



## **H100 Fife Project – Hydrogen Network Demonstration**

High Level System Solution  
Impact Assessment

# Change Overview

## XRN5298 – H100 Fife Project – Hydrogen Network Trial

SGN's strategic ambition towards Net Zero includes a network innovation, 'proof of concept', demonstration project; H100 Fife. This demonstration will see SGN injecting 100% hydrogen into a new, purpose-built network which will be located parallel to the existing natural gas network. Initially around 300 existing domestic consumers will be invited to opt in and migrate their supplies from natural gas to hydrogen for their energy requirements.

The Calorific Value (CV) for existing natural gas customers is between approx. 35 and 43 MJ/M3 whereas the CV for hydrogen is approx. 2 MJ/M3.

To allow SGN to demonstrate that hydrogen can be used as an alternative to natural gas we need to ensure that parties (Shippers/Suppliers/End Consumers) are not negatively financially impacted by the difference between the hydrogen CV and natural gas CV.

Xoserve will need to consider a solution that will adjust metered hydrogen volume into energy (kWh) whilst being cognisant of the existing processes e.g. meter reading, switching and daily LDZ CV.

## Solution Options

1

Use the Hydrogen CV to reverse calculate the volume that would have been used had the meter been flowing Natural Gas and apply a consumption adjustment to override the volume in CDSP systems

2

Amend the Multiplication Factor within the volume to energy calculation

# Option 1 - High Level Impact Assessment

## Use the Hydrogen CV to reverse calculate the volume that would have been used had the meter been flowing Natural Gas

### SAP ISU:

- Network innovation flag (NTINOV\_IND) will be re-used to flag the H100 Fife demonstration sites
- New interface/File to be designed to receive and store declared or daily CV values for impacted sites from SGN.
- Custom table to store the daily Hydrogen CV values for the sites identified for trial
- Code changes to existing FM to calculate energy based on Hydrogen CV and store it on existing standard and custom tables for use of downstream processes such as AQ and Amendment Invoices.
- Changes required in supporting information if Hydrogen CV is to be sent for LDZ sites.
- New interface to notify the Hydrogen CV to the Shippers daily.

**AMT Marketflow and SAP PO:** New interface/file to be designed in SAP PO to receive the Hydrogen CV from SGN

**Gemini:** CON file will be received with LDZ CV only for Class 2 sites. Class 3 & 4 are not impacted. Regression testing in Gemini to ensure end to end flow up to energy balancing and UIG process

Impacted Systems		Assumptions
		<ul style="list-style-type: none"> <li>• Solution applicable for Class 2, 3 &amp; 4 sites only.</li> <li>• CV values will not be received at MPRN level. It will either be a constant value for all sites or value at LDZ level</li> <li>• No changes to Gemini are considered as part of this assessment, Gemini system will be receiving the energy via CON file as per the existing BAU logic for these sites as well.</li> <li>• File format will be agreed with industry stakeholders</li> <li>• During detailed design phase, mechanism to receive/send files via IX/EFT or Email template will be finalised.</li> <li>• Network innovation flag (NTINOV_IND) is already getting extracted to BW.</li> <li>• If daily CV reduction data not received, use default D-1 CV.</li> <li>• Market trial costs are not considered and any changes to the requirement will impact the overall cost</li> <li>• Manual efforts for business user for Gemini offline adjustment need to be considered outside of this assessment.</li> </ul>
Overall Impact	Release Type	High Level Cost Estimate
Large	Major	120,000 to 200,000 GBP

# Option 1 - System Impact Assessment

1

	Reports	Interface	Enhancements	Workflow
<b>System Component:</b>	n/a	AMT Market flow/PO/ISU	SAP ISU	n/a
<b>Impacted Process Areas:</b>	n/a	New Interface design	Reads & Billing	n/a
<b>Complexity Level (per RICEFW item):</b>	n/a	High	High	n/a
<b>Change Description:</b>	n/a	<ul style="list-style-type: none"> <li>Design &amp; Build new interface in Marketflow , SAP PO and ISU</li> <li>File/field level validations to be agreed during DD for build</li> <li>Build for Response file</li> <li>3 interfaces (CV inbound &amp; its response; notification to Shippers)</li> </ul>	<ul style="list-style-type: none"> <li>Custom table to store the daily Hydrogen CV</li> <li>existing CA tool to calculate energy based on Hydrogen CV</li> <li>Code changes to read processing, energy calculation and SI generation</li> <li>ISU report to identify MPRNs by fuel type and Project Name</li> </ul>	n/a

	BW	PO/Marketflow	ISU	Gemini
<b>Test Data Prep Complexity:</b>	Low	High	High	Medium
<b>Unit and Sys Test Complexity:</b>	Low	Medium	High	Medium
<b>Pen Test Impact:</b>	No	Yes	Yes	No
<b>Regression Testing Coverage:</b>	Low	Low	High	Low
<b>Performance Test Impact:</b>	No	Yes	Yes	No
<b>Market Trials:</b>	No	No	No	No
<b>UAT Complexity:</b>	Medium	High	High	Medium



# Option 2 - High Level Impact Assessment

## Amend the Multiplication Factor within the volume to energy calculation

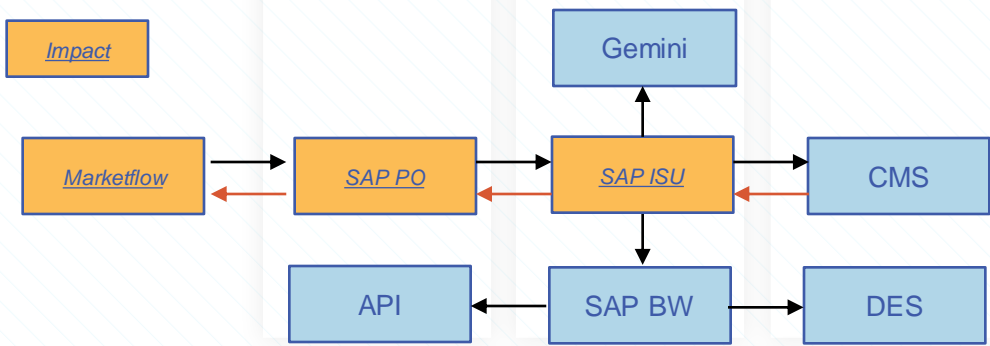
### SAP ISU:

- Network innovation flag (NTINOV\_IND) will be re-used to flag the H100 Fife demonstration sites
- Where the meter is capable of flowing both Hydrogen and Natural Gas a new program to be used to install Hydrogen gas meter and set the multiplication factor as part of initial RGMA activity, same will be used to move customers onto their last recorded multiplication factor in case when the meter is no longer flowing Hydrogen.
- Changes required in RGMA logic to not to amend the Multiplication Factor values for sites with Hydrogen Multiplication Factor. New Rejection code to be introduced to reject RGMA requests for any further updates on H100 Fife sites.
- New file format to notify the Shippers & SGN on hydrogen meter installation and multiplication factor update for H100 Fife sites
- Extensive regression testing required for all the files where multiplication factor is issued such as portfolio files, registration files, reads, SI along with downstream applications such as BW, DES

**SAP BW:** Any changes in ISU as part of master data set up, will flow to BW automatically as part existing extractor routines

**AMT Marketflow & SAP PO:** New interface/file to be designed in SAP PO to notify SGN and Shippers.

Impacted Systems	Assumptions
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- Set up for Hydrogen meter MDD data will follow existing BAU route and efforts not considered as part of this assessment
- Read processes will use the hydrogen Multiplication Factor for tolerance validation and volume/energy calculation
- Amendment supporting information shows the Hydrogen Multiplication Factor.
- Network innovation flag (NTINOV\_IND) flag will be set/removed by business users and ad hoc instance for new program will be triggered.
- NTINOV\_IND is already getting extracted to BW as part of existing functionality.
- During detailed design phase, mechanism to receive/send new files via IX/EFT or Email template will be finalised.
- Market trials costs are not considered and any changes to the requirement will impact the overall cost
- These efforts are based on very high level analysis, based on the discussion for requirement and solution, the stated efforts may change
- Option will impact RGMA processes and code objects already impacted by CSS.

Overall Impact	Release Type	High Level Cost Estimate
X-Large	Major	175,000 to 300,000 GBP

# Option 2 - System Impact Assessment

	Reports	Interface	Enhancements	Workflow
<b>System Component:</b>	n/a	AMT Market flow/PO/ISU	SAP ISU	n/a
<b>Impacted Process Areas:</b>	n/a	New Interface design	RGMA & AQ	n/a
<b>Complexity Level (per RICEFW item):</b>	n/a	High	High	n/a
<b>Change Description:</b>	n/a	<ul style="list-style-type: none"> <li>Design &amp; Build new interface in Marketflow , SAP PO and ISU</li> <li>File/field level validations to be agreed during DD for build</li> <li>2 interfaces (notification to Shippers &amp; SGN)</li> </ul>	<ul style="list-style-type: none"> <li>New program for H100 to Multiplication factor update and reinstate</li> <li>Enhance RGMA validation framework, new rejection to be introduced</li> <li>ISU report to identify MPRNs by fuel type and Project Name</li> </ul>	n/a

	BW	PO/Marketflow	ISU	Gemini
<b>Test Data Prep Complexity:</b>	Low	High	High	n/a
<b>Unit and Sys Test Complexity:</b>	Low	Medium	High	n/a
<b>Pen Test Impact:</b>	No	Yes	No	n/a
<b>Regression Testing Coverage:</b>	Low	Low	High	n/a
<b>Performance Test Impact:</b>	No	Yes	Yes	n/a
<b>Market Trials:</b>	No	No	No	n/a
<b>UAT Complexity:</b>	Medium	High	High	n/a

