INFORMATION AND WHITEPAPER 2026-06-18

Blending of hydrogen into natural gas grids

1. INTRODUCTION

In some debates on energy and climate policy, the option of blending hydrogen with natural gas in existing natural gas grids is being discussed. This debate, which is currently gaining momentum, takes place against the backdrop of various objectives, such as the introduction of green gas quotas or other support schemes, the integration of renewable energy into the grid, and the question of how the market ramp-up of the hydrogen economy can be supported in the short term. In this context, blending is sometimes seen as a pragmatic transitional approach to utilising existing infrastructure and integrating initial quantities of hydrogen into the energy system.

The aim of this paper by the National Hydrogen Council (NWR) is to examine the blending of hydrogen into natural gas grids from a systemic perspective. To this end, the physical and technical fundamentals, the technical possibilities and constraints, the economic and regulatory framework and the strategic implications are analysed. The focus here is on the question of what contribution this integration can actually make to the transformation of the energy system, under what conditions it can be carried out effectively, and what adjustments to the legal and regulatory framework would be required.

The paper deliberately distinguishes between transmission and distribution networks. On the one hand, the two network levels differ fundamentally in terms of their technical design, their integration into European structures and their user base. These differences form part of the assessment of the potential and limitations of hydrogen blending. On the other hand, it is already apparent at the conceptual level that, without a fundamental overhaul of the legal and regulatory framework, the blending of hydrogen into the gas grid – at both the transmission and distribution levels – is only possible within very narrow limits.

It should also be borne in mind that the blending of hydrogen cannot be analysed and assessed as an abstract concept; rather, the quantitative aspect always plays a prominent role, namely the question of exactly how large the blending component should be and what technical, economic, regulatory and strategic implications different levels of blending may have.

The challenges associated with hydrogen blending, which arise from technical and, in some cases, regulatory considerations, can be overcome through the methanation of hydrogen, enabling renewable methane – a substitute gas equivalent to natural gas – to be fed into the grid, transported, stored and utilised, while taking into account the implications (availability of sustainable carbon sources) and the effects on the efficiency of the supply chain as well as the costs. However, this option of changing the supply route goes beyond the issue of hydrogen blending discussed here and is therefore not addressed further in this context. The NWR has addressed this topic in the NWR whitepaper on eSNG.[1]

2. PHYSICAL AND TECHNICAL BASIS

The physical properties of hydrogen differ significantly from those of natural gas and are fundamental to understanding the possibilities and limitations of blending. In particular, hydrogen has a significantly lower volumetric calorific value (around a third of that of natural gas) and a lower density than natural gas. If hydrogen is compressed to the standard pressure of 200 bar used in gas storage facilities, its energy density falls to a quarter of its original value. At the same time, the addition of hydrogen affects key combustion parameters such as the Wobbe index, which is a decisive factor in the interchangeability of gases in existing applications.

The addition of hydrogen therefore alters the quality of the gas in the grid. Thus, a hydrogen content of 10 per cent by volume corresponds to an energy content of only around 3 per cent in the gas mixture. At concentrations of 20 and 30 per cent by volume, this energy content rises to approximately 7 per cent and 11 per cent respectively; at a blending of 2 per cent by volume, it is approximately 1 per cent. As the hydrogen content increases, the calorific value of the gas mixture decreases and its combustion properties also change. This may affect the operation and suitability of end devices, industrial applications and grid-related processes. Compliance with permissible gas quality ranges is therefore a key prerequisite for the safe and reliable use of gases and gas mixtures.

The lower calorific value has a direct impact on the climate impact of the blend. The potential reduction in greenhouse gas emissions is significantly lower than the volumetric proportion might initially suggest. With a hydrogen content of 10 per cent by volume – assuming that the hydrogen is either entirely low in greenhouse gas emissions or derived from renewable sources – the resulting reduction in emissions under the regulatory framework is only in the region of approximately 2 per cent. For blending levels of 20 and 30 per cent by volume, the corresponding reduction in emissions is approximately 4 per cent and 7 per cent respectively.

Against this background, it is crucial to distinguish between volumetric, energy-related and emissions-related effects when assessing the addition of hydrogen. An analysis of energy supply based solely on volume shares is too narrow and fails to adequately represent the actual systemic impact of blending.

[1] NWR Information and Whitepaper on eSNG (2025)

3. TECHNICAL POSSIBILITIES AND LIMITATIONS

3.1 LONG-DISTANCE GRID: TECHNICAL POSSIBILITIES AND LIMITATIONS

The scope for blending hydrogen into the transmission network is severely limited by a number of technical, systemic and regulatory factors. The German transmission network is closely integrated into the European gas transmission system and plays a key role in crossborder gas transmission. Against this background, national blending solutions must be compatible with the gas quality requirements in other European countries. In practice, differing national regulations mean that the permissible hydrogen content in the transmission network is effectively limited to very low levels – in some cases, to 0 per cent by volume and, in many instances, to a maximum of around 2 per cent by volume, as is also the case in Germany. There is greater flexibility when it comes to import pipelines from third countries into the EU.

Another limiting factor stems from the requirements of the connected largescale consumers. Industrial applications in particular – such as those in the chemical, refining or glass industries – rely on a predefined and stable gas quality with consistent combustion properties. In the chemical industry, for example, around 25 per cent of the natural gas used is employed as a raw material in production processes, which typically require very high purity grades. Even slight fluctuations in the composition of the gas can lead to significant disruptions in the production process. Depending on the specific plant technology, hydrogen concentrations above approximately 2 per cent by volume can trigger safety shutdowns, thereby causing production stoppages or damage to the production plants.

Furthermore, due to the nature of the system, it is virtually impossible to guarantee a technically safe and predictable injection into the transmission network. Hydrogen is often fed into the grid in a fluctuating manner – particularly where there is no intermediate storage facility – and can be injected at various points in the grid. At the same time, gas transmission is subject to changing flow directions and widely varying transmission volumes. Grid operators have no direct influence over the use and booking of feedin points. These factors often mean that it is not possible to maintain a constant hydrogen content in the network or in sections of the network. Seasonal factors exacerbate this problem. During the summer months, when transport volumes are lower, permissible concentration limits may be exceeded more quickly, whilst in the winter months, high throughput rates lead to dilution, resulting in the actual blending ratios falling short of the target levels.

From a grid operator's perspective, too, the injection of hydrogen presents additional challenges. Compressor plants, whose gas turbines often use the gas being transported as fuel, are not generally designed to handle the increased hydrogen content. Operating outside the specified gas quality ranges may affect existing manufacturer approvals and warranties, and may also lead to increased wear and tear.

After all, there is currently no standardised and binding limit for the permissible hydrogen content in the German transmission network. Whilst the technical regulations provide a framework for assessment, they rely on case-by-case evaluations and consultations. Such an approach is practically impossible to implement in a largescale, highly interconnected transport system. The need for individual agreements with a large number of network users and grid operators is virtually impossible to implement in practice; it would significantly increase complexity and thus presents a further structural barrier to the injection of renewable energy into the transmission grid.

3.2 DISTRIBUTION GRIDS: TECHNICAL POSSIBILITIES AND LIMITATIONS

When hydrogen is physically blended into the (distribution) networks, the hydrogen content that can be blended depends primarily on the compatibility of the relevant application technology (e.g., plant burners) in the respective grid area. Depending on the age profile and state of maintenance of the relevant systems (ranging from burners to vehicles fuelled by natural gas and their tanks), different blending ratios are possible from a technical point of view. These range from 0 per cent by volume (in specific industrial installations) to 2 per cent by volume (in the tanks of older natural gas vehicles) to levels of 20 or 30 per cent by volume in more modern equipment in the heating and commerce sectors.

At present, however, there is no reliable H_2 limit for existing gas appliances in the regulations from Deutsche Vereinigung des Gas- und Wasserfaches e.V. (a German technical and scientific association for gas and water, abbreviated as 'DVGW'). Without such a limit, the grid operator cannot carry out a reliable assessment. As a rule, the distribution system operator is not aware of the specific heating model, its compatibility or its interoperability. To avoid any resulting safety risks, a large-scale stocktaking measure would be necessary (possibly even involving individual inspections of heating systems), which would entail a correspondingly high level of effort to implement. In theory, data from maintenance logs or building energy registers could help with data collection; however, the latter is hampered by data protection laws and the fact that it has yet to be implemented. The individual inspection of combustion appliances could be compared to the ongoing transition from L-gas to H-gas across the market. Whenever there is a change in the hydrogen content that falls outside the previously specified blending range, these conversion measures would have to be at least reviewed, and possibly even carried out again. The time and financial resources required of distribution system operators are considerable; they may tie up resources for a temporary solution and, in some cases, hinder the development of dedicated hydrogen infrastructure.

For these reasons, it is difficult to assess the maximum hydrogen content in a blend that would ensure both a reliable gas supply and the smooth operation of grid customers' installations. This means that the issue of risk assumption and liability is currently neither quantifiable nor acceptable for distribution system operators.

With regard to calibration legislation, the strict requirements of DVGW G 685 (maximum deviation of 2 per cent in the billing month) and TR G 19 (maximum systematic deviation of 0.25 per cent) would need to be reassessed and, if necessary, adjusted in the event of blending.

Furthermore, seasonal variations are an important factor. The amount of hydrogen that can be injected into the natural gas grid depends on gas sales, which vary seasonally. In some circumstances, hydrogen production may also fluctuate seasonally. Domestic production of RFNBO-compliant, electricity-based, low-carbon electrolytic hydrogen is highly dependent on the fluctuating supply of electricity generated from renewable energy sources. The challenge lies in the fact that the blending ratio must be kept constant whilst taking both types of variation into account. Consequently, during periods of low natural gas sales – primarily in the summer months – only significantly smaller quantities of hydrogen can be blended in, although at the same time there may be a particularly high supply of hydrogen during the summer months. Under these circumstances, ensuring a consistent ratio of hydrogen to natural gas presents a considerable challenge.

In this regard, taking account of the existing grid infrastructure is also of key importance in ensuring a consistent hydrogen content. For natural gas grids with multiple feed-in points, there are, on the one hand, more extensive options for maintaining a consistent hydrogen content; on the other hand, complexity increases where ring network structures may be present and flow directions fluctuate.

3.3 SIDE NOTE: SEPARATION TECHNOLOGIES (IN PARTICULAR MEMBRANE PROCESSES)

Despite the expansion of renewable energy and ongoing electrification, Germany will remain an energy-importing country for the foreseeable future and will continue to rely on imports and the associated infrastructure for natural gas and hydrogen.

In this context, the blending of hydrogen can represent a short-term, flexible and cost-effective option for gradually adapting existing natural gas transport infrastructure and corridors to import renewable or low-carbon molecules from energy-exporting regions such as North Africa, Norway or the Caspian region.

The technology for extracting hydrogen from natural gas streams (deblending) is commercially available and is used, amongst other things, to separate substances contained in natural gas (e.g., H_e, H_2, CO_2). In existing natural gas import pipelines, hydrogen can be extracted from the natural gas stream at suitable points in the transport chain – using a combination of high-performance membranes and PSA – with a purity of up to 99.9999 per cent, and fed into the European Hydrogen Backbone or the German core network, or used directly on site.

The combined use of existing natural gas import pipelines for the transport of natural gas/hydrogen mixtures could significantly accelerate the ramp-up of the hydrogen market at an early stage, without having to rely on the cost-intensive, time-consuming and regulatory-intensive development of a nationwide hydrogen import infrastructure.

By blending it into the natural gas stream, larger quantities of hydrogen could be imported into Europe and Germany via natural gas pipelines. With the necessary adjustments, a complete switch to hydrogen would also be possible in the long term, which would ensure that the infrastructure could continue to be used flexibly even after natural gas imports have ceased.

Even though the widespread deployment of deblending technologies across the entire long-distance gas grid does not appear to be economically viable in the long term – for example, due to technical complexity, high energy requirements and declining efficiency with a low hydrogen content (≤2–10 per cent by volume) and the additional infrastructure requirements (including high pressures, redensification, plant scale), targeted use as a bridging and transitional technology at clearly defined handover points, such as import points or industrial hubs, may nevertheless be appropriate.

This option presupposes that existing natural gas suppliers or transport operators offer services or undertake projects relating to the production and pipeline-based supply of hydrogen. Although individual projects were set up for this purpose, these activities have since been discontinued.

4. REGULATORY REQUIREMENTS FOR CERTIFICATION AND CREDITING OF TARGETS

4.1 EUROPEAN REQUIREMENTS AND NATIONAL IMPLEMENTATION

The European regulatory framework sets out the conditions under which the renewable or greenhouse gas-reducing properties of hydrogen blended into the natural gas grid can be verified, accounted for and counted towards regulatory targets. RFNBO and low-carbon hydrogen each have their own certification pathways.

For RFNBO, the European framework is set out in the Renewable Energy Directive (RED) as amended by RED III. The relevant characteristics are generally verified using a mass balance system in accordance with Article 30(1) and (2) of the RED. This is supplemented by the guidance on targets for the consumption of renewable fuels of non-biological origin in the industry and transport sectors[2], which serves as an information document from the Commission. Mass balance tracking monitors the composition of energy flows throughout the entire value chain. This system allows sustainability-related attributes to be allocated for accounting purposes throughout the supply chain, provided that the certified volume is tracked in a proportionate and transparent manner. In Germany, the regulations were implemented in particular through the 37th Federal Immission Control Ordinance, which further specified the requirements regarding eligibility, verification, mass balance, certificates and certification bodies for RFNBO.

By contrast, the regulatory and certification framework for low-carbon hydrogen is still being developed. Directive (EU) 2024/1788, a component of the EU's Internal Market for Gas and Hydrogen Package, is the relevant legislation. This provides for the development of a consistent EU-wide methodology for determining greenhouse gas reductions for low-carbon fuels. The Commission has already presented a draft delegated act on this matter, setting out a life cycle methodology. Nevertheless, the practical certification of low-carbon gases at national level is currently not very well defined in regulatory terms.

Recertification is also required at the interfaces involved in sector coupling. If hydrogen is converted, mixed with natural gas, separated and reused following further processing, it must be possible to transfer, split or reissue certificates. There is a need for further regulation in this area to make blending solutions economically viable.

4.2 DISTINCTION BETWEEN BALANCING SYSTEMS: MASS BALANCING AND BOOK-AND-CLAIM

The choice of balancing system determines how the blend becomes tradable. Mass balancing follows the physical supply chain and only passes on sustainability characteristics within an interconnected system. It is currently the balancing method required under European law and is closely aligned with existing verification frameworks and the GHG emissions trading scheme. However, grid boundaries, market areas and differing national requirements may limit transferability. A change to the current legal framework is conceivable in principle, but would require a considerable investment of time and political commitment.

[2] Guidance on the targets for the consumption of renewable fuels of non-biological origin in the industry and transport sectors in accordance with Articles 22a, 22b and 25 of Directive (EU) 2018/2001 on the promotion of energy from renewable sources, as amended by Directive (EU) 2023/2413.

Book-and-claim separates the energy attribute from physical transport. Origin and GHG attributes can be treated independently of the molecular flow. This increases liquidity and facilitates a secondary market. The Netherlands demonstrates how practical classifications can be organised in this way. This requires robust mechanisms to prevent double counting, as well as measures to prevent the emergence of barriers to the development of dedicated hydrogen infrastructure – including networks and storage facilities – and to the development of services in the field of structuring.

These issues are particularly relevant in practice when hydrogen is injected into the natural gas grid. If the aim is to market the hydrogen component on the basis of its green or low-carbon characteristics, the hydrogen must be physically separated from the gas mixture for the purposes of mass balancing. The physical separation of hydrogen from the mixture is a complex process in the mass balance approach, whereas in the book-and-claim model it is not required. From a regulatory perspective, there are two options: to rely on existing mass balance structures in the short term, or to develop an independent certificate system for blending that is compatible with the European system in the medium term. A time-limited and clearly defined transitional phase – for example, until the infrastructure (particularly transport pipelines and hydrogen storage) is in place, which should be accompanied by a clear roadmap – can bridge both approaches and promote the ramp-up of hydrogen.

At the same time, however, the economic incentives arising from a book-and-claim model must also be taken into account. Compared with physical deliveries, the use of certificates does not incur any grid access charges, storage costs or structuring costs. From the perspective of hydrogen users, there is therefore initially no interest whatsoever in connecting to hydrogen infrastructure or in user-funded network and storage infrastructure or structuring services. If book-and-claim approaches are to be applied during the hydrogen ramp-up process (and changes to the relevant legal regulations are being sought), only conditional book-and-claim models (so-called 'smart book-and-claim') would therefore be suitable. The use of hydrogen certificates would therefore have to be restricted to those cases where no infrastructure is (yet) available within an acceptable geographical proximity; where appropriate, it might also be possible to levy surcharges on the use of certificates, which would correspond to grid access charges or structural costs, and which could be used to secure the incentives and contribution margins required for the development of physical hydrogen infrastructure.

4.3 TREATMENT OF ADMIXTURES IN THE EU ETS

As regards the EU ETS, the practical issue of emissions monitoring arises when hydrogen is blended into the fuel. Installations subject to the ETS must have their emissions measured, reported and verified in accordance with an approved monitoring plan. What is therefore decisive is not primarily the marketed characteristic of a gas stream, but rather how the fuel actually used is reflected in the monitoring in terms of emissions.

Where hydrogen is blended in, this gives rise to a need for methodological changes: The gas stream used has a varying composition and therefore a variable emission factor. Depending on the level and temporal distribution of the blend, it must be clarified on what basis the fossil and non-fossil components are to be accounted for in ETS monitoring. This suggests that a standardised and robust method should be developed for monitoring the quality of the mixed gas at the emission point.

The question of whether mass balancing is sufficient for this purpose, or whether elements of a book-and-claim system can be used as a supplement, is a particularly sensitive one in the context of the ETS. The ETS is generally based on the plant's actual emissions. It follows that certificates based purely on characteristics, without sufficient reference to the fuel actually used, are unlikely to be sufficient for ETS purposes. For recognition within the ETS, therefore, a system will be required that reliably links the composition of the gas stream used to the monitoring process. Certificates can support this monitoring, but cannot simply replace it.

The time horizon is also crucial when it comes to adjustments to the EU ETS. In the short term, case-by-case solutions are feasible through tailored monitoring plans, quality agreements and standardised documentation. For widespread ramp-up, consistent EU-wide guidelines are needed in the medium term regarding the treatment of blending in ETS applications in terms of balancing and emissions.

4.4 REQUIREMENTS SET OUT IN TECHNICAL STANDARDS AND REGULATORY FRAMEWORKS

Technical regulations provide the framework within which blending works in terms of physics. As well as the quality of the gas itself, interoperability – compatibility with infrastructure and connected applications – is a key factor. Both vary from grid area to grid area, which is why the regulations deliberately provide for an assessment framework rather than a fixed limit. European gas quality standards apply to the transmission network, whilst the DVGW regulations apply to the distribution network, in particular DVGW G 260 and G 294 Code of practice.

As long as there is no grid-wide framework governing the proportion of renewable energy to be fed into the grid, feed-in will remain dependent on local conditions and individual arrangements. Contractual agreements between feed-in providers, grid operators and downstream stakeholders increase transaction costs and delay projects. Alignment with European developments provides the crucial catalyst for growth; technical standards are what make blending viable in the first place.

Added to this are the EU taxonomy and its delegated acts. Both RFNBO and low-carbon hydrogen help to reduce greenhouse gas emissions. The categories recognised for crediting of targets, eligibility for funding or sustainability-related classification shape the business models and revenue prospects of investors and market participants.

Changes in gas quality have a direct impact on network access, balancing and billing. Calorific value, fuel composition and emission factors vary across the section of the network. Consistent standards make it possible to seamlessly integrate physical gas quality, energy balancing, sustainability certification and the treatment under emissions legislation.

5. ECONOMIC ASPECTS

The economic assessment of blending hydrogen into the natural gas grid is based on a number of different factors. Recognising the quantities of hydrogen blended into fuels for compliance purposes under the various (climate and energy policy) regulatory frameworks could result in a positive economic contribution. However, these contributions depend, firstly, on the climate-related blending effect (see section 2); secondly, on their recognition in the various regulatory frameworks (see section 4); and thirdly, on the time horizons that can realistically be expected in this context.

However, these economic benefits are offset by the costs of upgrading grid and customer installations, as well as the assessment of the associated risk-taking and liability issues. Furthermore, from an economic perspective, any delays or underutilisation of the dedicated hydrogen infrastructure that may arise must also be taken into account. In the short to medium term, hydrogen blending can help to reduce systemic costs to the economy by allowing existing gas infrastructure to continue to be used in its current form. It is crucial to avoid creating the wrong incentives that would be detrimental to dedicated hydrogen infrastructure, and to use blending where it makes systemic sense and is cost-effective.

It is only possible to a limited extent to weigh up the relevant economic considerations at an abstract level and without further detailed analysis. Nevertheless, it is possible to make some qualitative classifications.

In the transmission network, the cost–benefit ratio tends to be unfavourable, primarily due to the specific requirements that industrial customers place on the quality of the gas supplied. This severely limits the proportion of the mixture that can be injected into the transmission network, resulting in very limited emission reduction benefits, whilst entailing comparatively high technical adaptation and maintenance costs.

In the distribution network, however, depending heavily on local conditions (e.g., with regard to the homogeneity of consumers or the existing grid structures), better cost–benefit ratios could be achieved. Factors of relevance here include the potentially lower requirements of end users (particularly where no industrial customers or natural gas filling stations are being supplied) and, where applicable, the simpler grid structures (particularly where there are no multiple feed-in points or ring network structures to take into account). Precise control of hydrogen content through the local integration of electrolysis plants appears, in principle, to be possible; furthermore, connection to the natural gas transmission network and the hydrogen backbone network could enable such control. However, this also gives rise to additional administrative and transactional costs, which may no longer be of a minor nature. In distribution networks serving industrial customers, power stations or filling stations, the requirements regarding the product quality of the gas supplied – as described above for the transmission network – apply equally, and consequently the cost–benefit ratio is less favourable.

Membrane technology (particularly for hydrogen imports) represents a special case; it is primarily suitable as a standalone or interim solution (with the corresponding economic consequences), provided that potential hydrogen suppliers support this approach.

From an economic perspective, however, it is above all gas consumers' willingness to pay that is decisive. Only if the blending of hydrogen reaches a scale that is significant in terms of emissions reduction (i.e., primarily at high blending ratios) and the use of blended hydrogen is recognised by regulators as an emission reduction measure, can hydrogen blending prove to be an economically viable strategy. In this regard, the timeframes for the relevant adjustments in the various regulatory areas are particularly crucial.

Finally, a broader economic issue arises from the relevant liability issues. Given the comparatively high degree of heterogeneity in technical requirements and usage limits, and the fact that, ultimately, it is the gas consumer with the low-est tolerance for admixture who is decisive in matters of liability (on the part of the grid operators), this may give rise to considerable risks for grid operators – risks that are incalculable without a full inventory of the user's installations – as well as the need for corresponding precautionary investments.

Beyond the overarching issues (regulatory framework, balancing approaches, etc.) the economic classification of hydrogen blending therefore always requires case-by-case assessments, the complexity of which also depends on the respective grid structures or the degree of grid interconnection, on consumer structures and seasonal factors, and thus has a very strong geographical or local component.

6. STRATEGIC ASPECTS

An assessment of hydrogen blending requires not only consideration of the various technical, regulatory and economic aspects, but also a broader strategic perspective.

Wherever possible and appropriate, the addition of hydrogen is generally a transitional measure. This applies less to the transmission networks, for which the development of dedicated hydrogen networks has been decided upon and is currently underway. Blending is therefore an option, if at all, for gas distribution networks. The injection of hydrogen into distribution networks can lead to time savings and short-term cost efficiencies as part of the hydrogen ramp-up and as a transitional option. However, this primarily concerns specific applications and, where appropriate, the establishment or safeguarding of local sector coupling strategies. Furthermore, the benefits depend heavily on the scale of hydrogen blending, in the sense of higher blending ratios.

However, these advantages – which are undeniable within the technical and regulatory framework – are offset by strategic disadvantages. Firstly, these relate to the potentially counterproductive incentives arising from blending strategies with regard to the development of dedicated hydrogen infrastructure (networks, storage facilities, terminals, etc.), which are indispensable in the medium and long term for the establishment of a hydrogen sector within the German and European energy (and industrial) systems. Secondly, the often underestimated effort involved in implementing blending strategies or dealing with risk and liability issues ties up private and public funds, which may then not be sufficiently available for the development of a hydrogen system, at least in the long term.

In order to enable significant levels of hydrogen blending, the legal and regulatory framework will need to be improved in the near future in many areas. In view of the areas of tension mentioned above and the timeframe for the ramp-up of hydrogen, any such changes would need to be designed not only to enable the blending of hydrogen, but also to allow for the phasing out of hydrogen blending in the future. This is likely to lead to a need for more complex regulatory frameworks, which are unlikely to be fully in line with the overarching strategic objective of simplification.

Against this background, political and strategic decisions are required as to whether the changes to the legal and regulatory framework necessary for hydrogen blending and to enhance its appeal (particularly at European or crossborder level) should be actively pursued and, given the transitional nature of hydrogen blending, can be implemented within a reasonable timeframe. The corresponding amendment of the (technical) regulations governing the permissibility of hydrogen blends at national level should, for the most part, be regarded as a ‘no-regret’ measure. The handling of liability issues for distribution system/grid operators and the resulting practical implications of potential hydrogen blending, in terms of costs and time required, is, in turn, a matter for political and strategic decisions at national level. Ultimately, when it comes to all decisions and strategies for action in the field of hydrogen blending, an important overarching criterion is the classification of hydrogen blending as a transitional strategy, as well as the avoidance of incentive effects that drive up costs or complexity in the medium and long term.

NATIONALER WASSERSTOFFRAT

THE GERMAN NATIONAL HYDROGEN COUNCIL

On 10 June 2020, the German Federal Government adopted the National Hydrogen Strategy and appointed the German National Hydrogen Council. The Council consists of 22 high-ranking experts in the fields of economy, science and civil society. These experts are not part of public administration. The members of the National Hydrogen Council are experts in the fields of production, research and innovation, industrial decarbonisation, transportation and buildings/heating, infrastructure, international partnerships as well as climate and sustainability. The National Hydrogen Council is temporarily chaired by Felix Chr. Matthes.

The task of the National Hydrogen Council is to advise and support the State Secretary's Committee for Hydrogen with proposals and recommendations for action in the implementation and further development of Germany's National Hydrogen Strategy.

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