The new software should be able to estimate the calorific value of the gas mixture for each delivery point of the network

Software features
- *Modelling option*: CFD, Machine Learning, Hybrid
- *Gas flow*: Steady state vs Unsteady representation
- *Gas flow*: Uniform vs Non-Uniform representation
- *Pipe representation*: 1D vs 3D modelling

Settlement & Billing Integration

The output of the model (CVs) should be integrated with the current billing and settlement systems to account for the energy balance

Settlement
CVs must be provided daily at distribution zone level

Billing
The CVs for each delivery point should be provided for the period of the readings

Key requirements

Topology data	The model requires reliable GIS data to replicate the network topology
SCADA & Telemetry data	The model should integrate data from SCADA and Telemetry with the time resolution available
Transparency	As the purpose of the model is settlement and billing, transparency of the result is a key aspect
Accuracy test	The adoption of CV modelling implies the use of a simulated CV instead of a measured CV; accuracy level is therefore a critical factor
Adaptability	The model should be able to adapt to network changes (new injection point, new infrastructures, demand variation, maintenance, gas escapes etc.)
Billing & Settlement integration	Ultimately, the model should be integrated into a billing and settlement process

*Non-daily-metered

WP1

Key take away from WP1

Modelling options
A hybrid model that combines CFDs for simulation, and Machine Learning for demand estimation and data cleaning represents the optimal solution. This approach effectively balances **transparency, accuracy, and reliability.**

Time resolution
Daily resolution is sufficient for **settlement** purposes, while **hourly resolution** is more appropriate for **billing**.

Node granularity
Calculations at the delivery point level are possible but may **lead to challenges** in managing and exchanging large volumes of data.
Node-level calculations are a **viable alternative**, as **accuracy is not expected to be significantly impacted**.

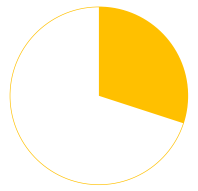
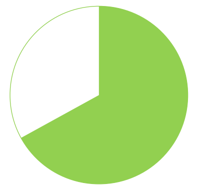
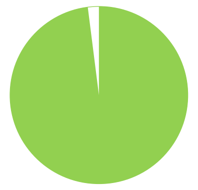
Regulation update
The increased injection of green gasses and adoption of a modelled CV solution may require changes to key legislation such as GS(M)R, GCoTER and UNC.
Further in-depth analysis will be presented in WP2 – Modelling Solution and WP3 – Feasibility Study

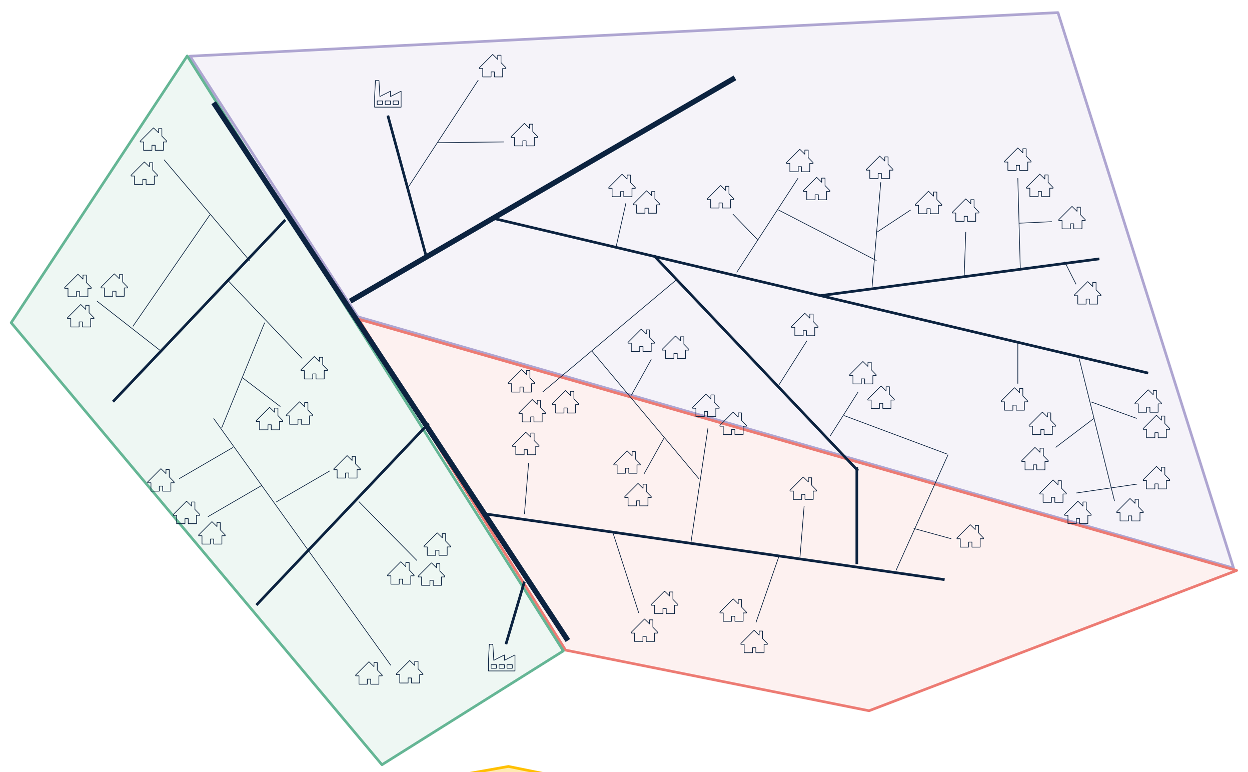
Market overview
Network operators adopt **various strategies for integrating renewable gases** (100% H_2, biomethane, 20% H_2 blend, e-CH_4, smart meters). From a modelling perspective, **most software solutions are either CFD-based or hybrid;** only **a few comparable pilot projects** have been observed in Europe.

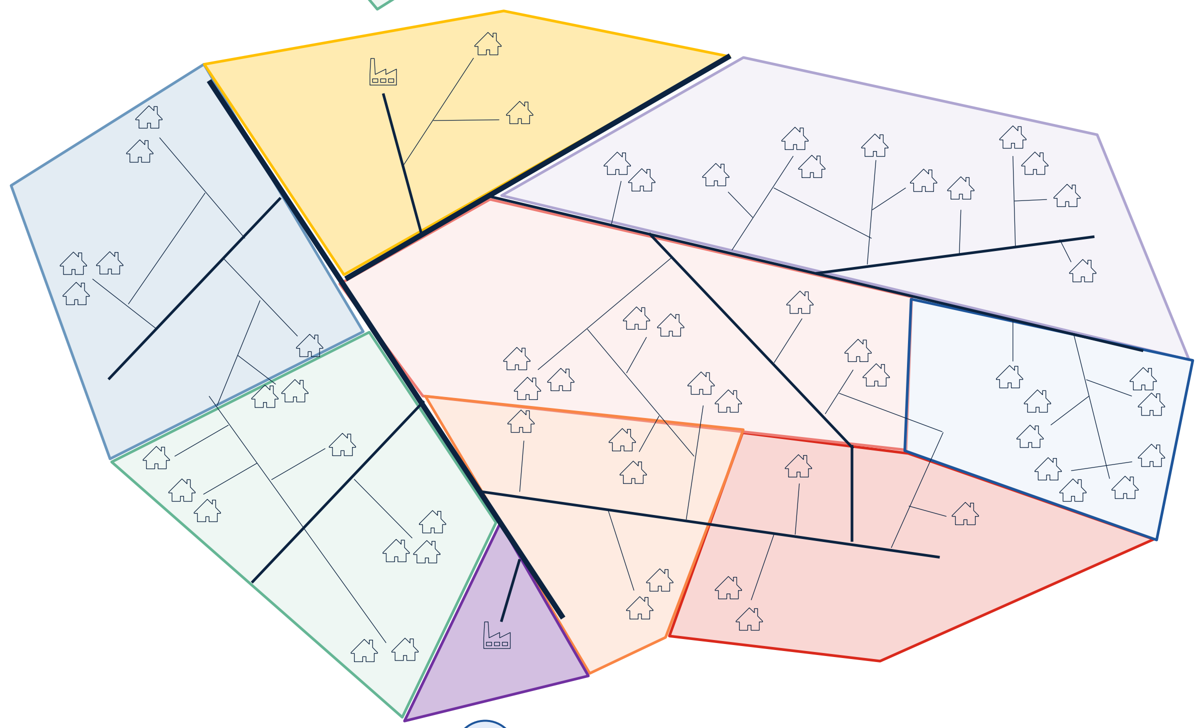
The slides were published the week following the first session: Stakeholder Session 1 Material.

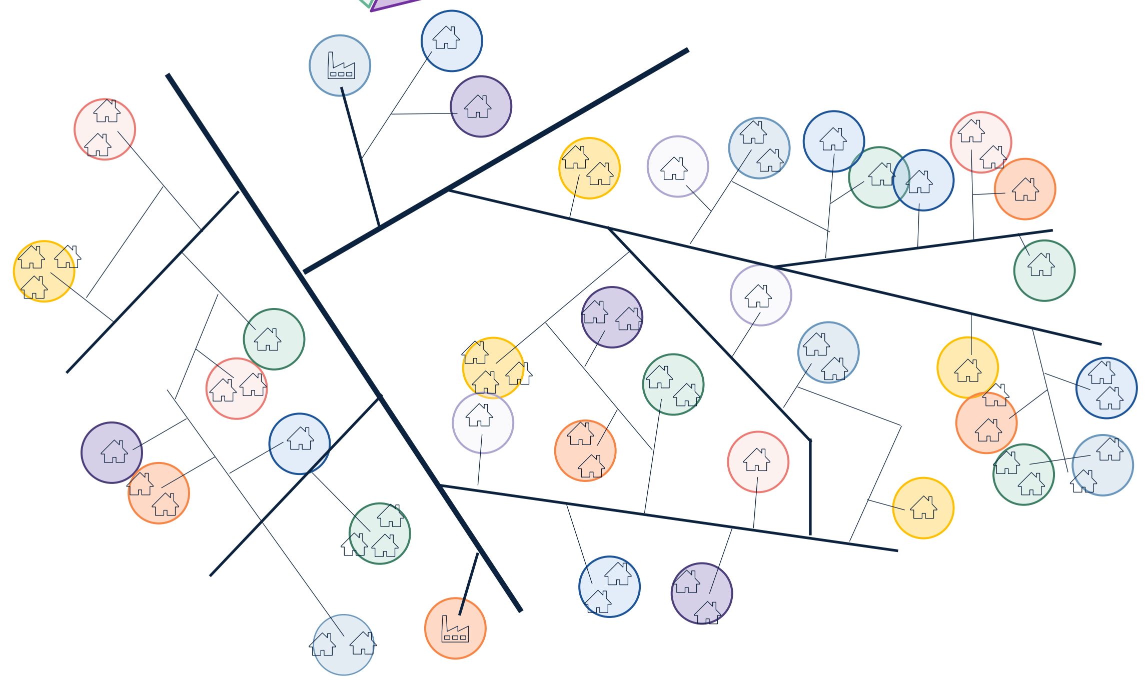
WP1

Node Granularity

	#CVs calculation	Computational requirement	Accuracy
1 The CV is computed at **macro area level.** This approach implies the identification of **homogeneous area within the local network** for which the same value is assigned; this approach may reduce the accuracy of the calculation.	*x10s*	**Low**	
2 The CV is computed at **strategic nodes.** It requires the identification of the strategic nodes and the assignment of the **same CV to all the meters directly linked to it.**	*x1,000s*	**Medium**	
3 The CV is computed at **each delivery point.** This approach computes a **different CV for each customers**. It provides high level of detail and accuracy but requires huge computational power.	*x10,000,000s*	**High**	







Areas may be defined based on **network topology or political boundaries**

High numerosity of CVs implies the need **to manage huge amount of data** by the parties involved

Mixed approach
It is also possible to mix different granularity to **reduce complexity**: **areas particularly interested by renewable gases injection can be modelled with high detail** while areas not affected can be modelled as homogeneous zones.

Low *Medium* *High*

bip.

WP1

Time resolution

Time resolution

Time resolution[1]	*Accuracy*	*Computational capacity*
Less than an hour Not advised due to the high computational cost and **limited added value compared to hourly** resolution.		
Hourly resolution Optimal compromise for **capturing intraday fluctuations,** without overwhelming computational resources. However, **hourly demand profiles are not available.**		
Daily resolution **Currently used for settlement processes.** It offers a practical approach with reasonable accuracy and low computational cost.		

When is the simulation performed ?

Monthly	**Monthly intervals are suitable for billing but not for settlement.** The billing process occurs monthly; moreover, data from NDM points are not available daily.
Daily	**Daily runs are required to perform the settlement process. On day D[2]**, the process **simulates the activities of D-1**. Preliminary simulation for billing must be adjusted monthly based on measured data.
Real time – *hourly*	Real time simulation implies **high complexity and is not strictly necessary** for billing and settlement (it may be more useful for network monitoring instead). Moreover, **not all data are often available hourly.**

Low *Medium* *High*

1) Gas demand at each delivery point should be provided with the same time resolution adopted to run the model. Where demand is not known standard profiles could be used
2) Day D = Today

Work Package 2 - Modelling Solutions

correla

Work Pack 2 Aim

- Development of a fit-for-purpose modelling solution(s) that addresses the requirement for application according to the input of the Central Data Service Provider (CDSP) while enabling flexibility for confluence migration between them.

- An overview of the Basis of Design that describes:
  - Current market structures and required amendments in the market structures and connection frameworks.
  - Basic architecture of proposed new systems considering key essential requirements such as the interlink between solutions for a fluid and uncomplicated process for transition.
  - Potential changes in the UNC and key gas industry regulations.

The following slides provide a summary of the activities & outputs from Work Pack 2.

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Foundation of the Required Modelling Solution(s)

- The following slides cover three main topics:
    1. Current systems and processes and interactions with other industry parties.
    2. Modelling solutions & design themes.
    3. Impacts on CDSP systems, regulations & stakeholders.

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1. Current Systems and Processes and interactions with other industry parties

Topics Covered under this Area

- Gas industry market structure
- Flow Weighted Average Calorific Value (FWACV)
- Daily Gas Allocations
- Unidentified Gas (UIG)
- Gas Flow Day activities
- Meter Reading & Reconciliation
- Annual Quantity (AQ)

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Gas Industry Market Structure

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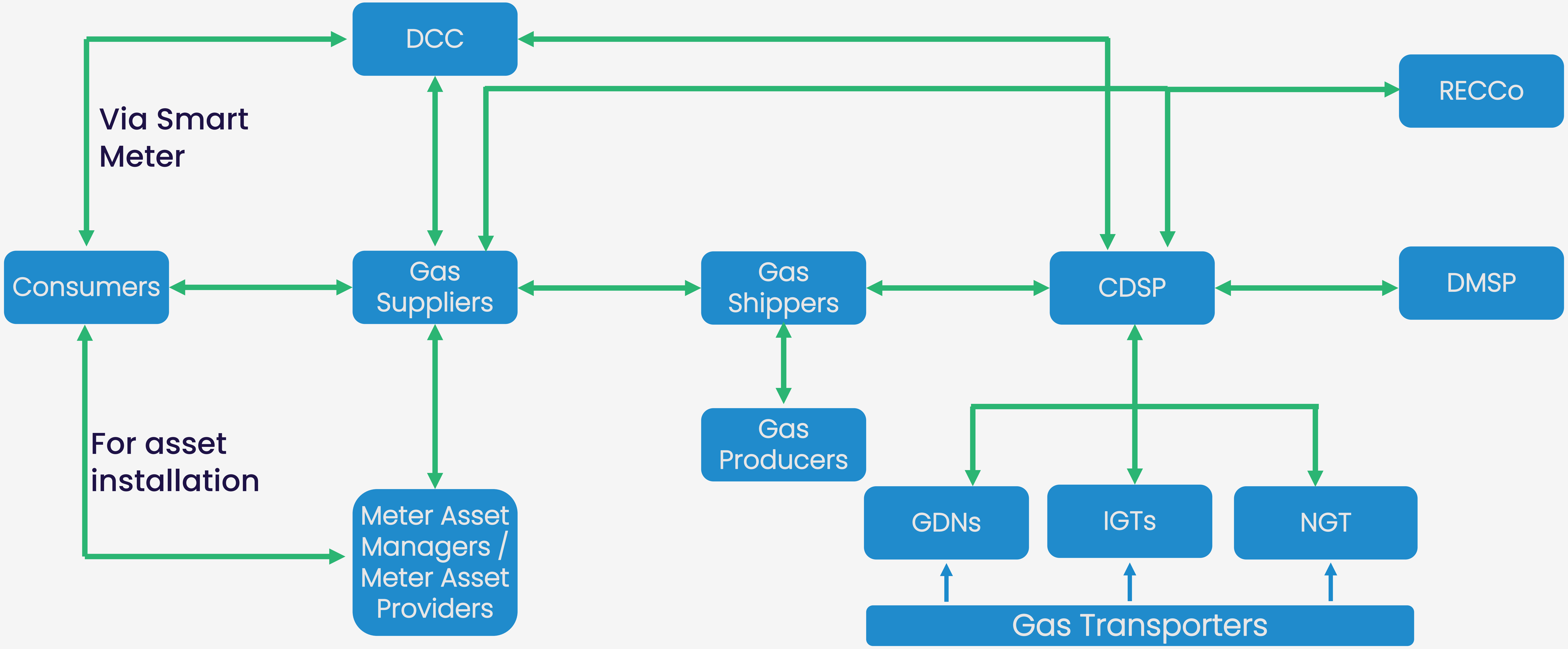
Gas Industry Market Structure



It is not anticipated that there will be any changes to the current market structure as a result of RTSM implementation.

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Flow Weighted Average Calorific Value (FWACV)

How the Central Service Provider (CDSP) uses FWACV

- Flow Weighted Average CV (FWACV) values for distribution zones (LDZs) are calculated by the CDSP, used in CDSP settlement processes and sent to Gas Shippers for calculation of end consumer billing.

- FWACV is a method used to calculate the average calorific value of gas supplied to a charging area. This calculation is weighted by the proportion of the total daily gas flow represented by each individual gas source.

- The CDSP uses the daily LDZ FWACV of gas to ensure accurate billing and energy content measurement for gas transported through the gas network. The CV is used for:
    - Energy Calculation: The FWACV is used to calculate the energy content of the gas for billing to Shippers.
    - Data Reporting: The CDSP collects and reports CV data to various stakeholders, including gas shippers. This data is essential for consumer billing, transparency and regulatory compliance.

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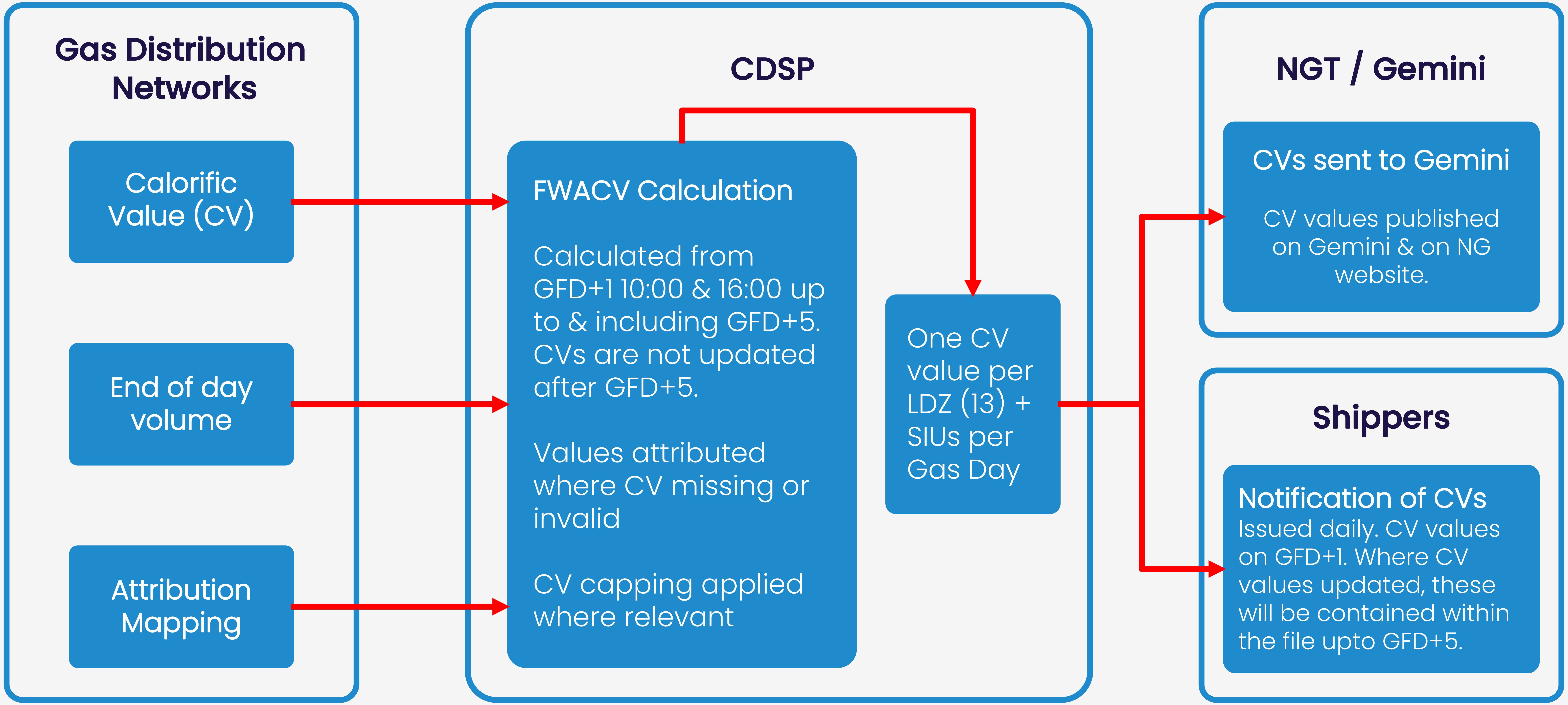
Current Daily CV Process



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Flow Weighted Average CV (FWACV) Calculation

Measurement Point	Volume (mcm)	CV (MJ/m^3)	Energy (MJ)	
A	5	39.6	198	5 * 39.6
B	4	40.1	160.4	4 * 40.1
C	2	38.6	77.2	2 * 38.6
D	1	38.2	38.2	1 * 38.2
Total	12		473.8	

= 473.8 / 12

FWACV	39.5
Capped CV (lowest source CV + 1Mj/m3)	39.2
Lower of above two values	39.2

GCoTER cap the value of the daily charging CV, there can be no more than 1MJ/m3 variance above the lowest source CV

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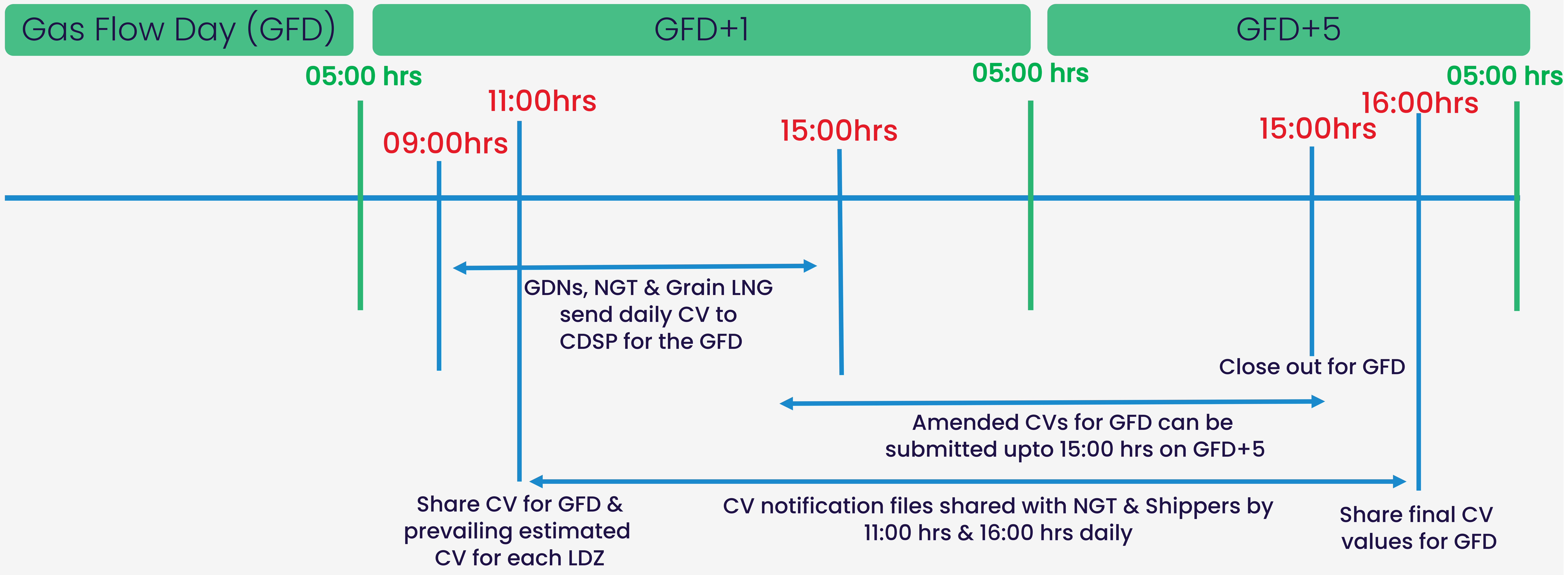
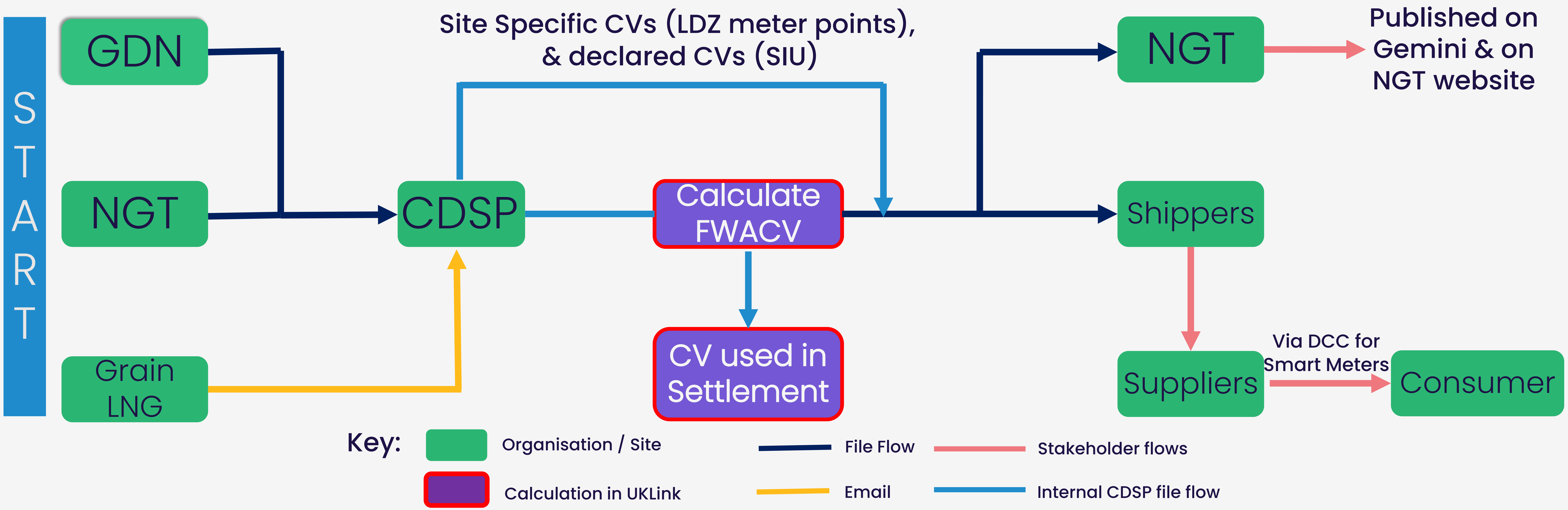
Gas Flow Day Activities Relating to CV



Data Flow between Stakeholders relating to CV



Note:
- Site Specific CVs (NTS & LDZ meter points) and SIU (Statutory Independent Undertaking) CVs are not part of FWACV calculation. SIUs have a declared CV. The values received from GDNs will be sent to Shippers/NGT in notification files.
- The volume data for Boil Off site will be sent directly from the site operator - Grain LNG to CDSP
- CV, Volume and Energy is submitted to CDSP (CV only for SIUs)
- Reference to NGT is data sent to & from Gemini system

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How Gas Shippers & Suppliers use CV

- We believe that Gas Shippers use Calorific Value (CV) in the following ways:
  - Billing and Settlement: Shippers use CV to ensure accurate billing and settlement with gas suppliers and consumers.

- We believe that Gas Suppliers use Calorific Value (CV) in the following ways:
  - Billing: CV is used to convert the volume of gas consumed into energy units (KWh). This ensures that customers are billed based on the actual energy content of the gas they use.
  - Regulatory Compliance: Suppliers must adhere to regulations that require the use of CV for calculating thermal energy. This ensures consistency and fairness in billing practices.

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Daily Gas Allocation

Daily Gas Allocation

- All energy consumed in each Local Distribution Zone (LDZ) must be shared out each day – after accounting for “Shrinkage” (losses, leakage and the GDN’s Own Use Gas) and stock of gas left in the system
- For the c. 1,500 DM sites, daily gas allocation is based on actual measurements or estimated usage – these sites make up c. 12% of the LDZ market
- For the remaining 25 million sites, daily gas allocation is based on an estimation formula which uses the Annual Quantity (AQ) and profiles that are specific to each End User Category (EUC)
- The balancing figure in each LDZ each day is Unidentified Gas – “UIG”

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Daily Metered (DM) vs. Non-Daily Metered (NDM)

Daily Metered – are allocated gas based on actual readings from an on-site recorder – or CDSP estimates a read if no actuals received

- Reads must be provided daily by the Daily Metered Service Provider (Class 1) or Shipper (Class 2)
- Reconciliation processes apply after a period of estimates – and [annually] when the on-site equipment is re-synchronised to the actual meter reading
- FWACV is used to calculate daily energy from meter readings and to calculate AQ & reconciliation energy

Non-Daily Metered – are allocated gas based on their Annual Quantity and the NDM Algorithm

- Actual Readings aren't used in daily allocation, so FWACV isn't used either
- The Shipper submits actual readings in batches for Class 3 and periodically (monthly or annually) for Class 4
- Reconciliation compares the actual consumption to the original daily allocation
- FWACV is used to calculate actual energy from meter readings and to calculate AQ & reconciliation energy

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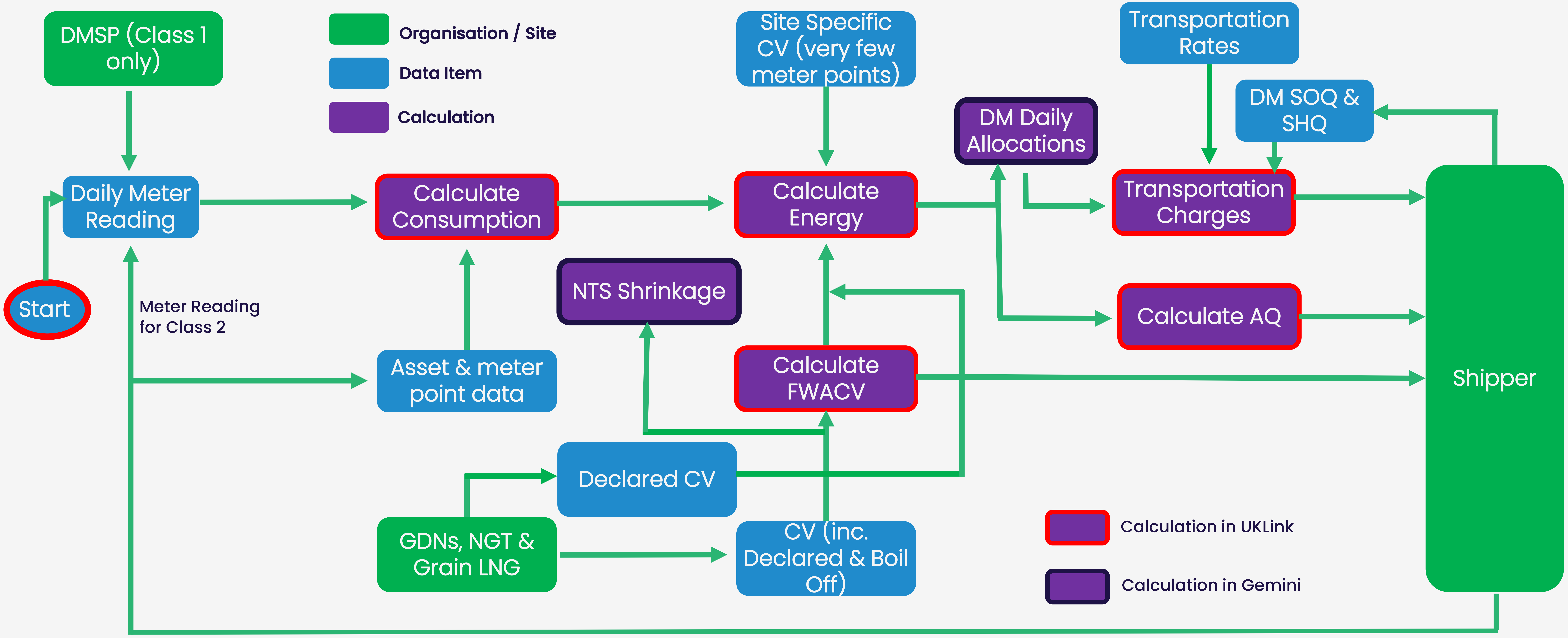
CDSP Process & Flows Relating to Allocation – LDZ DM Meter Points



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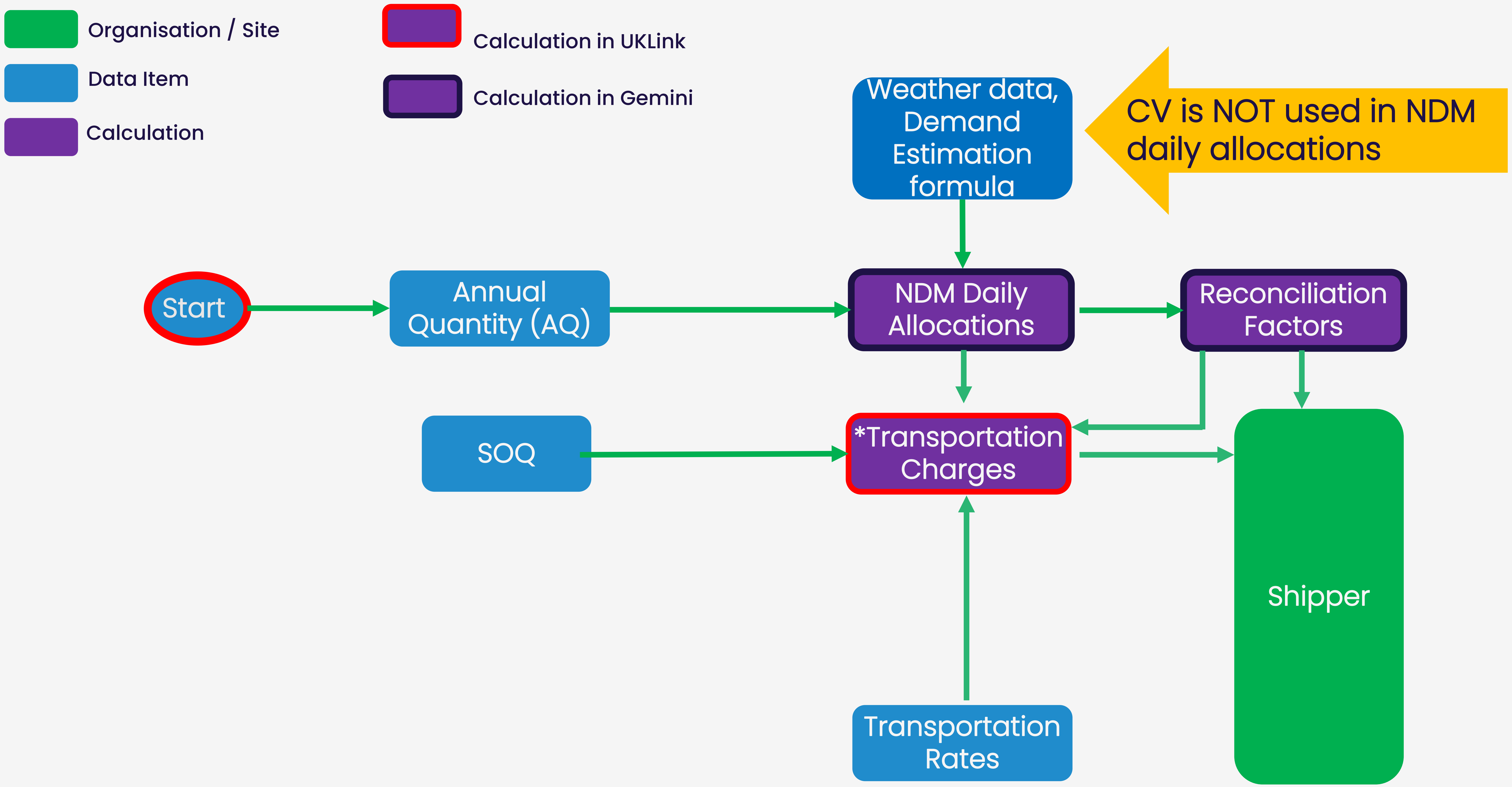
CDSP Process & Flows Relating to Allocation – LDZ NDM Meter Points



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Unidentified Gas (UIG)

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What is Unidentified Gas

- Most gas consumed in Great Britain can be accounted for as it is metered and registered. However, some gas is lost from the system, or not registered, due to theft, consumption by unregistered supply points and other reasons.

- The gas that is off-taken from the LDZ system but not attributed to an individual Supply Meter Point or accounted for as Shrinkage, is referred to as **UIG.**

- CDSP calculates an initial daily position as part of daily gas allocation – this position gets updated for the next 3-4 years* as part of the monthly reconciliation process – will reduce to just a 2-year period in 2026 due to two UNC Modifications

** Will always be a 2-year period as of April 2026, due to 2 approved UNC Modifications (0886 and 0896)*

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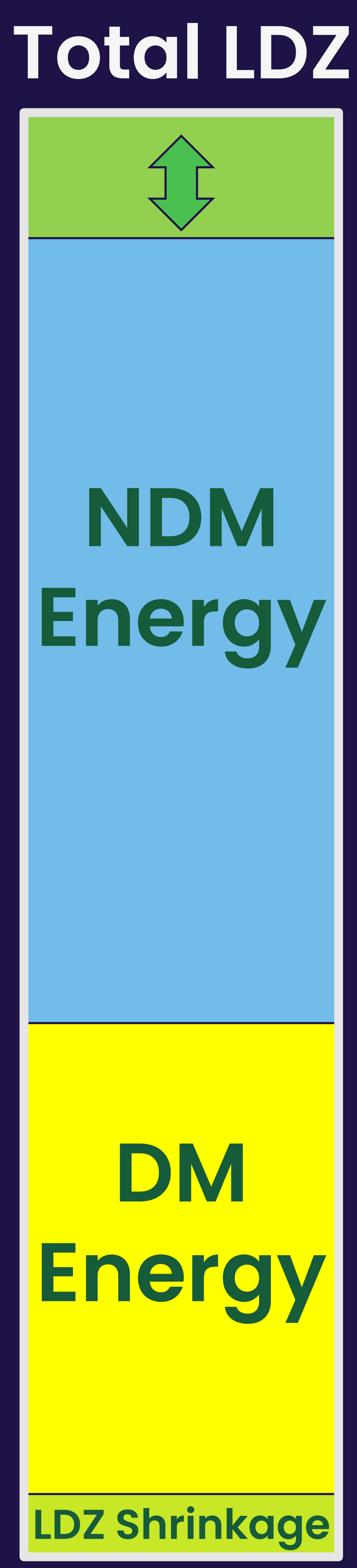
Unidentified Gas



UIG = Balancing figure in the LDZ each day

Calculation of UIG

- UIG is calculated each day for each LDZ separately

UIG = Total LDZ Energy – DM Energy – NDM Energy – Shrinkage

- UIG is shared between Shippers who have a portfolio in the LDZ using weighting factors that assign different proportions of UIG to different classes of meter points.
- FWACV is used in the calculation of total LDZ energy and DM Energy
- Inaccuracies in any of the four components would result in an inaccuracy in UIG

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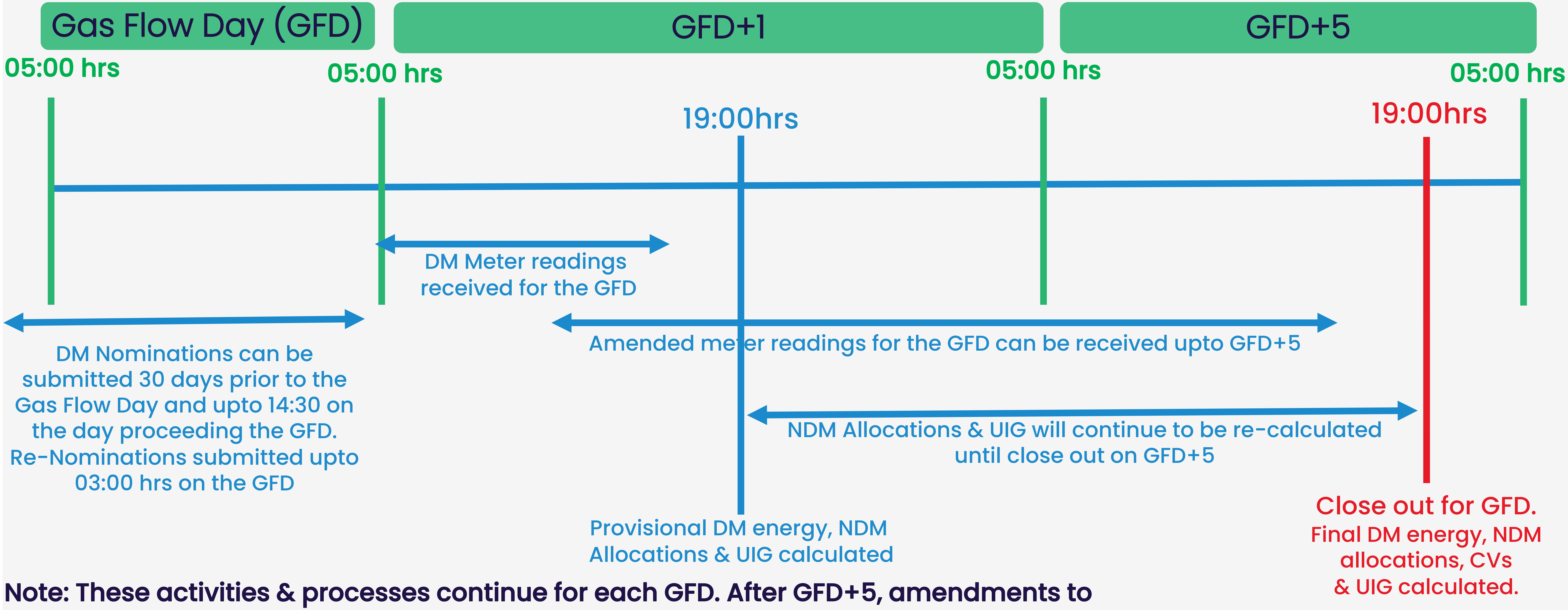
Gas Flow Day Activities

Gas Flow Day Activities Relating to Nominations & Allocations



Note: These activities & processes continue for each GFD. After GFD+5, amendments to DM & NDM allocations are via Reconciliation, amendments to UIG via UIG Reconciliation. No amendments made to CV after GFD+5.

Energy Balancing / Daily Balancing

Gas Nominations

Each day, for each Shipper, total gas input & offtaken from the LDZ are calculated & used for Energy Balancing charges. For DM meter points, where gas input does not equal gas offtaken, Scheduling Charges are applied to the Shipper.

Gas Allocations

Gas Input into the LDZ

Gas input & off-taken within each LDZ should balance

Gas Offtaken at premises in the LDZ

Shipper

If too much gas or not enough gas in the LDZ, NGT, as balancing operator, must inject more gas or remove gas (into Storage) from the LDZ

National Gas

CV is used in the calculation of total LDZ input energy and DM Offtake Energy

- Process
- Data
- Stakeholder
- Calculation in Gemini

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Meter Reading and Reconciliation

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Purpose of Reconciliation

To update/correct the energy position after close-out of allocation for:

- Actual DM reads if estimates were used in allocation
- Actual NDM usage as revealed by actual meter readings compared to the original estimates from the NDM algorithm
- Resynchronisation of automated reading equipment to the actual meter index (DM and NDM)
- FWACV is used in all those calculations to determine the actual or updated energy
- Also correction of any errors in the gas measured into the LDZ – this uses the actual CV at the offtake, not FWACV

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Daily Metered (DM) vs. Non-Daily Metered (NDM) Reconciliation

- Daily Metered reconciliation processes use daily FWACV to convert the daily metered volume into KWh for reconciliation
- If the CV used in the calculation is higher than the actual CV experienced at the site, the actual energy used in reconciliation will be **too high, reconciliation charges would be too high**
- Unidentified Gas would be **reduced** by the same amount

- Non-Daily Metered reconciliation processes need to convert the original daily allocation in KWh to volume to compare the metered volume
- We divide the daily allocated energy by the daily CV to get a daily volume factor
- If the CV used in the calculation is higher than the actual CV experienced at the site, the actual energy used in reconciliation will be **too low, reconciliation charges would be too low**
- Unidentified Gas would be **increased** by the same amount

An RTSM solution could mitigate inaccuracies due to CV discrepancies for both DM and NDM

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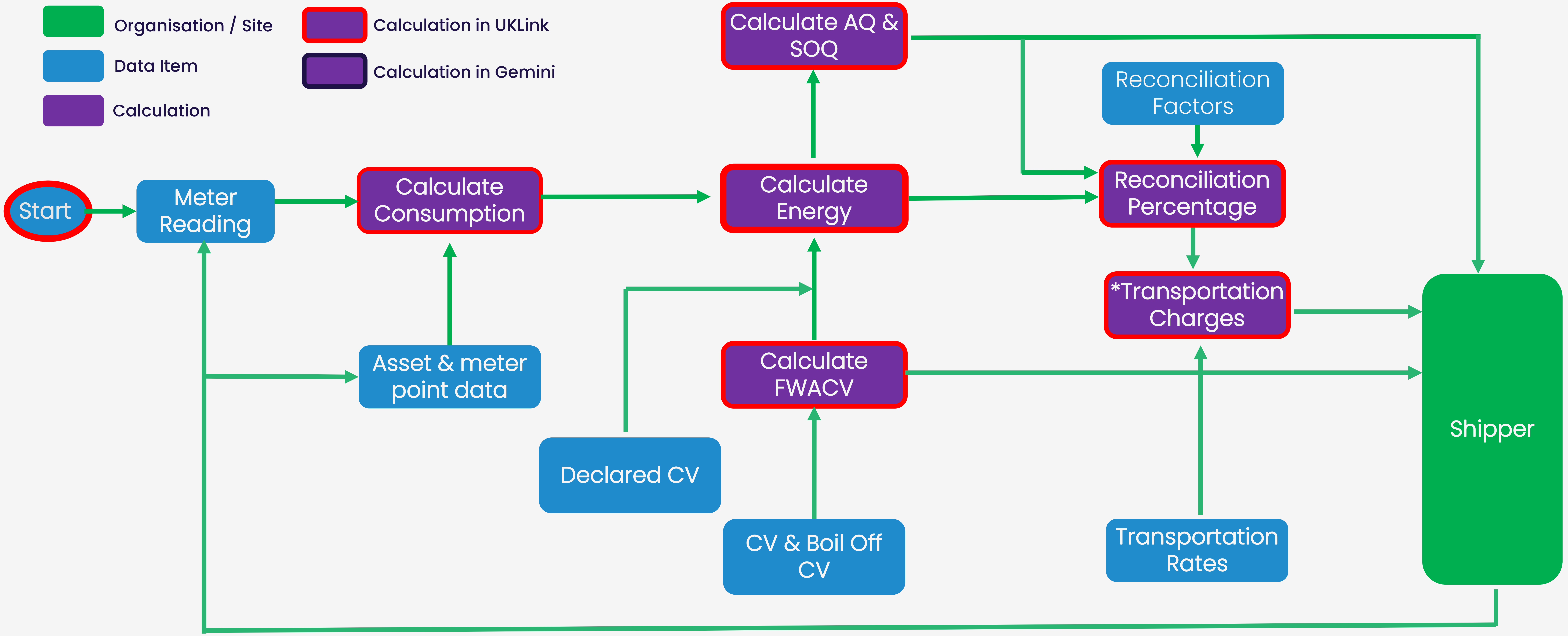
CDSP Process & Flows Relating to Reconciliation – LDZ NDM Meter Points



Where a valid meter reading is received, for NDM meter points, this results in Reconciliation Energy and Transportation Charges

Annual Quantity (AQ)

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Annual Quantity (AQ) Calculation

- For Daily Metered meter points, the AQ is the total consumption in KWh between two meter readings 365 days apart
- The KWh figure uses the prevailing daily FWACVs
- If the CV used in the daily energy calculation is higher than the actual CV experienced at the site, AQ will be **too high**

An RTSM solution could mitigate inaccuracies due to CV discrepancies for both DM and NDM

- Non-Daily Metered AQ is based on the gas (kWh) consumption between two meter readings between 9 and 36 months apart – ideally 365 days apart. The consumption is then weather-correction to give a value in Seasonal Normal terms
- The KWh figure uses the prevailing daily FWACVs
- If the CV used in the daily energy calculation is higher than the actual CV experienced at the site, AQ will be **too high**

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Importance of AQ

- For NDM meter points, an inaccurate AQ can have significant implications.
  - Incorrect daily allocation of gas – with a knock-on effect to UIG.
  - Possible inappropriate End User Category and less accurate gas allocation patterns across the year.
  - Bigger swings in Meter point reconciliation and UIG reconciliation on the amendment invoice when meter readings are accepted
  - Incorrect SOQ and incorrect rates of transportation costs.
  - Meter readings may be rejected because they fail the meter reading tolerances.
- For DM Meter Points, the AQ is used to determine if the meter point meets the Class 1 AQ threshold (AQ above 58,600,000 kWh).

Too high a CV in the energy calculation will result in the AQ being overstated and vice versa if too low

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Check Point and Break

10 minutes

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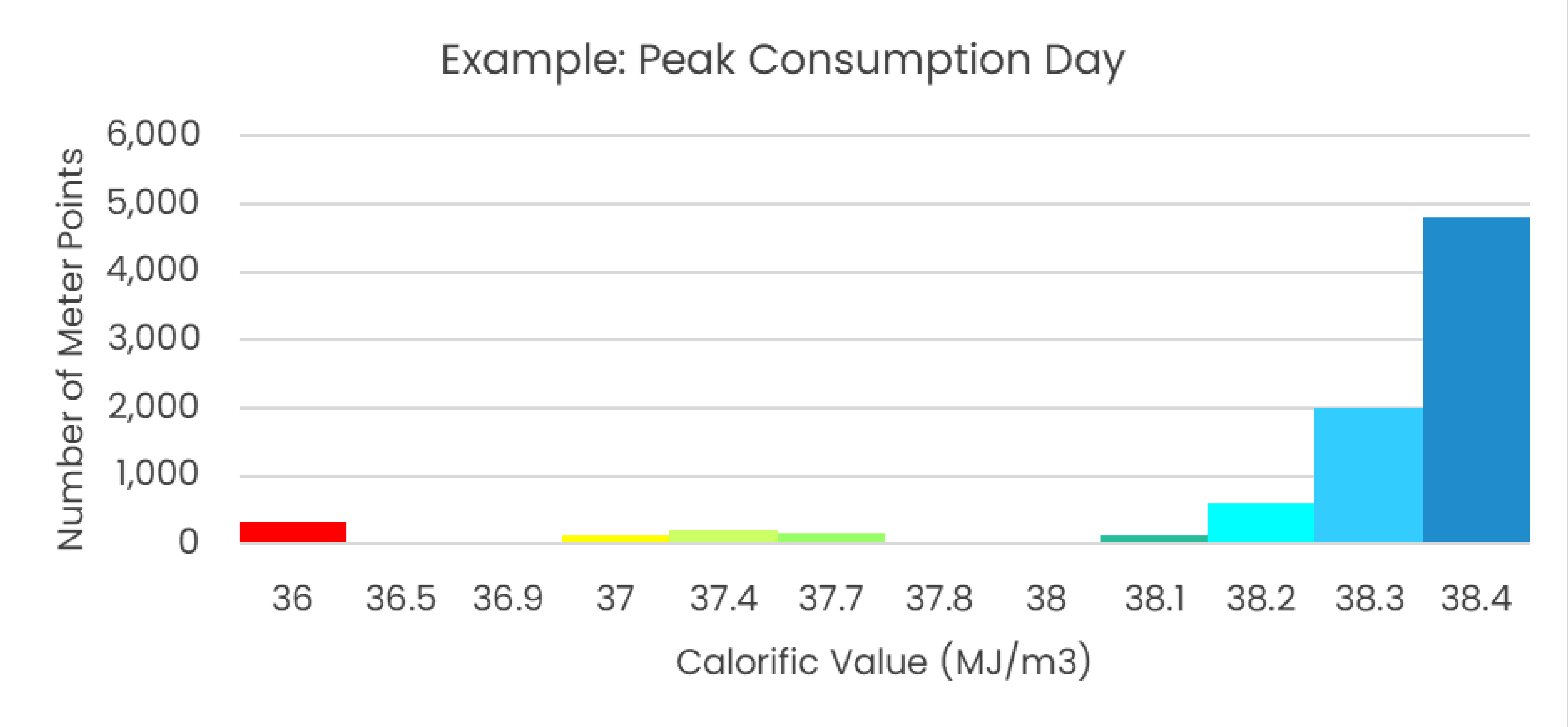
2. Modelling Solution(s) & Design Themes

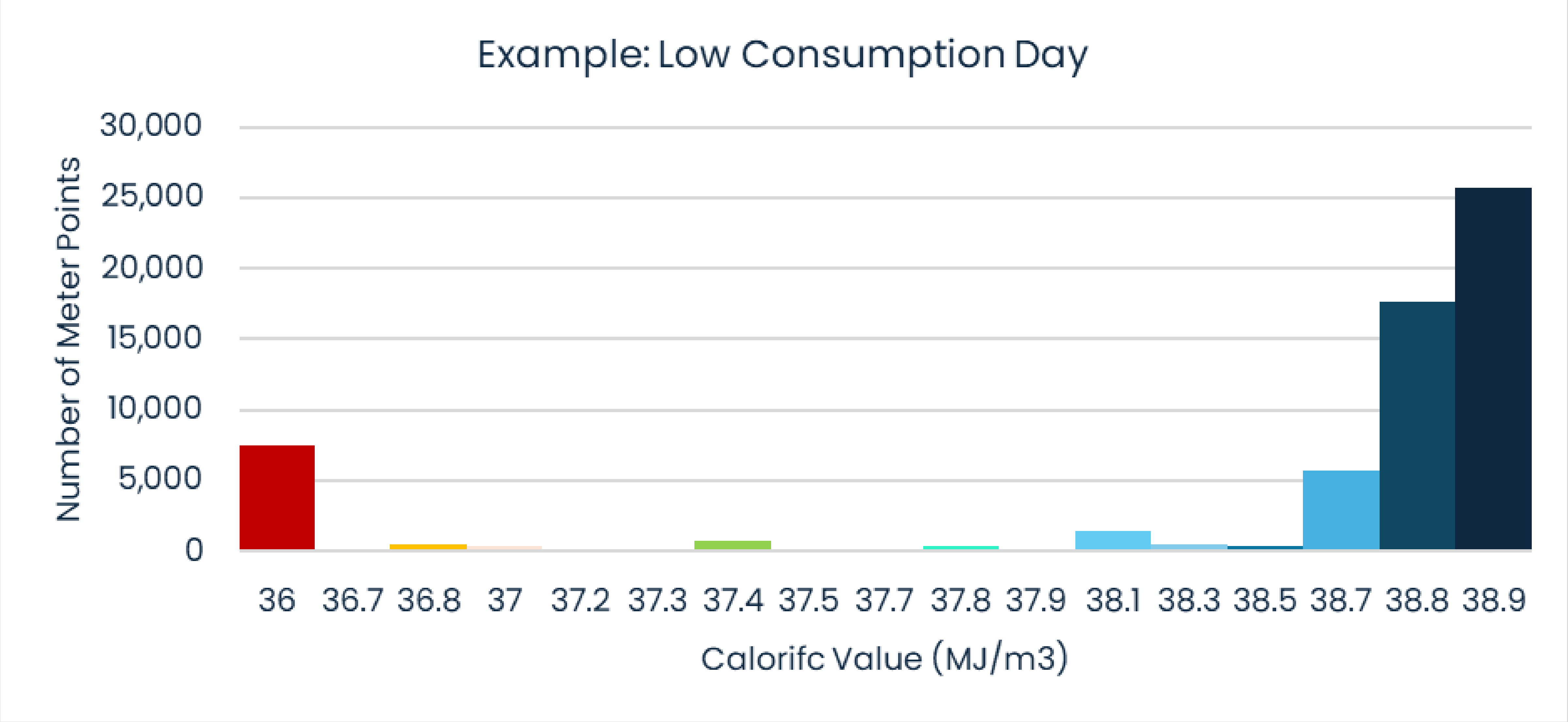
Modelling Analysis

Simplified Calorific Value modelling was carried out for gas meter points in the flow range of an existing biomethane plant. This was to help identify:

- The likely number of meters in the range of the biomethane flow
- The estimated Calorific Values for each day for each group of meters
- A profile of seasonal changes in range and Calorific Values

Analysis showed that the **range of CVs was similar for a low consumption day and a peak consumption day.** The number of meters receiving Biomethane and the number of different CVs were much higher for a low consumption day.





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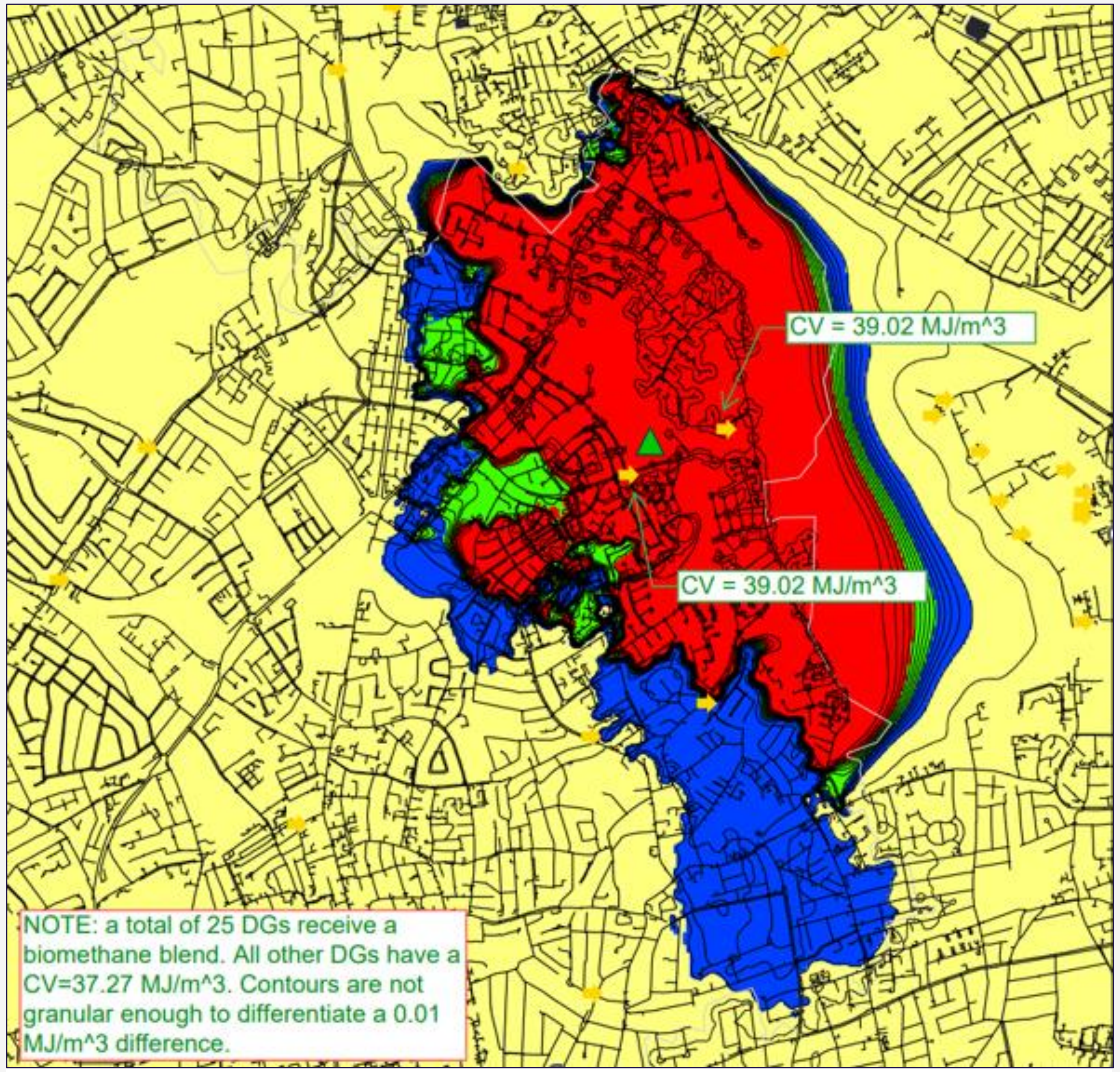
Modelling Analysis - Nodes

- ‘Nodes’ could be used for assigning a calculated Calorific Value to a particular group of meter points.
- These will largely be determined by the nature of the Gas Distribution network and the location of Meter Points.
- The map on the right shows a snapshot of Calorific Values near a Biomethane plant.
- During the day these contours will change shape as different consumption profiles use more or less of the biomethane (e.g. residential or business areas).
- To ensure energy measurement is accurate and fair, the nodes used in the RTSM system should reflect the actual Calorific Value of the gas consumed during the whole gas day.



The mean average calorific value (CV) of biomethane injected into the IPMP system by the Mitcham Biomthane plant for the month of January 2025 is 39.02 MJ/m^3.

A biomethane and natural gas blend of the noted CV enters the LP system at the indicated District Governors (DGs).

The yellow areas on the map indicate pure natural gas with no biomethane blending, with a CV of 37.26

Legend

Contours

Result Higher Heating Value (MJ/m^3)

- <= 37.26
- 37.70
- 38.14
- 38.58
- >= 39.02

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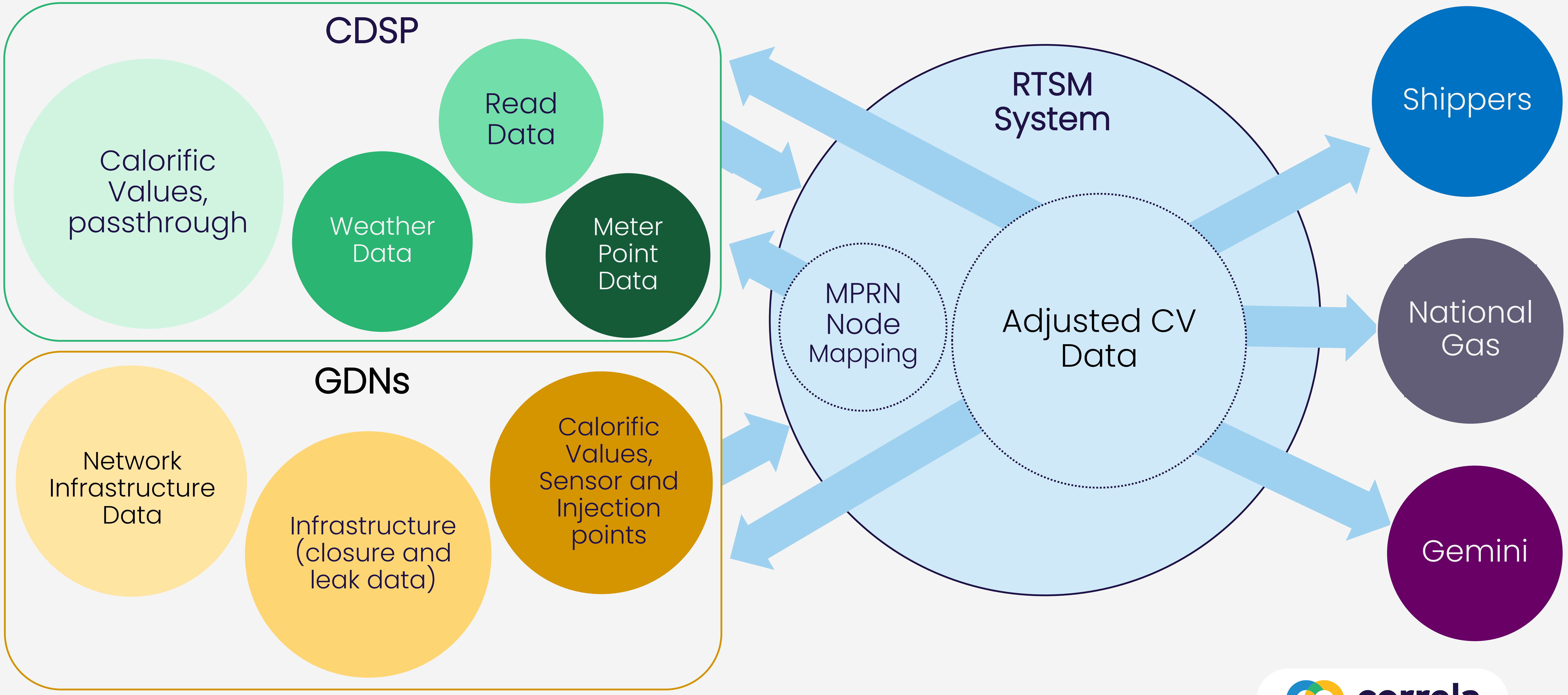
Likely Data Flows



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RTSM Solution Architecture Considerations

- Phased or 'Big Bang' Approach – Meters in range of Biomethane/H_2 plants/all meters
- Granularity of the CV measurement – balancing accuracy with costs/data limitation

- Large and atypical Gas Consumers (Non-Daily Metered sites with non-standard consumption)
- Pipework closures, Interruptions and Leakages

- Compliance – GDPR, Natural Gas Quality Designation ISO, Natural Gas Energy Determination ISO Etc.
- Implementation - User Interface, Training, system usability
- Updating Smart Meter and Prepayment Meter CV information

- Testing and validation, Solution Accuracy – Use of CV monitoring Equipment
- SCADA (Supervisory Control And Data Acquisition) -control and data collection from sensors and devices available within the GDNs' distribution networks

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Materiality Assessment

If we don't implement any changes to the FWACV regime, what do you think is the estimated financial impact on a customer located near a 20% hydrogen injection point?

a) £0 – No impact expected
b) Up to £50/year
c) Over £116/year

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Materiality Assessments

Example materiality assessment for consideration within a future cost/benefit evaluation

Current – Biomethane with Propane

1. A customer with a typical Domestic annual quantity (AQ) situated very close to a Biomethane injection site
2. If the CV of the physical gas that they receive now under current rules is on average 0.75 MJ below the LDZ CV throughout the year, they would typically be over-billed by 1.9% or £14 pa based on their actual meter readings
3. Note: as permitted by Thermal Energy Regs and other consumers may also be over-billed

Future – Unpropanated Biomethane

1. The same typical customer receiving Biomethane without propane with a CV of 36 MJ throughout the year in the future, without CV capping
2. If the LDZ CV of 39.4 MJ was applied, the customer would be overbilled by around 9.5% or £67 pa based on their actual meter readings – **unless the lower CV of their gas is recognised in their billing**

Future – 20% Hydrogen

1. The same customer consistently receiving the full blend of natural gas plus 20% Hydrogen through the year in the future, without CV capping
2. If they physically receive gas with an actual CV of 33.9 based on a 20% by-volume blend, the customer would be overbilled by around 16% or £116 pa based on their actual meter readings – **unless the lower CV of their gas is recognised in their billing**

Assumptions

1. Average AQ of a Domestic site of 11,435 kWh
2. October 2024 price cap of 6.24p/kWh
3. An average Domestic consumer paid c £714 pa for the gas they consumed (excluding standing charges)
4. Based on an average LDZ CV of 39.4 MJ

Addressing these potential billing impacts is a key outcome of the RTSM Programme

Design Themes

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High Level Objectives of a Future RTSM Solution

Primary

- Facilitate the increased injection of green gasses

Secondary

- Enable the settlement and billing of low-carbon gases across a multi-energy grid
- Support fair and equitable billing of gas consumers in a multi-gas grid

Tertiary

- Identify and categorise differing gas qualities across the existing Networks
- Support the existing Settlement timelines (e.g. Gas Flow Day +5)
- Integrate into existing central systems and data flows

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Key Design Themes from Correla Modelling Analysis

INPUTS

Solution will need within-day (Half Hourly?) reads for large sites close to the injection

Complexity of the model over time as more biomethane & hydrogen injections are established.

Lack of daily/hourly reads from large consumers would impact accuracy of CV calculation

Half hourly read data can be provided after the end of the Gas Day – use for training only

Solution would require details of any pipework closures with start/end dates/times

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Key Design Themes from Correla Modelling Analysis

OUTPUTS

Solution may **need to scale** to all gas meter points eventually – will total numbers decline?

Solution may use existing **concept of nodes** – or a new grouping term

Consistency of process and design required across all DNs

Initial **settlement** close-out will **still take place at GFD+5**

View of specific CVs needed shortly after end of Gas Day i.e. within 12-24 hours

Need to communicate updated CV values upto GFD+5

Currently CV is only required at a daily level – within-day CV may be a future phase?

Supplier retains the obligation for any interactions with the smart meter.

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3. Impacts on CDSP systems, Regulations & stakeholders

CDSP System Impacts

Systems & Processes relating to Settlement & CV

Shipper

Submit to UKLink:
- Register meter point
- Submit meter point data
- Submit asset data
- Submit meter readings
- DM SOQ & SHQ values

Receive from UKLink:
- CV & FWACV values, daily
- Transportation invoices
- Class 1 daily DM energy
- Updated AQ values, monthly

UKLink

- Maintain register of all gas meter points
- Hold asset data against relevant meter point
- Hold meter point data against each meter point
- Store meter readings against meter point
- Process meter readings
- **Calculate & store CVs & FWACV & submit to Shippers**
- Calculate consumption & energy
- Calculate AQ
- Calculate SOQ for NDM meter points
- Store SOQ & SHQ against DM meter points
- Calculate & issue transportation invoices

Data Transfer between Systems

- Daily, submit any changes in AQ & SOQ in aggregate at Shipper & LDZ level
- Daily, submit LDZ DM energy

- Monthly, submit Reconciliation Factors
- Monthly, submit calculation of Energy Balancing charges
- Monthly, submit UIG values by

Gemini

- Process Nominations
- Receive energy for Telemetered meter points
- Receive energy for LDZ DM meter points
- Calculate NDM Allocations
- Calculate UIG
- Calculate share of UIG to Shippers
- Calculate daily balancing
- Calculate Energy Balancing charges
- Publish CV & FWACVs

Shipper

Submit to Gemini:
- Submit Gas Nominations

Published on Gemini:
- Shipper daily NDM allocations
- Shipper daily DM allocations
- Shipper daily UIG values
- CVs & FWACVs

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Systems Managed by CDSP Using CV/FWACV - Heat Map

Impact assessment of a modelled CV solution based on the likely level of changes required to systems, data flows plus potential larger volume of data within files & processing required for RTSM.

Low | **Medium** | **High**

CMS - Contact Management Service

Raise queries & submit meter point updates

UKLink Portal

Ability for stakeholders to submit data to UKLink

Gemini

Calculate Consumption & energy – Telemetered meter points
Calculate Balancing charges
Calculate daily allocations (NDM)
Calculate Unidentified Gas (UIG)
Validation of energy using the volume and the CV
Publish & submit (via UKLink) CVs & FWACVs

Gas Enquiry Service

Publish meter point, LDZ & read data

Reporting Systems

Display data (DDP)
Reporting
Energy
AQs/SOQs/SHQs

UK Link

Record CVs
Calculate & record FWACV
Provide CV values to Gemini & Shippers
Calculate Consumption and Energy - LDZ meter points
Calculate & issue Transportation charges
Calculate & issue Reconciliation charges

Data Flows

Notification of CVs to stakeholders
Receipt of CV data from DNs
Transportation invoices

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Stakeholder Impacts

Key Stakeholder Potential Impacts

DNs, Shippers & Suppliers
Cost of system & process changes.
Mapping Nodes to meter points

Shippers
Potential volume of data to process and flow additional CV data to Suppliers.

Consumers
Potentially a daily CV would need to be used for billing where 'blending' is used.
Frequency of dataflows to Smart/PAYG meters.

DNs
Collection of more data to feed CV calculation.
Mapping 'Nodes' to meter points.

Suppliers
Potential volume of additional data to process & change to their customer billing systems.

Suppliers
Increase in the volume of CV data.
Potential increase in consumer queries.

CDSP
System changes.
Volume of data to process.
Replacing mapping meter points from LDZ to 'Nodes'.

Government Bodies
Amendments to Regulations.

NG
Potential impacts to calculation of NTS Shrinkage.

DCC
Possible increase in dataflows to the IHD if meter CV is updated more frequently.

Producers
Delays of impacting amendments to capping rules will incur costs to continue to enrich Biomethane.

Stakeholder engagement will continue throughout Phase 1

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Are there any other implications or considerations that the Programme should capture?

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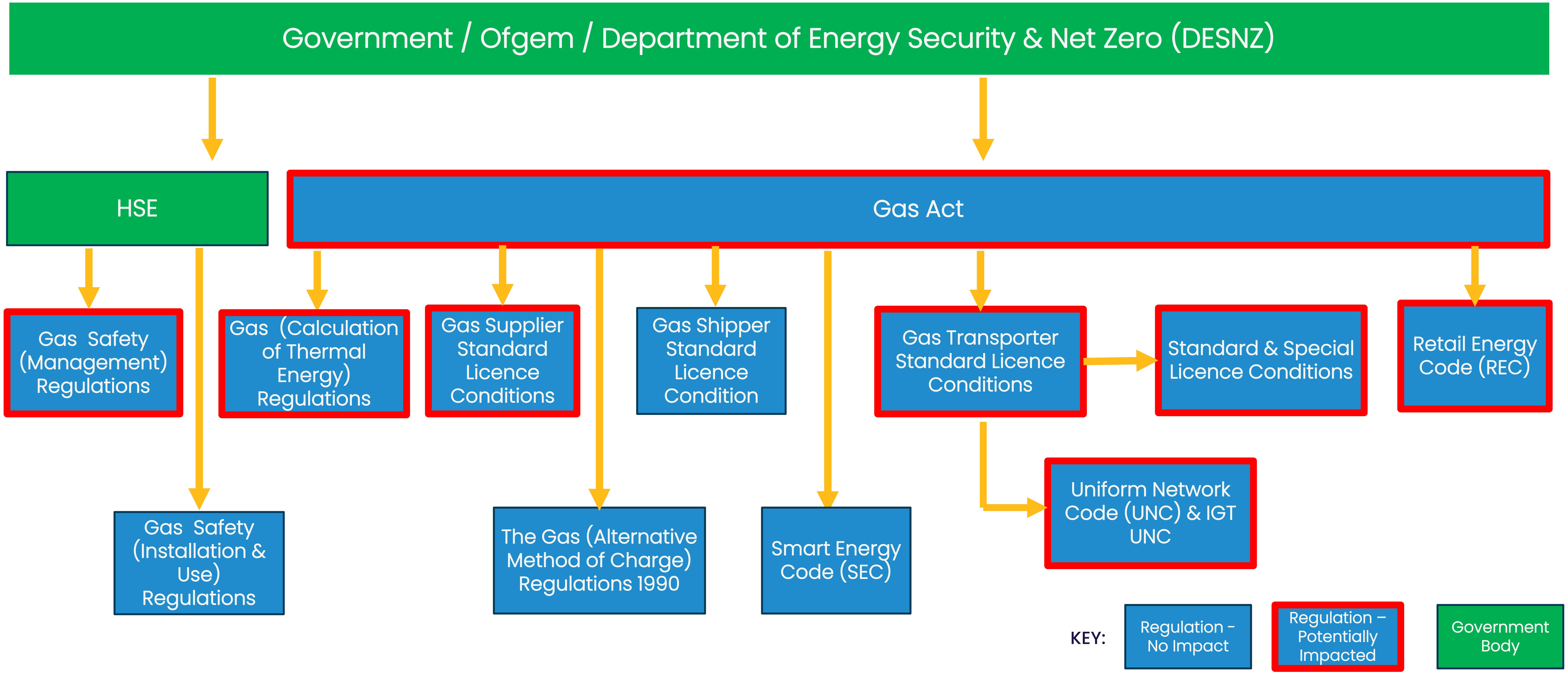
Regulations and Codes

Licence & Contractual Obligation Assessment



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Regulations that may require consideration/amendments

Document	Section
Gas Act	Schedule 3
Gas Safety (Management) Regulations	Regulation 2: Interpretation: Schedule 3: Content & other characteristics of gas
The Gas (Calculation of Thermal Energy) Regulations	Part 1 General: Interpretation and Application Part 2: Calculation of Thermal Energy on Basis of Determined Calorific Values Part 3: Calculation of Thermal Energy on Basis of Declared Calorific Values
Gas Transporter Standard Conditions	Condition 9: Network Code and Uniform Network Code
Standard Special Conditions. Part A	Standard Special Condition A7 Standard Special Condition A11: Network Code and Uniform Network Code
Gas Supplier Standard Licence Conditions	Section B: Standard Conditions for domestic Suppliers
Retail Energy Code	Section 8: Calorific Value Code
Uniform Network Code (UNC)	General Terms Section C (GTC) Offtake Arrangements Document (OAD) Transportation Principal Document (TPD)

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Are there any additional regulations or codes that you believe require review or modification to better support the objectives of this programme?

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Summary of Findings

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Summary of Findings from Work Package 2

An LDZ CV (FWACV) would not work where un-propanated biomethane or blended hydrogen are injected therefore **a lower granularity of CV would be required**.

There is an option to continue with FWACV in part of an LDZ where lower-CV gases do not reach but **as more green gases are injected**, FWACV would need to be **replaced with the Modelling Solution.**

Modelling analysis showed **that more meter points would be affected by green gases on a low demand** day compared to a high demand day

Meter points that could potentially receive the green gas would need to be **mapped to a 'Node'**.

CDSP systems would need to change, particularly UKLink, and updates may be required to Shipper & Supplier systems.

File format changes will be required to accommodate mapping MPRNs to 'zones'.

Some **regulations would need to be amended** & changes may be required to UNC.

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Q&A

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Next Session

28th October   14:00 – 16:00

WP3: Feasibility Analysis

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Additional Materials

Appendices

- RTSM - Useful links
- Glossary
- Gas Industry Players
- How Meter Points are mapped to LDZs & EUCs
- UNC assessment
- Links to further training material

RTSM - Useful Links

- **RTSM (SGN webpage):** https://www.sgn.co.uk/about-us/future-of-gas/rtsm-programme
- **RTSM (XoServe webpage)** - https://www.xoserve.com/decarbonisation/decarbonising-gas/decarbonisation-knowledge-centre/real-time-settlement-methodology-rtsm/
- **Future Billing Methodology**: https://www.xoserve.com/decarbonisation/decarbonising-gas/future-billing-methodology-project/
- https://www.xoserve.com/media/15dp3jfe/rtsm-network-scenarios.pdf
- https://smarter.energynetworks.org/projects/nia2_sgn0046/

For further information please contact:

rtsm@correla.com

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Glossary – Key Terms Used in this Section

AQ	Annual Quantity (estimated annual usage in KWh)
CDSP	Central Daily Services Provider (Xoserve)
DCC	Data Communications Company
DM	Daily Metered (covers Classes 1 and 2)
DMSP	Daily Metered Service Provider
EUC	End User Category
FWACV	Flow Weighted Average CV
GDN	Gas Distribution Network
GFD	Gas Flow Day (05:00hrs on a Day until 04:59hrs the following day)
IGT	Independent Gas Transporter
LDZ	Local Distribution Zone
NDM	Non Daily Metered (covers Classes 3 and 4)
NGT	National Gas Transmission
RECCo	Retail Energy Code Company
SHQ	Supply Point hourly offtake quantity
SOQ	Supply Point daily offtake quantity
UIG	Unidentified Gas

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Gas Industry Players

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Gas Industry Players

- **Central Data Services Provider (CDSP)** CDSP maintains the central register of all gas Supply Meter Points and all data related to the Supply Meter Point e.g. asset, meter readings, address & consumption history. The CDSP provides a suite of services for gas Suppliers, Shippers and Transporters by providing a single point of service for customers and ensure their data is transported securely. CDSP is funded, governed and owned by the gas industry.

- **Consumer** who is supplied with gas conveyed to particular premises

- **Daily Metered Service Provider (DMSP)** Procures daily meter readings for Daily Metered (DM) Class 1 Supply Meter Points. The meter readings are submitted to the CDSP daily.

- **Data Communications Company (DCC):** The DCC manages the telecommunications technology infrastructure for the smart meter roll-out. The smart metering system will support secure data communication across smart metering devices in consumers premises. The DCC collects meter readings from Smart meters & submits to the Supplier.

- **Delivery Facility Operators** are companies who operate the gas processing facilities at terminals around the coast of Britain.

- **Meter Asset Managers (MAMs)** is an organisation that works on behalf of another to install, replace, repair and maintain a Supply Meter Installation;

- **Meter Asset Provider** makes a Supply Meter Installation available for use by a Supplier and consumer

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Gas Industry Players (cont.)

- **Gas Shipper:** a company with a Shipper Licence who buys gas from producers, sells it to the Suppliers and contracts with the GTs to transport the gas to consumers.
    - There are currently 194 Shippers with a Shipper Licence.

- **Gas Supplier:** a company with a Supplier Licence contracts with Shippers to buy gas which they then sell to consumers. A Supplier may also be licensed as a Shipper.
    - There are currently 123 Suppliers with a Supplier Licence.

- **Gas Transporters** operate parts of the network which transport the gas from the terminals to the 24 million gas consumers in England, Wales and Scotland.
    - The NTS is operated by National Gas Transmission.
    - Each LDZ is operated by its relevant gas transporter: Distribution Networks.

- **Independent Gas Transporters (IGTs)** develop, operate and maintain local gas transportation networks. IGT networks are directly connected to the Gas Distribution Network (GDN) via a Connected System Entry Point or indirectly to the GDN via another IGT.

- **Gas Producers** are companies or entities involved in the extraction and production of natural gas from underground reservoirs. Gas producers also inject biomethane into the gas network by increasing the methane content to meet the quality standards required for injection into the gas grid.

- **Retail Energy Code Company (RECCo)** manager & deliver the Central Switching Service.

How Meter Points are Mapped to LDZs & EUCs

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How Meter Points Mapped to an LDZ

- Gas meter points are mapped to a **LDZ** based on their geographical location and the gas distribution network they are connected to.
- Meter Points are mapped to an LDZ at meter point creation on UKLink. This is when the meter point is assigned a unique reference number (Meter Point Reference Number (MPRN)).
- The Post Code of the meter point determines the LDZ.
- Each meter point is linked to the geographical area it serves, ensuring that the gas supply point is correctly mapped to the appropriate LDZ'
- The physical connections of the gas distribution network play a crucial role. MPRNs are assigned to the LDZ that corresponds to the network infrastructure they are connected to.
    - ➢ **Geographical Mapping**: Each LDZ represents a specific geographical area managed by a gas transporter. Gas meter points within this area are mapped to the corresponding LDZ
    - ➢ **Network Connections**: The mapping is also determined by the physical connections to the gas distribution network. Meters connected to the same network infrastructure are grouped within the same LDZ

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How Meter Points are assigned an EUC

- At meter point creation the annual estimated gas consumption is recorded against the meter point: AQ.
- End User Categories (EUCs) are assigned to meter points based on the consumption patterns and characteristics of the gas usage at each meter point.
- Based on the consumption data: AQ, meter points are categorised into different EUCs. These categories reflect the typical usage patterns, such as domestic or industrial & commercial
- This categorisation helps in managing and forecasting gas demand more effectively.

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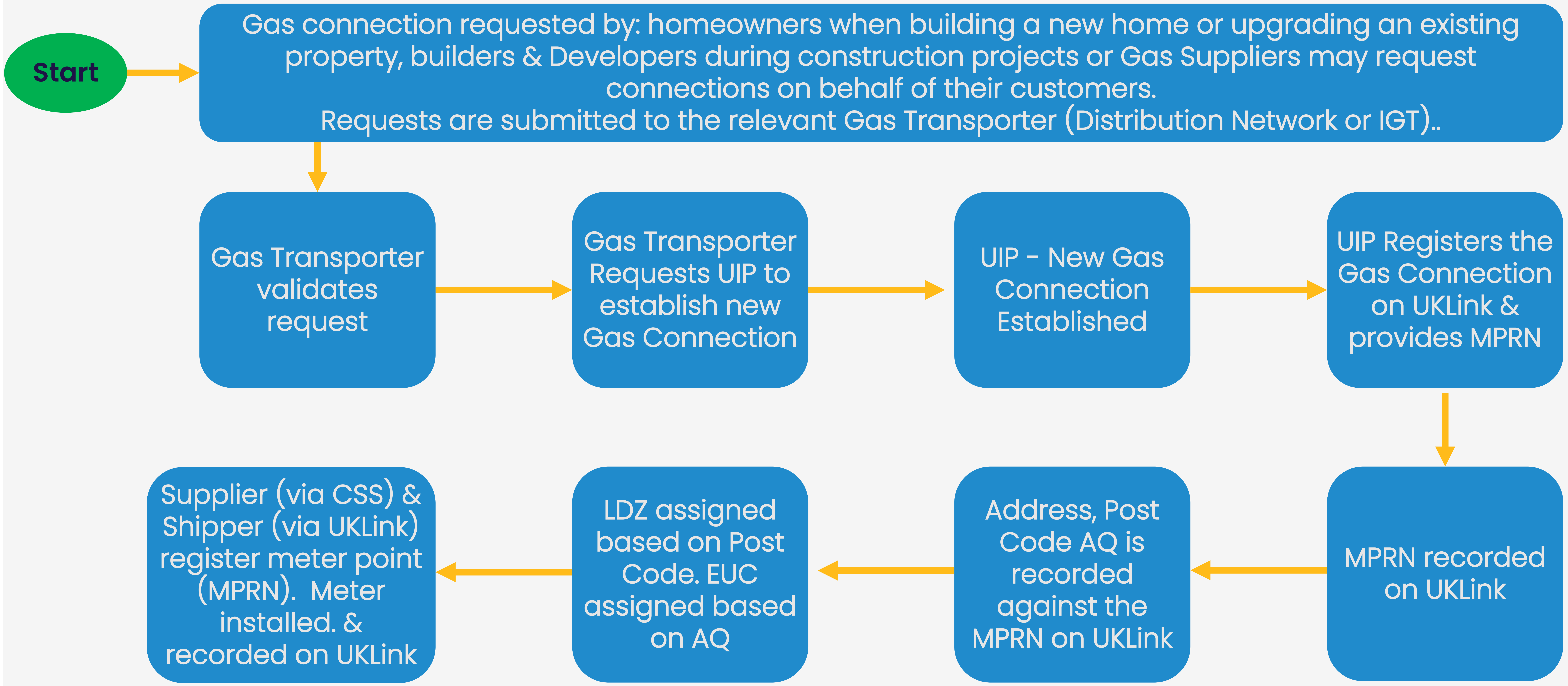
Current Meter Point Creation Process



UIP – Utility Infrastructure Provider

MPRN – Meter Point Reference Number

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Uniform Network Code Assessment

UNC Assessment

- All government regulation documents & UNC sections have been checked to identify any regulations / obligations relating to Calorific Value (CV) or Flow Weighted Average Calorific Value (FWACV).
- The sections identified may not need to be changed but may need to be considered when raising a Modification as a result of RTSM.
- No changes were identified in The Independent Gas Transporters Arrangements Document (IGTAD)

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General Terms Section C (GTC)

- Interpretation 3.2 Units and other terms
  - Describes the metrics required for the CV as set out in ISO6976-1995(E)

- Interpretation 3.3 Calorific Value
  - States how flow weighted average calorific value is the average of the average calorific values (applicable to the area in which such System Exit Point or Inter-System Offtake is located, weighted by reference to the gas flows each Day at points on the relevant System where apparatus referred to in that Part is located.

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Offtake Arrangements Document (OAD)

- Section D Measurements
  - Describes determining the daily CV for the LDZ & the Specified Range" & "Permitted Uncertainty Level" for CV
- Section F Determination of Calorific Value 1.2 Daily CVs
  - States that each GDN is required to determine daily CVs for its charging area & each LDZ represents a single charging area
- Section F Determination of Calorific Value 2. CV Shrinkage
  - Obligations on National Grid for calculation of CV shrinkage which is treated as arising in the NTS and is part of NTS Shrinkage. CV shrinkage arises in circumstances where the average calorific values diverge to such an extent that area calorific value exceeds the lowest of such average calorific values by more than 1MJ/m3
- Section F Determination of Calorific Value 4. Arrangements for Determination of Daily CVs
  - GDN shall provide a full description of the basis on which daily CVs in respect of its LDZ are to be determined
  - If a GDN proposes to make a change to the basis on which daily CVs are determined, the GDN shall give not less than 6 months notice. A change includes the definition of a charging area

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Transportation Principal Document (TPD)

- Section H 1.3 Demand Models
    - Demand Model may estimate demand (for all relevant System Exit Points) based on the flow weighted average calorific value

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Links to Further Training Material and Information

- Demand Estimation:
- Gas Nominations & Allocations
- Unidentified Gas (UIG)
- Submission & Processing of Meter Readings
- Annual Quantity (AQ)
- List of all Stakeholders registered on UKLink
- Understanding the Gas Industry

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