15

Accelerating Permission

Hydrogen Transport and Storage Regulation – A German Case Study

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15.1 INTRODUCTION

German efforts to exploit the potential of hydrogen to accomplish the energy transition have in recent months seen significant acceleration. Following an update to the National Hydrogen Strategy (NWS) in July 2023,[1] the government recently doubled down on a decision to construct the basic and most important parts of the hydrogen network – the *core* network – which constitutes a crucial element of the wider infrastructure required to put hydrogen to use.

Legally, this is to be brought about via an amendment to the Energy Industry Act (EnWG) in article 28r EnWG-E.[2] Projects approved under this article are deemed to be necessary for the energy industry and in the overriding public interest provided they are commissioned by 2030. Further plans are underway to legally accelerate the permission procedure for projects related to core network construction.[3] The crucial issue of hydrogen storage is also acknowledged in both the recent amendment and the underlying strategy and is the subject of a separate concept currently being developed by the Federal Ministry for Economic Affairs and Climate Protection.[4]

More broadly, and beyond these new plans to swiftly bring about a new core network (the full mapping of which has yet to occur[5]), it is fair to say that a well-functioning planning and approval law is of paramount importance for the development of a hydrogen infrastructure.[6] Against this background, the following legal discussion focuses on those equally crucial parts of the hydrogen infrastructure that are not expected to be part of the new proposals and are subject to the existing planning and approval laws of energy plants.

[1] NWS <www.bmwk.de/Redaktion/EN/Publikationen/Energie/the-national-hydrogen-strategy.pdf?__blob=publicationFile&v=6> accessed 28 September 2023; NWS Update <www.bmbf.de/SharedDocs/Downloads/de/2023/230726-fortschreibung-nws.pdf?__blob=publicationFile&v=1> accessed 11 December 2023 (hereinafter: NWS Update).

[2] BR-Drs. 579/23 24; 'EnWG-E' clarifies the current draft status of the provision, which is expected to come into force by the end of 2023.

[3] Zeit Online, 'Energiewende' <www.zeit.de/wirtschaft/2023-11/wasserstoff-robert-habeck-netz-leitungen-energie> accessed 11 December 2023.

[4] NWS Update.

[5] FNB Gas, 'Wasserstoff-Kernnetz' <https://fnb-gas.de/en/hydrogen-core-network/> accessed 11 December 2023.

[6] M Kohls, 'Planung und Zulassung von Energieanlagen' in C Theobald, J Kühling (eds) *Energierecht* (C H Beck, 118th edn 2022) ch 130 para 2–2a (hereinafter: Kohls).

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Here, project developers face a significant number of sectoral regulations that are interconnected and can only be understood if their interdependencies are taken into account.[7] Importantly, Germany's law of energy plants is not self-contained or uniformly codified.[8] Depending on the classification, energy plants fall within the scope of application of the EnWG and/or another law and thus within the competence of the energy supervisory authority and/or other supervisory authorities.[9] Crucially, the EnWG includes provisions for expediting the development of hydrogen infrastructure, which can only be applied if the EnWG is applicable to the respective project. As will be shown below, this might not always be the case.

Moreover, Germany has two types of permission procedures – formal and simplified.[10] Public participation is required during the formal but not during the simplified procedure,[11] making the first more time-consuming.[12] To assess the relevant permit requirements, the competent authority must first be aware of the proposed energy installation.

To this end, the so-called administrative opening control requires the developer to inform the authority of the project and/or submit an application for permission before constructing and operating an energy plant.[13] With regard to the administrative opening control, a fundamental distinction must be made between the obligation to notify and the obligation to obtain a permit. The obligation to notify provides authorities with the necessary information, whereas permission obligations subject the construction and/or operation of an energy facility to a state permit.[14]

It is against this wider background of policy dynamism and domestic legal mechanisms that this chapter examines the matter of accelerated permission procedures for the construction of much-needed hydrogen infrastructure. Following this introduction, the chapter is structured into five further sections. Section 15.2 will examine the permission regime for the construction of new hydrogen pipelines. Section 15.3 then shifts the focus to the repurposing of existing natural gas pipelines for the transportation of hydrogen. Section 15.4 directs attention to another important hydrogen infrastructure component and delves into the permission regime for the construction of hydrogen storage. Section 15.5 does the same with a view to the repurposing of cavern storage from natural gas to hydrogen. Building upon these sections, a final conclusion and outlook will be presented in Section 15.6.

15.2 THE PERMISSION REGIME FOR THE CONSTRUCTION OF PURE HYDROGEN PIPELINES

This section will show that new construction projects in Germany are subject to stringent approval procedures, with little to no option for project developers to benefit from acceleration procedures. Further, it will illustrate that there is no single legal framework exclusively dedicated

[7] Ibid.

[8] M Lang, 'Einleitung und Grundlagen' in F Säcker, M Ludwigs (eds) *Berliner Kommentar zum Energierecht* (dfv Mediengruppe, 5th edn 2022) ch 3 para 1.

[9] C Theobald, 'EnWG § 3' in C Theobald, J Kühling (eds) *Energierecht* (C H Beck, 119th edn 2023) para 110.

[10] Kohls 18.

[11] Ibid 19.

[12] As part of the public participation process, anyone must be given the opportunity to raise objections to the project within a certain time frame. Participation can range from the publication of a project to the display of documents and the right to comment, possibly even to the organisation of a hearing. The aim is to ensure a fair procedure in which the individual is not merely the object of state decisions; see A Lippert, 'Die Bedeutung der Öffentlichkeitsbeteiligung bei großen Infrastrukturvorhaben' (2013) 24 ZUR 203, 204.

[13] Kohls 2–13.

[14] Ibid 3–5; C Schrader, 'BNatSchG § 17' in L Giesberts, M Reinhardt (eds) *BeckOK Umweltrecht* (C H Beck, 65th edn 2023) para 8.

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to energy plants, such as the construction of hydrogen pipelines and their associated facilities. Instead, the interconnectedness of numerous sector-specific provisions that may potentially apply will be looked into.

15.2.1 *Regional Planning*

When it comes to constructing new hydrogen pipelines, the requirements of regional planning processes must be taken into account. Key provisions include the allocation of energy plants and conflict resolution between such plants and other land uses.[15]

The regional planning procedure, as outlined in article 15 Regional Planning Act (ROG), can play an important role in the planning of energy facilities in the absence of comprehensive planning requirements.[16] Pursuant to article 1 No. 14 Regional Planning Ordinance (RoV), a regional planning procedure is required for gas pipelines of more than 300 mm diameter. As per article 43l (7) EnWG, the term 'gas pipelines' in article 1 No. 14 RoV explicitly includes hydrogen networks. It follows from the legislative documents that the wording 'with a diameter of more than 300 mm' is to be understood as the inside diameter as the nominal width.[17] This clarification is necessary because in engineering, diameters of pipelines are defined for the outer diameter.[18] This difference in understanding can lead to problems of application in practice.[19]

In this context, the literature raises the question whether, in the case of an interconnection of several hydrogen pipelines with different nominal diameters, one pipeline section with a diameter of more than 300 mm is sufficient for the fulfilment of the legal requirements, in this case article 1 No. 14 RoV in conjunction with article 43l (7) EnWG, or whether the predominant share of such pipelines in a network is decisive.[20]

While the wording seems to indicate that a single pipeline cannot fulfil the definition of a 'network', the legislator's explanatory memorandum (as well as the 'network' term in article 2 (2) of Directive 2009/73/EC) support the assumption that a single pipeline section is in fact sufficient to fulfil the definition of a 'network' and thus opens up the scope of section 1 No. 14 RoV.[21] The argument against this reading is that, given the legislator's intention to create a framework for the accelerated development and expansion of hydrogen networks, the implementation of regional planning procedures, which have so far not been necessary for gas supply networks, could also be avoided for hydrogen networks.[22] For the time being, there is a stronger case for assuming that a section of pipeline with a diameter of more than 300 mm is sufficient to meet the legal requirements and therefore the terms hydrogen pipeline and hydrogen network are to be understood synonymously.

[15] Kohls 191.
[16] Ibid 216.
[17] BT-Drs. 15/4068 8.
[18] A Bala, 'Das Erfordernis der Planfeststellung bei betrieblichen Baumaßnahmen an Gasversorgungsleitungen' (2016) 95 RdE 493.
[19] S Riege, 'Die Umstellung von Gasversorgungsleitungen für den Wasserstofftransport' (2021) 10 EnWZ 387, 389 (hereinafter: Riege).
[20] S Riege, M Schacht, 'EnWG § 43l' in L Assmann, M Pfeiffer (eds) *BeckOK EnWG* (C H Beck, 6th edn 2023) para 81 (hereinafter: Riege, Schacht).
[21] BT-Drs. 19/27453 118; M Pfeiffer, 'EnWG § 3 Nr. 39a' in L Assmann, M Peiffer (eds) *BeckOK EnWG* (C H Beck, 6th edn 2023) paras 6–7.
[22] Riege, Schacht 81.

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Accelerating regional planning procedures was the subject of a recent legislative resolution by the German Federal Parliament.[23] Long procedures are not only economically detrimental to project developers and investors but they also impede a swift energy transition.[24] The acceleration provisions include leveraging enhanced digitisation in participation procedures, reducing redundant amendments to draft plans, and refining plan maintenance rules to bolster planning and investment assurance.[25] Additionally, efforts aim to enhance cohesion between regional planning and approval processes, ultimately streamlining the overall procedure.[26]

Against the backdrop of the legislator's intention to quickly develop and expand Germany's hydrogen infrastructure amid sustained high expansion demand for the energy transition, expediting regional planning through the recent resolution holds potential for notable simplification and optimisation.

As mentioned above, the regional planning procedure has a broad geographical scope. For the more concrete approval of projects, the plan approval procedure is relevant, and will be discussed next.

15.2.2 *Plan Approval*

Large infrastructure projects often lead to conflicts of interest. To carefully weigh up all interests and take the best possible account of those affected, there is a plan approval procedure in Germany. It involves extensive participation by the authorities and, in most cases, the public.[27] Decisions on large-scale projects have to be made based on a single procedure to ensure that all relevant facts and interests are taken into account and an appropriate balance is struck.[28] The plan approval procedure is thus designed as a one-stop shop in that it includes all other official decisions required for the project's implementation.[29] This so-called concentration effect ensures that further public law permissions are not required for the energy facility, according to article 75 (1) 1 Administrative Procedures Act (VwVfG).[30]

Whether or not a plan approval procedure is required is determined by the relevant sectoral law.[31] The legal basis for the plan approval procedure can be found in articles 72–78 VwVfG.[32] For planning approval concerning the construction of hydrogen pipelines, article 43 and following EnWG contain special provisions. Explicit reference to articles 72–78 VwVfG is made in article 43 (4) EnWG, which shows the mentioned interdependence between the sectoral regulations and the general provisions in the law of energy plants.

Plan Approval Decision and Plan Authorisation

The planning approval authority can either be decided by means of a plan approval decision (article 74 (1) VwVfG) or a plan authorisation (article 74 (6) VwVfG). The plan authorisation

[23] BR-Drs. 95/23.
[24] H Schmitz, M Lehrian, 'Verfahrensbeschleunigung durch oder trotz Raumordnung – Das Raumordnungsverfahren im Kontext aktueller und geplanter Beschleunigungsgesetze' (2023) 46 ZfBR 221.
[25] BT-Drs. 20/4823 17.
[26] Ibid.
[27] Kohls 145.
[28] Ibid.
[29] M Wickel, 'VwVfG § 75' in R Strömer (ed) *Verwaltungsrecht Handkommentar* (Nomos, 5th edn 2021) para 19.
[30] Kohls 102.
[31] Ibid 145.
[32] The procedure can also be found in the procedural laws of the federal states which largely correspond to those of the federal government. Only more specific regulations of sectoral laws take precedence over the general regulations, e.g. art. 43 et seq. EnWG contain special regulations for the plan approval of energy line projects.

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substitutes the plan approval decision and thus, like the latter, enables the execution of the project described in the submitted plan.[33] The main difference between the two procedures is the exclusion of mandatory public participation from the plan authorisation procedure, leading to a faster process by comparison.[34] Due to the interplay with Annex 1 No. 19.2 Environmental Impact Assessment Act (UVPG) as per article 43l (2) EnWG, public participation may be mandatory if the construction of a hydrogen pipeline requires an environmental impact assessment (EIA). That is the case when length and diameter exceed certain values. If there is an obligation to carry out an EIA, public participation within the meaning of article 73 VwVfG is mandatory according to article 3 and 18 (1) UVPG. In this case, the option of an accelerated plan authorisation is ruled out because the requirements of article 74 (6) VwVfG are not met, and a planning approval decision is required. The same applies if a regional planning procedure is mandatory, since it too requires public participation and thus excludes the application of section 74 (6) VwVfG (see Section 15.2.1).[35] As the procedural provisions of the UVPG (which will be discussed below under Section 15.2.3) and ROG supplement the general procedural provisions of the VwVfG, the interplay of the different laws applicable becomes apparent.

Mandatory Plan Approval

The legal consequences of obtaining planning approval, as set out in article 43c EnWG in conjunction with article 75 VwVfG, encompass granting permission for the project, while taking into consideration all affected interests. As a result of the concentration effect of article 75 (1) 1 VwVfG, no additional official decisions are required.[36]

For hydrogen pipelines, a planning approval pursuant to article 43 EnWG might be applicable, provided they are 'gas supply pipelines' with a diameter exceeding 300 mm. According to article 43l (1) 1 EnWG, 'the term gas supply pipeline in part 5 of the law also includes hydrogen networks'. Moreover, article 43l (2) EnWG determines that the planning approval process applies to the construction, operation, and modification of hydrogen pipelines with a diameter exceeding 300 mm.[37] Thus, all provisions of the EnWG on plan approval apply to hydrogen networks with a diameter exceeding 300 mm.

In accordance with article 43 (3) EnWG, the consideration of plan approval for a project necessitates the inclusion of both public and private interests that are affected by the project.[38] The weighing of interests is a decision-making instrument in German administrative law. It involves the special circumstance that a permit can be granted or an intervention legitimised even though the interests or rights of others are affected. Here, the weighing process must take into account municipal, as well as environmental concerns in relation to the public law permission for an energy pipeline project.[39] It is important to note that article 43l (1) 2 EnWG features a so-called overriding public interest for the construction of hydrogen

[33] H-J Peters et al, 'UVPG § 65' in H-J Peters, S Balla, T Hesselbarth (eds) *Gesetz über die Umweltverträglichkeitsprüfung* (Nomos, 4th edn 2019) para 11 (hereinafter: Peters et al).

[34] N Kämper 'VwVfG § 74' in J Bader, M Ronellenfitsch (eds) *BeckOK VwVfG* (C H Beck, 59th edn 2023) para 131; W Huck, 'VwVfG § 74' in M Müller, W Huck (eds) *Beck'sche Kompakt Kommentare Verwaltungsverfahrensgesetz* (C H Beck, 3rd edn 2020) paras 66–67.

[35] It's unlikely that the acceleration provision of § 74 (7) 1 VwVfG will apply to hydrogen pipeline construction due to their significant importance in infrastructure projects.

[36] Riege, Schacht 21.

[37] S Riege, 'EnWG § 43' in L Assmann, M Pfeiffer (eds) *BeckOK EnWG* (C H Beck, 6th edn 2023) para 57.5–60.

[38] S Missling et al, 'EnWG § 43' in C Theobald, J Kühling (eds) *Energierecht* (C H Beck, 118th edn 2022) para 98.

[39] Ibid 103–104.

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pipelines. This overriding public interest privilege is limited until 31 December 2025. Therefore, in situations where protected interests need to be balanced, priority should be given to hydrogen pipelines, at least until the end of 2025.[40] In view of the typical length of the planning approval procedure and (if necessary) a preceding regional planning procedure,[41] however, the duration of the overriding public interest privilege seems to be too short and the legislator should reconsider extending the privilege beyond 2025.

Facultative Plan Approval or Mandatory Plan Authorisation

Project developers have the option to voluntarily submit an application for planning approval under article 43l (3) 1 EnWG, when a planning approval procedure is not mandatory because the pipeline's diameter does not exceed 300 mm as stipulated by article 43l (2) and 43 EnWG in conjunction with article 43l (1) 1 EnWG.

One argument in favour of seeking planning approval is the concentration effect, which eliminates the need to apply for individual approvals from numerous authorities.[42] Another is the early transfer of ownership as specified in article 44b EnWG and the possibility of commencing construction early under article 44c EnWG. Conversely, as long as the provision of article 43l (1) 2 EnWG on the overriding public interest for the construction of hydrogen pipelines is in force, it may be possible to secure the necessary individual permits more easily compared to undergoing a time-consuming planning approval procedure.

Additionally, the regulation of article 65 (2) UVPG must be taken into account, according to which the project requires planning authorisation if no EIA is required. For the construction of hydrogen pipelines with a diameter of less than 300 mm, for which there is no obligatory plan approval procedure and for which the general preliminary examination or site-specific examination of the individual case indicates that no EIA is necessary, project developers have the choice of whether they want to carry out a facultative plan approval under the EnWG or a plan authorisation under the UVPG.

In the case of a facultative plan approval under the EnWG, the advantage over plan authorisation under the UVPG would be that the specific acceleration regulations under energy law would apply.[43] However, the legal privilege under article 43l (1) 2 EnWG only applies until 31 December 2025. In contrast, plan authorisation offers advantages over plan approval in that it has the same legal effect without having to comply with the time-consuming requirements associated with the plan approval process, such as the public participation procedure under article 73 VwVfG.[44] To conclude, developers must promptly establish the appropriate and optimal procedure for their project to capitalise on the benefits of the procedure that best suits their respective project plans.

Finally, if a plan approval procedure is carried out, environmental concerns are included in the concentration effect; if not, such concerns must be addressed separately. The following section therefore examines what in all cases is part and parcel of the permission procedure.

[40] F Allolio et al, 'Studie zum Rechtsrahmen einer zukünftigen Wasserstoffwirtschaft' (2022) legal study commissioned by the Fraunhofer Institute for Energy Infrastructures and Geothermal Energy, 39 (hereinafter: Allolio).

[41] The process can take several years. This depends in particular on the intensity of public participation, the possible preparation of expert opinions by citizens' initiatives, the processing of objections and comments by the authorities and, if necessary, further coordination and plan amendments.

[42] Allolio 36.

[43] M Elspas et al, 'Die neuen Regelungen im EnWG zum Wasserstoff' (2021) N&R 258, 264 (hereinafter: Elspas).

[44] Peters et al 11; Elspas 264.

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15.2.3 *Environmental Law*

Various attempts to unify German environmental law have so far failed, which means German environmental law is splintered and consists of various sectoral laws.[45] As a result, the many sectoral environmental laws that focus on specific environmental areas – such as the UVPG, as well as nature conservation law, water resources law, or forest law – must be taken into account individually when constructing hydrogen pipelines.

The Federal Immission Control Act (BImSchG) is another law which aims to protect various aspects of the environment.[46] The BImSchG is limited to general requirements. It is only through sub-legislative concretisation in numerous implementing ordinances that these become manageable for legal application. One of those is the 4th Ordinance on the Implementation of the BImSchG (4. BImSchV), which plays a constitutive role in determining the types of installations subject to permission. As the transportation of hydrogen is not listed in its Annex 1, an emission control permit is not required here.

Interestingly, hydrogen-specific provisions can only be found for the EIA. However, the legal privilege outlined in article 43l (1) EnWG, which establishes the overriding public interest privilege until 31 December 2025 for the construction of hydrogen pipelines, may play a decisive role in balancing processes with individual environmental laws.

The construction and operation of a gas supply pipeline require an EIA if length and diameter exceed certain values, according to No. 19.2 of Annex 1 to the UVPG. Article 43l (2) 1 EnWG stipulates that Annex 1 No. 19.2 UVPG is applicable to hydrogen networks. The EIA obligation varies depending on whether it is mandatory (projects in column 1 of Annex 1) or determined through an official preliminary assessment (projects in column 2 of Annex 1).[47] For hydrogen grids with a length over 40 km and a diameter over 800 mm, the EIA is mandatory according to Annex 1 No. 19.2.1 of the UVPG in conjunction with article 43l (2) 2 EnWG. In the case of hydrogen networks with pipelines having a diameter between 300 mm and 800 mm, new projects require a preliminary assessment under article 7 UVPG.[48]

The purpose of the preliminary assessment is to check, in a relatively quick and inexpensive way, whether or not an EIA is required for projects that could have an abstract or concrete significant environmental impact.[49] A distinction is made between two types of preliminary assessment: a general preliminary assessment (article 7 (1) 1 UVPG) and a site-specific preliminary assessment (article 7 (2) UVPG). The latter corresponds to a large extent to the former, but with the possibility of a reduced assessment programme.[50] The preliminary assessment will be particularly helpful for projects where large parts of the natural gas pipelines can be repurposed for hydrogen and only a few new pipelines with diameters between 300 mm and 800 mm need to be built to complement the network.

However, it must be acknowledged that the EIA authorisation process, in general, is quite time-consuming. Between 2009 and 2021 the average time from application to decision was

[45] Umweltbundesamt, 'Umweltgesetzbuch' <www.umweltbundesamt.de/umweltgesetzbuch#grunde-fur-ein-umweltgesetzbuch> accessed 6 December 2023.

[46] Act on the Prevention of Harmful Effects on the Environment Caused by Air Pollution, Noise, Vibration and Similar Phenomena (Federal Immission Control Act – BImSchG) <www.bmuv.de/fileadmin/Daten_BMU/Download_PDF/Luft/bimschg_en_bf.pdf> accessed 30 June 2024.

[47] Kohls 36a.

[48] Further details can be found in Nos. 19.2.2 to 19.2.4 of Annex 1 to the UVPG.

[49] J Tepperwien, 'UVPG § 7' in A Schink, O Reidt, S Mitschang (eds) *Umweltverträglichkeitsprüfungsgesetz Umwelt-Rechtsbehelfsgesetz* (C H Beck, 2nd edn 2023) para 1.

[50] Ibid 15; the programme is set out in article 7 (2) UVPG.

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16.8 months.[51] This clearly poses a challenge for the intended rapid development of a hydrogen infrastructure in Germany and will need to be addressed further by policy-makers going forward, in the interest of accelerating the permission procedure. One area where such acceleration has arguably occurred is pipeline rights and land use agreements, to which the following section is devoted.

15.2.4 *Pipeline Rights and Land Use Agreements*

Pipeline-based energy supply often requires the use of land that is owned by third parties.[52] While public law permissions primarily address public law concerns, they do not account for potential conflicts with the private rights of third parties, such as land ownership. As a result, construction and operation[53] of gas supply pipelines require civil law approval in addition to public law permits.

For pipeline rights to properties that are not dedicated as public transport routes, such as licence agreements, limited personal easements or other agreements that do not provide for the registration of a limited personal easement, article 113a (1) EnWG determines that existing approvals for gas supply pipelines are, when in doubt, to be interpreted in a manner that includes the construction and operation of hydrogen pipelines. However, if it can be concluded from the agreement that the third party did not wish to authorise hydrogen pipelines on its property, or would not have had it been asked to do so, there is no doubt about interpretation, and therefore no applicability of article 113a (1) EnWG.

Pipeline rights on public transport routes, so-called land use agreements within the meaning of article 46 EnWG, are regulated in article 113a (2) and (3) EnWG. If a network operator has a land use agreement as defined by article 46 EnWG for gas pipelines, this contract also applies to the transport and distribution of hydrogen, but only until the end of its term, according to article 113a (2) EnWG.[54] However, article 113a (3) EnWG establishes the right of hydrogen network operators to request land use agreements from municipalities if the current contract period has come to an end. In effect, this imposes a contracting obligation on the latter, alleviating the burden of contract negotiations for new projects.[55] Moreover, article 113a (3) EnWG stipulates that the conditions of land use agreements for hydrogen pipelines may not be less favourable than those of land use agreements for gas pipelines.[56]

Only when new contracts are concluded do developers need to take action; it is only new contracts with private parties that are not subject to special regulations. Overall, article 113a EnWG enables the gradual expansion and development of hydrogen networks without delays caused by legal uncertainties in contract interpretation or required contract negotiations.[57]

[51] Federal Environment Agency, 'Genehmigungsverfahren 2009–2021' (2023) <https://umweltbundesamt.at/uvpsup/?verfahrensmonitoring?/vm-dauer/gv-dauer> accessed 28 September 2023.

[52] A Bartsch, E Ahnis, 'Leitungsrechte in der Energiewirtschaft: Die beschränkte persönliche Dienstbarkeit' (2014) 11 IR 122; Riege 394.

[53] Civil law approvals to operate pipelines often arise from limited personal easements, art. 1090 et seq. German Civil Code [BGB]. Currently, limited personal easements are registered in the cadastre for the construction and operation of 'gas, long-distance gas or natural gas pipelines'; see BR-Drs. 165/21 160; BT-Drs. 19/27453 137.

[54] Elspas 266.

[55] Allolio 44.

[56] BT-Drs. 19/27453 138; Elspas 266.

[57] BR-Drs. 165/21 160; T Börker et al, 'Auswirkungen der EnWG-Novelle 2021 auf wegerechtliche Gestattungen für Wasserstoffnetze' (2021) 18 IR 197, 199.

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Having assessed the permission regime for the *construction* of hydrogen pipelines, we will now turn to the issue of *repurposing* existing natural gas pipelines for the transportation of this promising carrier of energy.

15.3 THE PERMISSION REGIME FOR REPURPOSING PIPELINES

As the new EnWG amendment and the revised NWS emphasise,[58] Germany is banking heavily on the repurposing of natural gas pipelines for hydrogen. Given the decline in fossil fuels required to achieve climate targets, it is logical to use the existing natural gas infrastructure for hydrogen transport. As this section will demonstrate, from a permission point of view, this approach is already flanked by energy legislation that existed prior to the recent EnWG amendment.

15.3.1 *Plan Approval Procedure*

The most important planning law regulation for accelerating the establishment and expansion of hydrogen networks is the regulation governing procedural simplifications for the repurposing of existing gas supply pipelines to hydrogen, which is outlined in article 43l (4) EnWG.[59] Article 43l (4) and (5) EnWG provide a special lever. They extend the scope of official approvals for natural gas pipelines and their ancillary facilities to hydrogen transportation. This is subject to the requirement that the initial natural gas pipeline approvals were integrated in a plan approval procedure and do not require an emission control permit[60] (see Section 15.2.3), and had been based on the EnWG or another law.[61] According to article 43l (4) 2 EnWG, the transferability applies not only to previous official approvals, but also to pipelines that were subject only to a notification procedure. Accordingly, these gas supply systems are allowed to be repurposed for hydrogen without a plan approval procedure.[62]

According to article 43l (4) 3 EnWG in conjunction with article 113c (3) EnWG, there is a mandatory notification requirement for repurposing. The notification, along with necessary safety assessment documents and an expert report verifying compliance with the technical rules of the German Technical and Scientific Association for Gas and Water (DVGW),[63] must be submitted to the competent authority at least eight weeks before the repurposing begins.[64] The authority then has an eight-week window to confirm that there are no objections to the repurposing (article 43l (4) 3 EnWG in conjunction with article 49 (1) EnWG).

Article 113c (3) EnWG does not differentiate between gas pipelines of different pressure levels or different lengths and diameters, extending the official preventive control to all gas pipelines that are to be repurposed. Scholars have questioned the proportionality of this

[58] Article 28r (2) EnWG-E; NWS Update 14; FNB Gas <www.bundesnetzagentur.de/DE/Fachthemen/ElektrizitaetundGas/Wasserstoff/Kernnetz/Downloads/Antragsentwurf_FNB.pdf?__blob=publicationFile&v=3> accessed 11 December 2023.

[59] Elspas 264.

[60] The transportation of natural gas via pipelines is not listed in the 4. BImSchV.

[61] Allolio 31.

[62] Building law permissions and nature conservation permissions also extend to the transport of hydrogen under § 43l (4) and (5) EnWG.

[63] The main task of the Association is to draw up the technical regulations that ensure the safety and reliability of gas and water supply in Germany. Legislation grants the DVGW worksheets the status of generally recognised technical rules. The users can therefore assume with legal certainty that compliance with the rules equates to compliance with public law regulations.

[64] Allolio 32.

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extension of regulatory control, arguing that it restricts the technical self-administration of the gas industry enshrined in article 49 EnWG and brings about additional bureaucracy.[65] This can be countered by the fact that article 49 EnWG actually provides for the operator's own responsibility to comply with the technical rules, so that the authority only takes action in exceptional cases, namely when the operator clearly fails to meet its responsibilities.[66] The obligation to notify and the requirement to obtain an expert's opinion during the repurposing process therefore serve to ensure safety during the transitional phase.[67]

Until recently it was assumed that technical modifications would be necessary when repurposing natural gas pipelines for the use of hydrogen.[68] However, a current research project by the DVGW, which investigated the fracture-mechanical material behaviour of natural gas steel pipelines, demonstrated their suitability for hydrogen transmission.[69] Should modifications nevertheless become necessary, these may fall under the requirements of either article 43l (2) EnWG or article 43f EnWG.

According to article 43l (2) EnWG, the modification of hydrogen pipelines with a diameter of more than 300 mm requires planning approval. The modification of pipelines with a diameter of 300 mm or less is subject to a facultative plan approval procedure (as discussed earlier in this chapter). That said, article 43l (4) EnWG determines that for modifications and extensions of natural gas pipelines for the transport of hydrogen, article 43f EnWG remains unaffected, according to which a notification procedure can replace the planning approval procedure in cases of insignificant modifications or extensions.

The determining factor for article 43f (1) EnWG to be triggered is that a 'modification' is made and that this modification is considered to be 'insignificant'. There is no legal definition of the term 'modification'.[70] Whether a 'modification' occurred must be based on the previous approval decision and interpreted on the basis of the approved version of the plant, including all ancillary provisions, application documents and procedures.[71] In the literature, Riege concludes that the more detailed the authorisation documents are, the more likely repurposing measures will be considered a significant deviation, while the more general the description of the installation is, the more likely a notification procedure will be approved.[72] Further, article 43f (1) EnWG allows for the assumption of 'insignificance of a modification or extension' if (i) an EIA is not required, (ii) other public interests are not affected, and (iii) the rights of third parties are not affected or appropriate agreements are concluded. To this end, article 43f (2) No. 1 in conjunction with article 43l (4) EnWG stipulates that for 'modifications and extensions' to repurpose natural gas pipelines for hydrogen, an EIA is not necessary (if the requirements of article 43f (2) EnWG are met).[73] Pursuant to article 43f (4) 5 in conjunction with article 43f (2) 1 No. 1 EnWG, no examination of the rights in property of others is required for the modifications and extensions of gas supply pipelines in question. The permitting for repurposing

[65] M Pfeiffer, '§ 113c EnWG' in L Assmann, M Peiffer (eds) BeckOK EnWG (C H Beck, 6th edn 2023) para 7.
[66] BT-Drs. 19/27453 83.
[67] S Grüner, 'EnWG § 113c' in K Bourwieg, J Hellermann, G Hermes (eds) *Energiewirtschaftsgesetz Kommentar* (C H Beck, 4th edn 2023) para 2.
[68] Allolio 32; Riege 391.
[69] DVGW, 'Project SyWeSt H2' <www.dvgw.de/medien/dvgw/forschung/berichte/g202006-sywesth2-steel-dvgw.pdf> accessed 11 December 2023.
[70] BT-Drs. 19/27453 132.
[71] Ibid; Riege, Schacht para 25; Riege 391; Allolio 32.
[72] Riege 391.
[73] For details see G Hermeier, J Hilsmann, 'EnWG § 43f' in L Assmann, M Pfeiffer (eds) *BeckOK EnWG* (C H Beck, 6th edn 2023) para 29.

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pipelines with a diameter exceeding 300 mm can thus be streamlined and simplified by usage of the notification process.[74]

It must be noted, though, that the notification procedure can only replace the planning approval procedure if it would be necessary without the requirements of article 43f EnWG. That means cases of facultative planning approval are excluded from the scope of applications.[75] This result affects modifications made to pipelines with a diameter of 300 mm or less, according to article 43l (2) EnWG. Developers of pipelines with these diameters must therefore obtain the necessary permissions individually unless they opt for a facultative plan approval procedure. This leads to the, rather peculiar, result that the modification of the larger diameter pipelines, which might have more impact than the smaller ones, can be approved through a simple notification procedure, while the smaller ones have to obtain individual approvals for the modification.

Although article 43f (4) 4 EnWG provides for an official decision deadline of one month, in practice this deadline will often not be met due to lack of personnel.[76] In this situation, there is no fictitious approval that would allow the developer to start the repurposing project after a certain period of time.[77] In fact, the resources of the authorities determine the decision deadline. In the event that the deadline is exceeded, developers may only file an action for failure to act pursuant to article 75 Administrative Court Procedures Code (VwGO).[78] However, from a technical point of view, the essential parameters of an existing gas supply pipeline, such as its route, outside diameter, or length, remain unchanged in case of repurposing.[79] Against this backdrop, the obligation for planning approval for the modification of pipelines seems unreasonable, as does the lack of a fictitious approval in the case of insignificant modifications to pipelines.

Before moving on to the matter of land use agreements, an important aspect of the aforementioned environmental law pertaining to the repurposing of pipelines (as opposed to their construction, see Section 15.2.3) merits a brief discussion.

15.3.2 *Environmental Impact Assessment*

The use of an EIA when repurposing pipelines differs from the case of the construction of a pipeline. As the EIA is always conducted as an integral part of an official approval procedure, according to article 4 UVPG, it requires a so-called carrier procedure, and thus a procedure in which it is embedded.[80] However, if the procedural simplification of article 43l (4), (5) EnWG applies, as is the case with repurposing of gas pipelines, such a carrier procedure is lacking.[81] Consequently, article 43f (2) No. 1 EnWG specifies that an EIA is not necessary for the modification or expansion of gas supply pipelines for hydrogen transport under article 43l (4) EnWG. This allows for quick repurposing while still requiring a notification and thus allowing the competent authority an intervention to prohibit the repurposing due to safety concerns.[82]

[74] Elspas 265; Allolio 33.
[75] Riege 389.
[76] Allolio 33; Riege 393.
[77] J-C Pielow, 'EnWG § 43f' in F Säcker (ed) *Berliner Kommentar zum Energierecht* (dfv Mediengruppe, 4th edn 2019) para 15; Allolio 33; Riege 393.
[78] Ibid 15.
[79] BT-Drs. 19/27453 132.
[80] H Hentschke, '§ 17 Zulassung von Anlagen' in M Dombert, K Witt (eds) *Münchener Anwalts Handbuch Agrarrecht* (C H Beck, 3rd edn 2022) para 21.
[81] BT-Drs. 19/28407 3; Riege, Schacht 41.
[82] D Benrath, 'Reine Wasserstoffnetze: Macht der Gesetzgeber seine Hausaufgaben?' (2021) 10 EnWZ 195, 198 (hereinafter: Benrath); Hermeier 16.

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In the literature, Benrath raises concerns about the exclusion of an EIA in cases of repurposing.[83] He argues that if the pipeline is used for hydrogen instead of natural gas, this could alter the risk profile for the pipeline operation, and the environmental impacts of potential incidents should be taken into account alongside the normal operational burdens.[84] A blanket exemption from the EIA would be contrary to the existing system.[85] This argument can be refuted when there is no additional adverse environmental effect resulting solely from the change of medium in the pipeline.[86] As long as the essential parameters such as the route and the diameter of the pipeline do not change, it is reasonable to exempt the repurposing of a gas network to hydrogen from the EIA obligation.

While an EIA is a critical tool for identifying and evaluating environmental impacts and ensuring compliance with environmental regulations, it must be noted that the preceding approval procedure for the natural gas pipeline will already have featured an EIA. Therefore, in the case of mere repurposing where modifications, if necessary, are made solely on the inside of the pipelines or the pressure they are operated with is altered, the omission of a second EIA seems justified. Moreover, in light of the time-intensive nature of such a procedure, the omission of an EIA will significantly support the intended rapid expansion of a hydrogen infrastructure in Germany.

15.3.3 *Land Use Agreements*

When repurposing natural gas pipelines for the transport of hydrogen, project developers will regularly be confronted with the fact that the existing civil law contracts with landowners for the construction and operation of the pipelines do not refer to hydrogen.[87] Therefore, in the event of disagreement with the landowner over the inclusion of the repurposed pipeline in the scope of the agreement, the relevant agreement will have to be interpreted.[88] As demonstrated above, article 113a (1) EnWG contains an interpretation rule in favour of the developer (see Section 15.2.4).

Pipeline rights on public transport routes, so-called land use agreements within the meaning of article 46 EnWG, are regulated by article 113a (2) and (3) EnWG. These agreements will continue to be valid for the transport and distribution of hydrogen until their agreed term expires (see Section 15.2.4). It has to be said that repurposed pipelines may no longer meet the requirements of article 46 EnWG, which pertains to the concession award for energy supply networks in municipal areas.[89] During the initial phase of the hydrogen ramp-up, these conditions may no longer be met, particularly for hydrogen networks initially serving only individual industrial enterprises and extending beyond municipal boundaries.[90] To this end, article 113a (2) ensures ongoing revenues for municipalities even if the pipelines no longer serve end consumers within municipal areas, while enabling network operators to utilise the repur-

[83] Benrath 198.
[84] Ibid.
[85] Ibid.
[86] BT-Drs. 19/27453 132.
[87] Elspas 266.
[88] Ibid.
[89] M Pfeiffer, 'EnWG § 46' in L Assmann, M Pfeiffer (eds), *BeckOK EnWG* (C H Beck, 6th edn 2023) para 47; C Theobald, J Schneider, 'EnWG § 46' in C Theobald, J Kühling (eds) *Energierecht* (C H Beck, 118th edn 2022) para 28.
[90] BT-Drs. 19/28407 28.

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posed pipelines without encountering significant bureaucratic obstacles.[91] It is only at the end of the agreed term that the parties will need to enter into a new agreement, which must offer terms no less favourable than those of the previously existing contracts (article 113a (3) EnWG), as discussed above in Section 15.2.4.

Following the analysis of the legal regime for repurposing pipelines, we now turn to the subsequent challenge of hydrogen storage.

15.4 THE PERMISSION REGIME FOR HYDROGEN STORAGE CONSTRUCTION

Storage is a key part of the required hydrogen infrastructure. Due to natural fluctuations in renewable energy production from sources like wind and solar, efficient storage options are crucial to balance out these fluctuations and meet demand.[92] Hydrogen can be stored above ground or underground. Both options are subject to different permission requirements. Cavern storage and pore storage are the two primary underground storage options (above-ground storage for considerable amounts of hydrogen is restricted due to technical limitations and high costs).[93] Higher injection and withdrawal rates render cavern storage more efficient than pore storage.[94] While the former can be fully repurposed to hydrogen, use of the latter requires further research.[95] Therefore, here the focus will be directed at the legal regime for salt cavern storage.

It is important to acknowledge that large-scale underground storage of hydrogen has not yet been pursued in Germany, and there exists no definitive legal framework.[96] Presently, only pilot projects are underway, indicating an early stage of development.[97]

As established in the Introduction, the EnWG includes provisions for expediting the development of hydrogen infrastructure, which can only be applied if the EnWG is applicable to the respective project. The EnWG, however, is not applicable underground and does not cover the construction of salt caverns used for storing hydrogen. Instead, German mining law is applicable. As will be shown, mining law does not yet provide for any special regulation concerning hydrogen. The following sections consider the *construction* of salt caverns for hydrogen storage, before then turning to the *repurposing* of existing natural gas salt caverns for hydrogen purposes.

Salt cavern storage facilities for hydrogen are 'underground storage' facilities within the meaning of mining law. Article 4 (9) Federal Mining Act (BBergG), defines 'underground storage' as a facility that is employed for the subterranean storage of gases, liquids, and solid substances, excluding water. The utilisation of containerless storage techniques is mandatory to

[91] Ibid.

[92] P Adam et al, 'Wasserstoffinfrastruktur – tragende Säule der Energiewende. Umstellung von Ferngasnetzen auf Wasserstoffbetrieb in der Praxis' (2020) Whitepaper 19.

[93] BT-Drs. 8/1315 76; M Warnecke, S Röhling, 'Untertägige Speicherung von Wasserstoff – Status quo' (2021) Z Dt Ges Geowiss 1 <www.deutsche-rohstoffagentur.de/DE/Themen/Nutzung_tieferer_Untergrund_CO2Speicherung/Downloads/2021_Speicherung_Wasserstoff.pdf?__blob=publicationFile&v=2> accessed 10 December 2023 (hereinafter: Warnecke, Röhling); The limitation in above-ground storage arises from the low-pressure conditions that impose constraints on hydrogen storage densities, resulting in the requirement for substantial storage volumes and substantial investment costs. Consequently, this option becomes unattractive from a cost–benefit perspective.

[94] Warnecke, Röhling; Nationaler Wasserstoffrat, 'Die Rolle der Untergrund-Gasspeicher zur Entwicklung eines Wasserstoffmarktes in Deutschland' (2021) <www.wasserstoffrat.de/fileadmin/wasserstoffrat/media/Dokumente/2022/2021-10-29_NWR-Grundlagenpapier_Wasserstoffspeicher.pdf> accessed 4 June 2023 (hereinafter: Nationaler Wasserstoffrat).

[95] Ibid.

[96] Project H2-UGS, 'Leitfaden Planung, Genehmigung und Betrieb von Wasserstoff-Kavernenspeichern' (2022) 527 (hereinafter: Project H2-UGS).

[97] INES, 'Positionspapier' <https://energien-speichern.de/wp-content/uploads/2023/10/20231006_INES-Positionspapier_Vorschlaege-Marktrahmen_Entwicklung-H2-Speicher.pdf> accessed 6 December 2023.

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bring underground hydrogen storage facilities within the scope of the BBergG.[98] This is the lever for the inclusion of cavern storage facilities for gaseous hydrogen in the scope of the Act.[99]

Article 126 (1) BBergG lists specific regulations that are applicable to underground storage. According to article 51 (1) in conjunction with article 126 (1) 1 BBergG, the permitting of construction and management of underground storage facilities is only possible on the basis of operating plan procedures.[100] The various types of operating plans are regulated by article 52 BBergG. The type of operating plan procedure largely determines the scope and duration of the approval process, with projects not subject to EIA being approved significantly faster than those having to go through public participation.[101]

Pursuant to article 126 (1) BBergG in conjunction with article 51 and following BBergG, underground storage facilities require a *main operating plan* under mining law. The main operating plan is an essential and constitutive part of the permit for the commencement of mining operations and cannot be replaced by other plans under mining law.[102] It forms the operational and technical basis for the construction and management of the operation.

In addition, the preparation of a *framework operating plan* is required under article 52 (2a) BBergG in conjunction with article 126 (1) BBergG, and a plan approval procedure is needed for its approval if a project requires an EIA pursuant to the ordinance under article 57c BBergG in conjunction with article 4 and following UVPG. The relevant ordinance is the Environmental Impact Assessment Ordinance Mining (UVP-V-Bergbau). Article 1 UVP-V-Bergbau lists the operations which require an EIA. Hydrogen is currently not listed there. However, this is seen as a regulatory gap that is to be closed by a current draft of an amendment to the ordinance.[103] According to the draft, the same requirements will apply to the storage of hydrogen as in the case of storage of natural gas. The current lack of legal certainty as to when an EIA is necessary for underground hydrogen storage facilities will thus be eliminated. Therefore, the construction of underground salt cavern storage for hydrogen will be subject to an EIA under mining law and therefore require planning approval. In conclusion, a main operating plan and additionally a framework operating plan will have to be drawn up.

The current draft amendment to the UVP-V-Bergbau underlines the early stage of a framework for underground hydrogen storage. Hydrogen-specific regulations that would support accelerated permission procedures for underground storage, as they exist for pipelines, are not provided for by current mining law. Having said that, the German government is currently working on a hydrogen storage strategy that is supposed to be finalised by 2024.[104]

Following this discussion of the permitting regime for pure and newly built hydrogen storage, we will now turn to the question of repurposing existing natural gas storage.

[98] H Weller, U Kullmann, 'BBergG § 126' in U Kullmann (ed) *NomosKommentar Bundesberggesetz* (Nomos, 1st edn 2012) para 2; Allolio 48.

[99] BT-Drs. 8/1315 76; M-L Weiss, 'Das Bergrecht und seine energiewirtschaftlichen Bezüge' in C Theobald, J Kühling (eds) *Energierecht* (C H Beck, 118th edn 2022) ch 137 para 177 (hereinafter: Weiss).

[100] Weiss 181.

[101] Project H2-UGS 526.

[102] Weiss 64.

[103] BR-Drs. 561/23.

[104] BMWK, 'Anfrage' <www.bmwk.de/Redaktion/DE/Parlamentarische-Anfragen/2023/09/9-449.pdf?__blob=publicationFile&v=4> accessed 11 December 2023.

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15.5 THE PERMISSION REGIME FOR REPURPOSING EXISTING SALT CAVERN STORAGE FROM NATURAL GAS TO HYDROGEN

From a technical point of view, it is possible to fully repurpose salt cavern storage from natural gas to hydrogen.[105] Legally, the repurposing of underground natural gas storage facilities will require an amendment to the operating plan, article 52 (4) 2 BBergG.[106] The amendment, like the original operating plan, requires official approval.[107] As mentioned above, hydrogen-specific acceleration provisions do not currently exist but are being developed.

Although the official approval granted for the cavern storage for natural gas could potentially be transferred to the storage of hydrogen through a notification procedure,[108] the current legal framework does not provide for such an approval to be transferred. The underlying assumptions, namely that (1) all necessary approvals have already been granted for the previous use for natural gas; (2) the relevant procedures conducted; and (3) the risk profile does not change in line with the medium in the storage facility or pipeline, are similar to the discussions earlier in this chapter. To sum up: a provision on the repurposing of natural gas storage in the BBergG would greatly benefit the intended accelerated expansion of the hydrogen infrastructure.

15.6 CONCLUSION AND OUTLOOK: FROM INTENTIONS TO IMPLEMENTATION

The imperative to swiftly develop Germany's hydrogen infrastructure is evident and German policy-makers' legislative intentions are clear. With the pressing need for an energy transition and the legislators' explicit goal of establishing an accelerated framework for hydrogen infrastructure development, the government's recent decision to construct a hydrogen *core* network, accompanied by an acceleration law, sets the right course. This core network will be the first step in establishing the full-blown infrastructure that hydrogen use requires.

The aim of the second step of hydrogen infrastructure planning is a nationwide, meshed hydrogen network. Among the existing regulatory provisions for the construction of new pipelines, article 113a EnWG concerning easement agreements offers a pathway for project developers to circumvent the laborious and costly contract negotiation process under specified conditions. This provision stands out as an exception by providing vital support for the rapid scaling up of a hydrogen infrastructure.

The broader regulatory landscape, notably article 43l (1) 2 EnWG, which asserts the paramount public interest in hydrogen projects during the balancing process, falls short. Its application ceases as early as 31 December 2025, implying potential invalidity when regional planning or plan approval procedures, which are inherently time-intensive, are required. This limitation, coupled with the recognised protracted nature of the EIA process, presents a palpable impediment to the prompt development of the hydrogen infrastructure envisioned in Germany. Relief will be brought about for projects that will be part of the core network. Article 28r EnWG-E stipulates that these projects are considered to be in the overriding public interest provided they are commissioned by 2030.

Considering this, article 43l (4), (5) EnWG emerges as a pivotal regulation significantly facilitating the establishment and expansion of hydrogen networks. It governs procedural

[105] Nationaler Wasserstoffrat.
[106] Allolio 50.
[107] H Weller, U Kullmann, 'BBergG § 52' in U Kullmann (ed) *NomosKommentar Bundesberggesetz* (Nomos, 1st edn 2012) para 6.
[108] As is the case for repurposing of pipelines under article 43l (4), (5) EnWG.

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simplifications specifically for the repurposing of existing natural gas supply pipelines for hydrogen. By contrast, the construction of new pipelines necessitates the navigation of a complex web of permissions under diverse laws, underscoring the streamlined notification procedure for repurposing projects as an advantageous alternative.

Turning to hydrogen storage, an astonishing absence of hydrogen-specific regulation for underground cavern storage must be observed, even though such facilities play a critical role in maintaining grid stability and providing essential system services. However, things are changing. While storage systems were a minor consideration in NWS 2020, they feature more prominently in the updated NWS. Further, the amendment to the UVP-V-Bergbau is under way. It provides a degree of clarity regarding the matter of underground hydrogen storage. Moreover, the government is currently working on its first hydrogen storage strategy.

Considering the pressing need for establishing a hydrogen infrastructure to reach climate targets, recent legal developments could be game changers. They demonstrate that Germany is serious about promoting hydrogen and developing it into an important pillar of climate-neutral energy supply.

As Germany strives for a prominent global position in hydrogen technologies, the development of its hydrogen infrastructure will significantly shape its energy landscape, aiding a sustainable, low-carbon future. Streamlined and expedited permission procedures for pipelines and storage facilities will be key to aligning ambitious policy intentions with implementation goals. Picking up speed, then, will be pivotal to ensure that Germany's hydrogen economy soars high rather than glides low, fuelling even more ambitious transition objectives in the process.

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