



Bundesnetzagentur

Regulation of hydrogen networks

Results of the market consultation



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Short summary of responses

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1 Participation in the market consultation

On 10 June 2020, the German federal government published its National Hydrogen Strategy, which assigns an important role to hydrogen in the decarbonisation of certain industrial sectors (such as steel and chemicals) and the transport sector. Germany is also striving to become a leader in hydrogen technology.

Although aspects dealing with the infrastructure needed to achieve these aims are only dealt with briefly in the National Hydrogen Strategy, it is highly likely that the current natural gas infrastructure will play a major role. This gives rise to a number of questions as to the structure of the future hydrogen networks, whether they are to be subject to regulation and, if so, how. The Bundesnetzagentur launched a market survey in response to these issues on 13 July 2020, which ran until 4 September 2020, aside from some individual deadline extensions. It contained a comprehensive analysis of the current regulatory situation and a list of questions that has been published online at www.bnetza.de/wasserstoff.

More than 60 responses were received, some of them lengthy, and all of them have now been evaluated. The aim is to provide the government with the results to assist in the decision-making process and also to inform interested members of the public about the general picture. The statements of those participants that consented to publication and the summary are published on the above-mentioned website.

A total of 63 undertakings, associations, research institutions and authorities contributed to the consultation and provided their input.¹ Some responses were submitted on behalf of several undertakings. The number of responses far exceeded expectations. Thirty-three participants provided their consent for their responses to be published. Most contributions were very detailed, with the associations in particular providing comprehensive responses.

In addition to the expected responses from the energy sector (BDEW, VKU, FNB Gas, DVGW, INES, individual network operators, trading houses, etc), industry representatives (BDI, DIHK, VCI, etc) and manufacturers of heating systems also contributed. Future hydrogen users and current manufacturers and suppliers of hydrogen submitted responses as well (eg the industrial gases association IGV). From the public sector, four ministries responsible for this issue took part.

Representatives of the field were unanimous in welcoming the opportunity to participate in the consultation, which they judged to be the first step in implementing and concretising the National Hydrogen Strategy. The stakeholders stressed the importance of taking the next steps on the basis of the results of the market survey.

Some responses focused on the details of the situation analysis, which did not relate directly to the questions set out by the Bundesnetzagentur. There were a few corrections, including one indicating that a quotation had been used out of context. One respondent believed that a study had been misinterpreted.

¹ One association published its position directly once the consultation had ended and merely referred to the consultation. This contribution to the debate has been taken into consideration as far as possible but has not been included in these figures.

The Bundesnetzagentur has taken note of this feedback and used it in its internal considerations, but does not plan to alter the text of the situation analysis retrospectively. This would change the context in which the questions were posed and answered, making it more difficult to situate this evaluation and the responses that can be published.

Moreover, that section was used by many stakeholders as an introduction and to state their own position. For that part, in particular, there were many duplicated answers to the questions, making it impossible to provide a detailed assessment of individual positions here. For example, many responses to individual questions pointed to the necessity of a suitable legal framework.

The respondents may be divided into the following categories (including associations and individual undertakings):

Categories of respondents

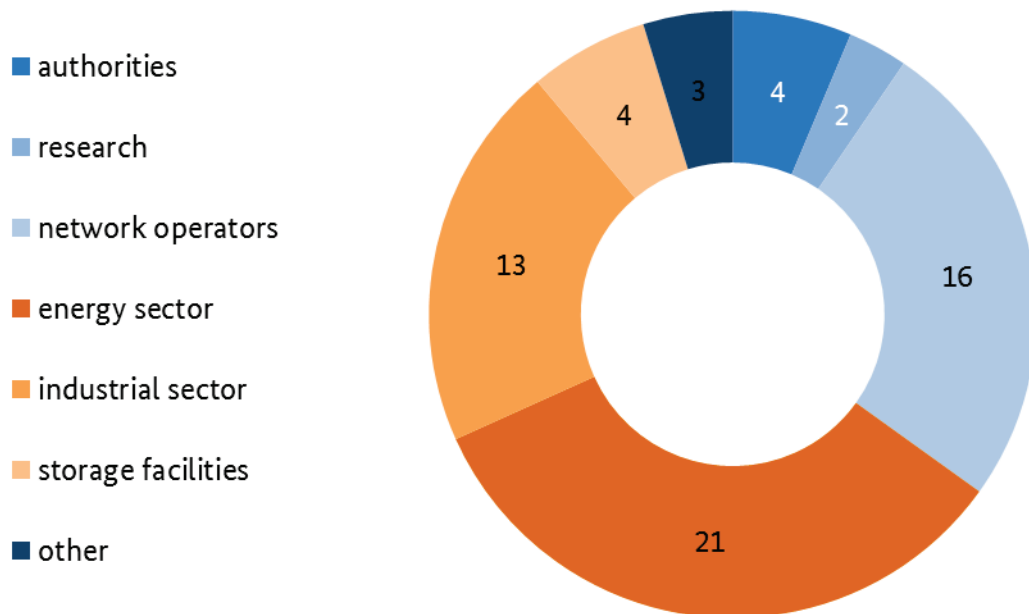


Figure 1: Categories of respondents

As was to be expected, most responses came from network operators, industry and, of course, the "general" energy sector.

If respondents are divided into associations and individual undertakings, this is the result:

Breakdown of respondents

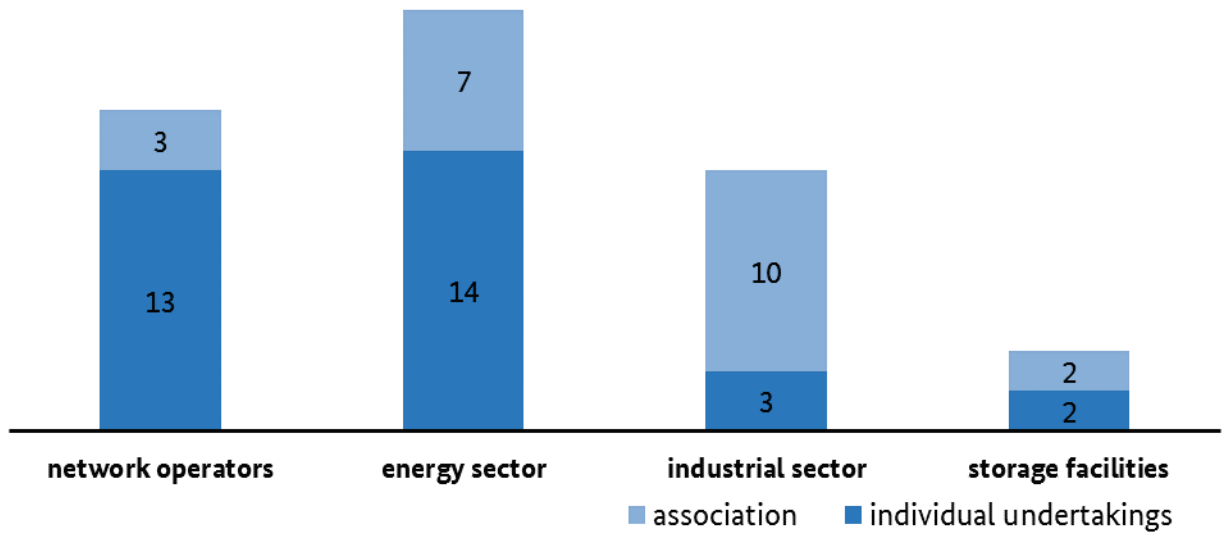


Figure 2: Breakdown of respondents

Many network operators, particularly from the distribution system sector, took the opportunity to submit their own response in addition to the contributions made by industry associations.

All respondents addressed the questions asked, with 22 of them adding remarks about the content of the situation analysis.

The number of responses to the individual questions may be broken down as follows:

Number of answers per question

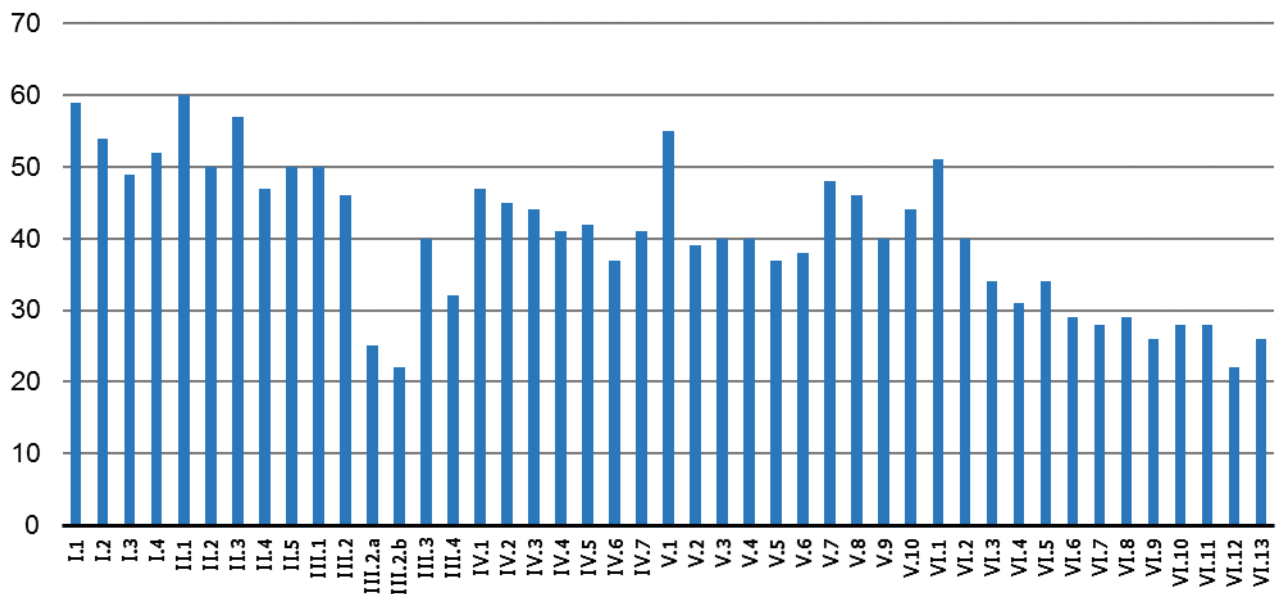


Figure 3: Number of responses per question

The greatest number of answers were on the fundamental questions on the admixture rules, the likelihood of the infrastructure scenarios occurring, the introduction of regulation, priority input according to type of generation, cost attribution, etc. The viewpoints taken were very different. In any case, the responses showed that the Bundesnetzagentur had addressed important points in its list of questions.

2 Summary of results

The market consultation on the regulation of hydrogen networks took place from 13 July to 4 September 2020. The Bundesnetzagentur received 63 responses to the consultation. The respondents made up the whole range of possible stakeholders in a future hydrogen market, in particular industry associations, network operators, energy utilities, storage facility operators, industrial undertakings and energy service providers. The list of questions was divided into six sections with a total of 43 individual questions.

Question section I: rules on injecting hydrogen into natural gas networks

A very large number of stakeholders expressed their opinions on this issue. Despite the different areas of focus of the individual questions, the debate essentially centred on the basic question of whether there should be pure hydrogen networks or a hydrogen admixture in natural gas networks. Nearly all participants in the consultation expressed their views on this, with a mixed picture emerging.

Many responses viewed admixture as an expensive (partly because of the many adjustments necessary) and lower-quality use of the high-quality, pure hydrogen that was urgently needed to meet decarbonisation targets in the industrial sector. Admixing was regarded as, at best, a possible transitional solution until enough H₂ networks were available.

However, the opposing standpoint found an equal number of supporters, particularly among gas network operators. This view saw admixing at all network levels, but especially in the distribution network, as a fast means of decarbonising all sectors, primarily the heating sector. However, it was not generally expected for there to be a admixture of more than 10 to 20%. There were also comments about dealing with sensitive consumers, whose plants would have problems if the gas quality fluctuated and/or there was a high proportion of hydrogen. Many called for continued consideration of these customers, while many others argued in favour of supporting such customers to convert their plants so that they did not become a bottleneck for admixtures. Most responses judged the existing legal rules for the injection of hydrogen, especially the comparison to biogas, to be insufficient. It was considered necessary for hydrogen to have its own arrangements, although there were concerns about delays caused by the enacting of legislation.

Question section II: expansion of the use of hydrogen in the economy

The consultation asked about the likelihood of three infrastructure scenarios occurring:

- (1) local, closed networks (scenario I),
- (2) local, closed networks with individual transport lines (scenario II), and
- (3) dense distribution networks with individual transport lines (scenario III).

The majority of answers indicated that respondents were in agreement that, over time, the system would pass through all three scenarios. There were some comments that this would not be a uniform, sequential process everywhere; different scenarios would develop in different regions. A few respondents were critical, saying that the scenarios were incomplete. They stated that the importance of the heat market also had to be taken into account.

(Almost) all respondents expected cross-border transport of hydrogen to take place, so that a cross-border hydrogen network would also become necessary, at the latest from when scenario II came into effect.

For the most part, stakeholders expected the split of roles and activities between transmission system operators (TSOs) and distribution system operators (DSOs) to continue in the future "H2 world".

The general assumption was that all players (generators, network operators, consumers) would play an active role in the implementation of the infrastructure scenarios. Storage system operators were additional players. The current market roles would remain, although there were a few predictions of role changes caused by close links between electricity and hydrogen infrastructure (the latter can provide flexibility for the electricity system). Demand would prove the main driver for hydrogen transport.

On the issue of competition between natural gas and hydrogen, natural gas had the edge on price at the moment. Decisive factors in competition around hydrogen would be the development of the CO₂ price, technology neutrality, means of funding, progress in climate policy and the regulatory framework. However, the key point for climate targets would be CO₂ emissions, not generating technology.

Question section III: introduction of regulation for pure hydrogen networks

The majority of respondents agreed with the premise that regulation must be introduced if there was an abuse of market power or discrimination. Some stakeholders also maintained that regulation would be appropriate not only in those circumstances but due to other aspects as well, such as the tight time frame for achieving political objectives (especially climate targets) and security for investment decisions.

The majority of respondents were in favour of the introduction of regulation as they considered discrimination or the abuse of market power likely. Some were in favour of regulation being introduced gradually and dynamically following examination, rather than an immediate introduction of access and price regulation. In justification of access regulation, it was often said that there was a risk of refusal of access, particular if there was no unbundling.

For existing networks and as long as they continue not to fulfil the function of general supply, the majority was in favour of transitional or exceptional arrangements, including for the protection of legitimate expectations.

The main issues mentioned that could be resolved by the introduction of regulation were planning and investment certainty, compliance with operating licences under energy law and securing property use under civil law.

Question section IV: scope of possible regulation for pure hydrogen networks

It must first be noted that the term "unbundling" was not used consistently in all responses. Nevertheless, the majority of responses were in favour of transferring the existing access and price regulation and unbundling rules. It was stressed, however, that specific adjustments would have to be made for hydrogen and in particular it should be borne in mind that the hydrogen market was just getting underway and could be inhibited by over-regulation. Network operators, authorities and industry representatives thus all argued in some cases for dynamic rules that could be updated with developments and for transitional arrangements to get the hydrogen market started.

Some industrial undertakings and network operators were in favour of simply expanding the definition of the term "gas" from the Energy Industry Act (EnWG), with individual representatives of the rest of the energy industry (traders, research institutions) supporting this suggestion. The contributions either referred directly to the proposal made by the TSOs or picked up on individual points from it.

A large group of stakeholders was also in favour of a completely new regulation of hydrogen under the EnWG, going beyond an adjustment to the definitions. This group was made up of network operators, energy sector representatives (traders, generators, consultancies) and the industrial and storage sector. Many players supported the idea of enacting a specific law for hydrogen infrastructure but viewed this as impracticable for reasons of time.

Question section V: arrangements for connection, access and expansion of hydrogen networks

A slim majority of consultation participants was opposed to priority input for green hydrogen because of the need to develop the market quickly and meet industrial demand. Rather, the input should be non-discriminatory and technology-neutral.

From a technical perspective, priority connection or input could make sense in the event of congestion, but this type of congestion situation was not to be expected in the short to medium term. Investment certainty must also be ensured for installations injecting hydrogen. Many of the responses that argued against priority input for green hydrogen under the current conditions nevertheless acknowledged that prioritising the different types of hydrogen would make sense in the long term.

At the same time, another large group of stakeholders took the opposite view, stating that green hydrogen must be given direct priority in the interest of the energy transition.

Some respondents believed that it would be expedient to transfer the gas capacity model to hydrogen, in suitable form. Others, meanwhile, were more cautious with respect to the time frame and stated that this would only be necessary when the network infrastructure became more complex. Many could envisage the network usage and charging models for natural gas networks being used as a basis, but others argued that pure hydrogen networks needed their own rules, some of which would fit into the network access model for natural gas and some of which would be different.

Opinions were also divided on the issue of whether the allocation of hydrogen generators and consumers should be influenced. On one side, there were those that viewed an influence as logical, especially in the interest of the network. On the other, there were those that thought the market would solve the location issue itself.

On the topic of infrastructure planning, there was a very mixed picture, with some participants in favour of combining a hydrogen network development plan (NDP) with the natural gas one and others believing that a separate hydrogen NDP would make more sense, while still others thought it was too early to decide. It was clear that the overwhelming majority thought it necessary to integrate the network planning of electricity, natural gas, hydrogen and, in some cases, even heat.

As far the (future) role of storage facilities was concerned, it was unanimously stressed that these would continue to be necessary even in a CO₂-neutral gas market in order to balance out fluctuations between production, imports and demand, and that more storage would be needed as hydrogen production increased. The majority was in favour of regulatory treatment of these as for natural gas storage facilities.

Question section VI: possible financing options for hydrogen networks

The responses on possible financing options for hydrogen networks indicate that most respondents were in favour of cost-reflective charges that should be largely free of incentive mechanisms to steer hydrogen demand. Should this, with separate pricing of newly built hydrogen infrastructure, lead to prohibitively high charges, initial discounts or state support were suggested as solutions. Many stakeholders, in particular the network operators, called for common pricing of natural gas and hydrogen infrastructure on the basis of the existing regulatory regime.

There were differing views on whether the charging model should be structured differently when the market was getting established and later, when it was more stable. Special arrangements for the initial phase (discount, no benchmarking) were regarded as more necessary if the hydrogen infrastructure was priced separately than if there was common pricing of natural gas and hydrogen infrastructure. Support from the federal government or the EU was often seen as necessary.

The majority of respondents did not consider it possible currently to estimate the total costs of transforming the gas-bound energy supply to a pure hydrogen supply. However, it was clear that the total cost would largely depend on the extent to which existing natural gas pipelines could be subsequently used for hydrogen.

Many stakeholders thought that the greatest possible continued use of these lines would be a suitable means of avoiding unscheduled write-downs that would be a risk if the natural gas infrastructure was no longer needed and parallel infrastructure was built for hydrogen.

There was a mix of opinions on the application of the Incentive Regulation Ordinance (ARegV). Some were in favour of applying the ARegV, but others argued that it was not an adequate regulatory instrument for infrastructure that had to be newly built, as it was developed for existing networks. Some participants viewed the application of benchmarking as sensible, at least in the long term. There was also a range of different answers on the application of cost-plus regulation. Yardstick regulation was not seen as particularly useful.

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List of abbreviations

ARegV	Incentive Regulation Ordinance (Anreizregulierungsverordnung)
BDEW	Bundesverband der Energie- und Wasserwirtschaft e.V.
BDI	Bundesverband der Deutschen Industrie e.V.
DIHK	Deutscher Industrie- und Handelskammertag e.V.
DSO	Distribution system operators
DVGW	Deutscher Verein des Gas- und Wasserfaches e.V.
EnWG	Energy Industry Act (Energiewirtschaftsgesetz)
FNB Gas	Vereinigung der Fernleitungsnetzbetreiber Gas e.V.
IGV	Industriegasverband e.V.
INES	Initiative Erdgasspeicher
NDP	Network Development Plan
TSO	Transmission system operators
VCI	Verband der Chemischen Industrie e.V.
VKU	Verband kommunaler Unternehmen e.V.

Publisher's details

Publisher

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