



Consultation 54 report



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1 Introduction

From the 18th of October 2021 until the 8th of November 2021 included, Fluxys Belgium consulted the market on its proposed changes in the regulatory documents.

The proposed modifications in the regulatory documents aim at:

- (i) Changes to the Standard Transmission Agreement, Access Code for Transmission and Transmission Program
 - a. Allowing injection of H₂ into the Natural Gas network ;
 - b. Completing the gas quality specifications with an upper limit of 2% for H₂ ;
 - c. Clarify CO₂ specifications at Domestic Point for Injection ;
 - d. Aligning the availability of the H→L Conversion Service with the physical conversion program ;
 - e. Changing the L/H Capacity Switch Service to L Capacity Switch Service allowing to switch both Entry and Exit Transmission Services on L gas ;
 - f. Removing the table containing the monthly Imbalance Smoothing Allocations ;
 - g. Technical changes.
- (ii) Changes to the Standard Connection Agreement End Users
 - a. Update of the gas quality specifications ;
 - b. Information on exit capacities subscribed by the Network User ;
 - c. Alignment with the Standard Connection Agreement Local Producers.

With regards to H₂ injection, the potentially impacted End Users will be informed when concrete projects (i.e. connection requests) of H₂ injection are identified.

2 Consultation process

Fluxys Belgium launched this market consultation by publishing the proposed documents on its website - at the usual location for such consultations, supported by an announcement on the homepage - and via direct e-mailing to all registered market participants and associations. During the period from October 18th until November 8th (included), stakeholders were invited to submit their written feedback and if needed, seek additional information through bilateral contacts with Fluxys Belgium.

Taking into account the different comments received, Fluxys Belgium submits for approval to the CREG, the so amended version of the Standard Transmission Agreement, Access Code for Transmission, Transmission Program and Standard Connection Agreement End Users.

3 Outcome of consultation process

All comments received are listed and individually treated in the "Q&A's", included in the consultation report submitted to the CREG – see appendices.

Feedback was received from 4 individual Network Users and 2 representing organization, FEBELIEC and Febeg.

3.1 Wobbe index stability criteria

In the consultation documents, Fluxys Belgium proposed a reduction of the CO₂ specification from 2,5 % to 0,5 % at a Domestic Point for Injection, as a mitigation measure to decrease Wobbe Index variations in downstream network, when such variations arise from the connection of that Domestic Point for Injection. 2 respondents disagree with that proposal arguing that it would significantly increase the gas reprocessing process difficulty and costs, especially for biomethane plants. They propose to limit the decrease to 2% of CO₂.

On the one hand, Fluxys Belgium recognises that this proposal might influence process complexity and costs for Local Producers. However, on the other hand, it is important to consider that gas quality variations are of major concern for End Users as it might affect the efficiency and the emissions of their processes as well as their product quality. As a consequence, in order to improve the acceptability of decentralized compatible gas injection, which is a key enabler for the energy transition, Fluxys Belgium wants to keep the gas quality variations (in particular the Wobbe Index) related to the decentralized injection of compatible gas under control.

The biggest Wobbe Index variations are generated when the Wobbe Index from the gas injected at a Domestic Point for Injection significantly differs from the Wobbe Index of the gas already flowing into the network, even when both gases respect the gas quality specifications set forth in Access Code for Transmission Attachment C4. The most efficient way to avoid large Wobbe Index variations is therefore, where necessary, to align the Wobbe Index of the injected gas to the Wobbe index already flowing into the network in the vicinity of the Domestic Point for Injection.

Fluxys Belgium's recognizes that a change of the CO₂ specification is not the only option available to increase the Wobbe Index. Local Producers could also, amongst other, reduce N₂, H₂ or O₂ levels or add C₃H₈ into the gas before injection. Therefore, Fluxys Belgium is proposing a new text to allow such alternative ways to adjust the Wobbe Index to the desired level.

3.2 Adaptation of services offered on the L-gas network

The Network Users and the representing organizations are supporting the changes introduced for the Quality Conversion H to L, L/H Capacity Switch Service and Monthly Imbalance Smoothing Allocations. It is desirable to maintain services and a level of flexibility as long as possible, to reduce the number of changes to Monthly Imbalance Smoothing Allocations and announce them as much as possible in advance. Fluxys Belgium recognises this and will try to do so as much as possible. A demand was made to make the Quality Conversion H to L available for short term usage, Fluxys Belgium made an assessment on it and has therefore made some changes to the consulted documents before submitting them to the CREG.

3.3 H₂ injection into the natural gas network

This consultation 54 aimed to give market participants the opportunity to comment on the way Fluxys Belgium proposes to implement the blending of H₂ in the natural gas transported in its network, in particular via the introduction of a new Installation Point (H₂-IN), the adaptation of the Quality Conversion Service and the addition of a H₂ specification in the gas quality requirements.

The principle of blending has been established in Directive n° 2009/73, whose article 1 (2) provides that its provisions “shall also apply in a non-discriminatory way to biogas and gas from biomass or other types of gas in so far as such gasses can technically and safely be injected into, and transported through, the natural gas system”. H₂ falls within those other types of gasses which can be blended with natural gas while the blend itself would still qualify as “natural gas” in the sense of Article 1, 2° of the Belgian Gas Law (“any gaseous fuel product consisting predominantly of methane from underground sources, including liquefied natural gas, abbreviated as “LNG”” - our underlining). The above provision of the gas Directive was implemented in Article 2, § 4 of the Belgian Gas Law by a law of 8 January 2012, which reproduces its wording and adds the condition that the (natural) gas quality requirements applicable on the natural gas transmission network must be respected (GCV, Wobbe Index, H₂S and Stot). The definition of “natural gas” in the Belgian Gas law (as reproduced above) was modified by a law of 18 May 2021 with the explicit aim to encompass blends (55K1902002 (lachambre.be)).

The Gas Law doesn't define explicitly the maximum allowable percentage of H₂ in natural gas but subjects the addition of H₂ to the compliance of the resulting blend with existing natural gas quality requirements. The maximum allowable H₂ percentage is thereby implicitly limited by the minimum requirement on GCV. However, Fluxys Belgium believes that an explicit specification for H₂ would better meet market needs and therefore has proposed, in line with the informative annex on H₂ of the European Standard on the H-Gas Quality (EN16726 : 2016) and with the Synergrid technical requirement G8/01¹ (revision ongoing, no change on the H₂ specification), to set the specification at maximum 2% H₂.

In addition to the above it must be noted that the draft recast of the Gas Regulation that has been published by the European Commission on 15 December 2021 foresees in its Article 20 that “Transmission system operators shall accept cross-border flows of gasses with a hydrogen content of up to 5% by volume from [1 October 2025]”, which confirms the admissibility of blending and, for the first time, introduces an European harmonised maximum cap. The 2% H₂ specification proposed by Fluxys Belgium in this consultation fits in this longer term pan-European vision.

The question as to whether blending should be allowed or not is out of the scope of the current consultation. This has already been decided – with a positive answer in favour of blending – in the 2009 gas Directive as stated above. The object of the present consultation is to comment on the proposed implementation of such blending in the regulatory documents. Therefore, no answer shall be provided to comments which challenge the very principle of blending by injecting H₂ in the natural gas transmission network.

Please note that no H₂ is injected in the Belgian natural gas network at the time being nor it is delivered in significant quantities² by adjacent TSOs at interconnection points where it is currently considered as an impurity in interconnection agreements. Gas chromatographs located at interconnection points IZT, Eynatten and VIP Bene have shown that H₂ is only present in the ppm range. In line with decision B2191 taken by the CREG on the 11th of March 2021 on the Connection Agreement for Local Producers

¹ Already applicable for Local producers biomethane pursuant to Standard Connection Agreement Local Producers

² H₂ can be naturally present in some natural gas in the ppm range

(§43), Fluxys Belgium shall inform the concerned end users for each individual connection request received from a Local Producer, or in case natural gas containing H₂ is expected to be delivered at interconnection points by adjacent transmission system operators.

One respondent considers that it is not clear whether Fluxys Belgium's proposals aim at a one-off increase of the allowed H₂ content in the grid to 2% , or if it is the intention to further increase this upper limit in the coming years.

This consultation aims at implementing the regulatory framework to allow the injection of up to 2% of H₂ into the natural gas network. Fluxys Belgium believes that it is an important step in the energy transition as it supports the developments of the H₂ economy but also the possible development of other innovative renewable gasses (i.e. from gasification processes). Fluxys Belgium has no plan at this stage to further increase the allowed H₂ content in natural gas. While there is room to further increase the percentage of H₂ in natural gas according to the Gas Law, this mostly depends on market demand and restrictions, as well as on applicable EU regulations. At this moment in time, the vision of Fluxys Belgium is that when significant additional H₂ volumes arrive on the market, its applications in pure form should be prioritised over blending into natural gas.

The same respondent wonders if the potential impact of higher hydrogen shares in the natural gas used for electricity production on the turbines' efficiency has been thoroughly assessed. This comment shall be answered at later stage if higher shares of H₂ in natural gas are effectively considered in the future.

Two respondents requested information on the status of harmonization with neighbouring TSOs with regards to admixtures of natural gas with H₂.

At the time being, there is no agreement with neighbouring TSOs and SSOs to exchange blends of natural gas with H₂ on interconnection points and at Loenhout. Indeed, given the meshed nature of Fluxys Belgium's gas network, the H₂ delivered on one interconnection point might reach all other interconnection points. Consequently, an agreement between Fluxys Belgium and all its neighbouring TSOs (formalized through an update of the relevant interconnection agreements) is a prerequisite to the acceptance of a natural gas and H₂ blend at any of our interconnection points. Fluxys Belgium does not expect such agreements to take place in the near future, except if it is made binding through EU regulation.

Consequently, injection of H₂ in Fluxys Belgium's gas network shall be limited in the meantime to portions of the network that are not connected to neighbouring TSOs or SSOs. Applicable gas quality requirements at interconnection points and Loenhout have therefore not been amended in the Attachment C4 of the Access Code for Transmission.

One respondent points out that a 2% H₂ limit in the gas network is not in the specifications of some gas turbines in the market and that an increase of the H₂ limit would require further analysis for validation by the original equipment manufacturers. Another respondent argues that a 2% H₂ content might be too high for certain end users and therefore potentially impacts the normal exploitation of their assets, as well as their long-term maintenance planning and costs. Another party argues that TSO should be obliged to receive necessary approvals from end users showing that their infrastructure is compatible with the presence of H₂.

Fluxys Belgium recognizes that all end users might not be ready yet for the delivery of a gas containing up to 2% of H₂ in terms of operations and maintenance, and that the specifications of some gas applications currently in use in Belgium might not be explicitly applicable for 2% H₂ in the natural gas. Therefore, further analysis and evaluations with original equipment manufacturers and related time and resources might indeed be needed.

To date, several studies have already been conducted on the readiness of the whole gas value chain for blends of natural gas with H₂. There seems to be a technical consensus on the fact that the vast majority of gas applications are able to cope with blends of natural gas with up to 2% H₂ with limited adaptations (see for example: infographic Marcogaz). The technical possibility to increase the H₂ content into the supplied natural gas is recognized by a respondent.

This is why, in line with decision B2191 taken by the CREG on the 11th of March 2021 on the Connection Agreement for Local Producers (§43), Fluxys Belgium shall inform the concerned end users in due time for each individual connection request received from a Local Producer so that they can make their analysis and evaluations, and properly reorganize their infrastructures, operations and maintenance. Fluxys Belgium does not believe explicit approvals from such end users are needed for the maximum allowable content of H₂ considered (2%).

With regards to the readiness of the natural gas network, while it is true that H₂ injection into natural gas networks raises some technological challenges and risks, these differ depending on the H₂ content considered and are very limited for the 2% of H₂ here consulted. Fluxys Belgium would like to reassure network users that no injection of H₂ shall be allowed in its natural gas network without appropriate studies and adequate testing of its network components' resistance and functioning.

Please note that Fluxys Belgium operates itself multiple gas turbines in compression stations on its network. The readiness of those gas turbines for natural gas containing up to 10% of H₂ has been studied end 2020. The main conclusions of that study for admixtures of natural gas with up to 2% H₂ are that:

- o All our gas turbines can be operated with very limited retrofitting costs and impacts on efficiency
- o A dedicated assessment (with original equipment manufacturers) is needed for each individual gas turbine

A question was also raised by a party on the expected sources of H₂ injection in the near future. There is no project of H₂ injection in Belgium that has already taken FID when preparing this consultation report. Nevertheless, an electrolysis project is being contemplated in the Zeebrugge area.

A respondent said that those network users who do not have any relation to the H₂ injected in the TSO gas grid, must be legally protected from gas quality changes and from the decrease of energy content.

Another respondent asks whether the proposed changes could increase the volatility of the gas composition.

Fluxys Belgium confirms that, generally speaking, increasing the number of supply sources, including (but not limited to) decentralised (renewable) supply sources might

increase the volatility of the gas composition. This is a consequence of the diversification of supply sources and the transition towards a decarbonized energy sector. However, as stated in the decision B2191 of the CREG on the Connection Agreement for Local Producers (§42), Fluxys Belgium will maintain a stable and predictable gas flow on its network in accordance with the applicable contractual and legal gas quality requirements, and will continue to inform its network users on the gas quality on its network.

The same respondent asked for more details on potential impact of the proposal on the other gas quality specifications while another party expressed concerns with regards to the frequency and intensity of H₂ content variations. Fluxys Belgium confirms that the already existing gas quality specifications will remain applicable. Injecting H₂ in natural gas mostly reduces the GCV (and in a lower extent the Wobbe Index). In terms of variations, Fluxys Belgium will continue to apply the current operational limits on GCV and Wobbe Index variations thereby limiting the intensity of H₂ content variations well below 2% during an hour. In our current operations, end users are informed by our dispatching centre in the rare occasions when such operational limits on GCV and Wobbe Index variations cannot be respected. Another important characteristic of the H₂ is that it diffuses into methane, meaning that the further an end user is located from the point of H₂ injection, the lower the intensity of the H₂ content variations are in the redelivered gas.

The frequency of gas quality variations has not been, until now, considered as a parameter to operate the natural gas network, nor has it been requested by end users. Along with the development of decentralised production, Fluxys Belgium is currently studying several tools to track gas quality variations into the network for the future, including those related to the H₂ content. However, it must be highlighted that this verification is not considered necessary for H₂ content variations below 2% H₂, especially when diffusion effect enters into play.

With regards to the decrease of the energy content, for percentages of H₂ below 2% as it is considered in the current consultation, there is almost no impact on the capacity of the pipelines meaning that the same energy content can be delivered to end users and network users.

A respondent considers that any cost directly or indirectly connected to grid adjustment for the transmission of admixtures of natural gas and H₂ should be borne exclusively by the users benefiting from it.

While Fluxys Belgium considers that the necessary steps undertaken in the framework of the energy transition, as it is the case of such proposal, benefit indirectly to the gas market as a whole, it recognizes that most of the costs related to the injection of H₂ into natural gas should be borne by the parties responsible for such H₂ injection. This is guaranteed through the application of the Quality Conversion to H service and its related tariff, on top of the entry tariff, to the network users delivering of H₂ on the natural gas network.

A respondent also considers that possible disputes regarding direct damages occurred due to H₂ being injected to the TSO grid must be resolved solely between the TSO that accepted H₂ injection into its grid and the corresponding Network user, responsible for the injection of such H₂.

Article 8 of the Standard Transmission Agreement on “operating conditions and quality requirements” already describes the roles and responsibilities of the TSO when accepting gas that is outside the gas quality specifications. There is no change proposed to that article, nor to the article 10 on the “liabilities”. In addition, Fluxys Belgium wants to emphasize that gas would only be considered out of gas quality specifications if the H₂ content goes over the new quality requirement of 2%.

Please note that, blending non-compliant gas with natural gas, and related responsibilities and liabilities, is not something new for Fluxys Belgium as it operates already multiple installations where blending is done, like for example the installations where N₂ or L-gas is injected into the natural gas to decrease the Wobbe Index of H-gas. Generally speaking, when Fluxys Belgium offers a service that includes some physical blending, it bears the responsibility on the gas quality of the gas mix resulting from such blending.

4 Appendices

4.1 ***Appendix I: Market consultation – public material***

4.2 ***Appendix II: Market consultation – confidential material***



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