PRESS RELEASE

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INES transmits detailed analysis of the hydrogen core network

As part of a consultation process on the draft application for the hydrogen core network, INES submitted a statement in the form of a detailed analysis to the Federal Network Agency (Bundesnetzagentur). The detailed analysis makes clear that the hydrogen core network is designed for a longer-term demand perspective far beyond 2032. The assumed electrolysis and terminal capacities are in line with this perspective. While the import capacities at border crossing points are dimensioned beyond the longer-term demand perspective, the plans for hydrogen storage only include currently known projects. By taking greater account of storage capacities and a reduction in import capacities, the transport requirements in the selected load cases for the design of the hydrogen core network could be reduced.

The development of a hydrogen infrastructure shall take place with the planning and construction of a hydrogen core network. A current draft law stipulates that the transmission system operators (TSOs) must submit an application to the Federal Network Agency (Bundesnetzagentur, BNetzA) with measures for the construction of the hydrogen core network after the law comes into force. In order to facilitate prompt approval after submission of the formal application, the TSOs have already modeled the hydrogen core network and submitted a draft application to the BNetzA on 15 November 2023. The BNetzA has made this draft application available for consultation until January 8, 2024.

As part of the consultation process, INES drafted a detailed analysis of the draft application for the hydrogen core network and submitted it to the BNetzA as a statement. The INES detailed analysis comes to the following key conclusions:

- The maximum hydrogen consumption of 80 GW_{th} or 269 TWh_{th} assumed in the planning is likely to significantly exceed the actual hydrogen demand in 2032. This is therefore a demand perspective for grid design that can only be expected for much later years.
- For domestic hydrogen production via electrolysers, feed-ins are assumed for the year 2032 (amounting to 88 TWh_{th}), which are not expected until much later. This planning assumption is in line with the assumed longer-term demand perspective.
- The assumed terminal capacities of just under 16 GWh_{th}/h for hydrogen imports are reasonable in view of the longer-term demand perspective.

- The assumed import capacities at cross-border interconnection points of over 58 GWh_{th}/h could only be utilized to an annual average of just under 12 percent despite the longer-term demand perspective. The interconnection points therefore appear to be oversized many times over, although the design case is based on a target system in 2045 or 2050.
- The assumed hydrogen storage capacities of around 8 GWh_{th}/h (withdrawal capacities) only cover just under 17 percent of the flexibility requirements that could arise from the planned demand perspective of 49 GW_{th}. As the core grid planning goes far beyond the 2032 period in all other aspects, it seems inconsistent that the core grid planning was only based on currently known hydrogen storage projects.
- In the "Winter" load case, a very high utilization of extensive import capacities in the North region is assumed, which causes transport requirements between North and West of almost 23 GW_{th}. These transportation requirements can be reduced considerably if import capacities in the North region are substituted by storage capacities in the West region. Similarly, the transportation requirements between the North and East regions could be reduced.
- The autumn load cases reveal that the very large import capacities on which the grid planning is based require extensive flexibility on the demand side in the event of full regional utilization. In particular, the two autumn load cases North and West show that a significant increase in consumption loads of up to 21 GW_{th} is required if hydrogen storage capacities are insufficiently assumed.

Based on the analyses carried out, INES recommends implementing the following measures to reduce risks in hydrogen network planning:

- The assumed demand perspective should be reclassified in terms of time, as it is rather a longer-term demand perspective that is not expected until well after 2032.
- Based on the longer-term demand perspective, a well-founded analysis of hydrogen sources outside Germany should be carried out in order to make an appropriate decision on the allocation of import capacities (interconnection points and terminals).
- Storage capacities should replace import capacities that have so far been planned for the provision of flexibility in order to optimize transport requirements in the hydrogen network. To this end, it is necessary to align the assumed storage capacities with the longer-term demand perspective. The assumed scope of hydrogen storage capacities (currently known projects) does not match the depicted demand perspective, which extends far beyond the year 2032.
- A financing concept should generally prevent TSOs from shifting the economic risks of planning errors to other players (state, natural gas market). Cross-subsidization should therefore be avoided and appropriate risk sharing should

be ensured by means of a deductible on the shortfalls in the amortization account.

Sebastian Heinermann, INES Managing Director, comments on the publication as follows: "*The hydrogen grid is a key element of the market ramp-up. If the grid is designed for a demand perspective far beyond 2032, then all components, and thus also future hydrogen storage systems, should be considered in line with this perspective. The load cases clearly show the high transport requirements that can arise if hydrogen storage is not given sufficient consideration and very large import capacities are planned instead. As no supply analysis beyond Germany has been presented in the planning, it remains unclear whether flexibility is available abroad to the extent required and could be imported.*"

ABOUT US

INES is the association of gas and hydrogen storage system operators in Germany. INES' members represent over 90 per cent of German gas storage capacities and account for about 25 per cent of gas storage capacities in the European Union. INES' member companies also push the development of underground hydrogen storage in numerous projects and thereby form pioneers in this important technology field for the energy transition.

The members of INES are astora GmbH, bayernugs GmbH, Enovos Storage GmbH, Erdgasspeicher Peissen GmbH, Etzel-Kavernenbetriebsgesellschaft mbH & Co. KG, EWE Gasspeicher GmbH, HanseWerk AG, OMV Gas Storage Germany GmbH, NAFTA Speicher GmbH & Co. KG, RWE Gas Storage West GmbH, STORAG ETZEL GmbH, Storengy Deutschland GmbH, Trianel Gasspeicher Epe GmbH & Co. KG, USG Blexen GmbH, Uniper Energy Storage GmbH and VNG Gasspeicher GmbH.

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