Contribution ID: e5a0bdef-167e-4b86-9fb9-999b81ecef77
Date: 31/03/2025 15:05:44

Public consultation on inter-temporal cost allocation mechanisms (ICA) for financing hydrogen infrastructure

Fields marked with * are mandatory.

Introduction

Why are we consulting?

The hydrogen and gas market Regulation enables member states to allow hydrogen network operators to recover the costs of the network over longer periods of time than usual (Article 5(3)). This approach, known as the intertemporal cost allocation mechanism, is intended to address the challenges of early-stage hydrogen network development. ACER has been tasked with providing a recommendation on the methodologies for this mechanism by 5 August 2025, with updates issued every two years if necessary.

To ensure its recommendation is informative and effective, ACER is seeking input from stakeholders on key elements of the intertemporal cost allocation mechanisms. The public consultation will run from **10 to 31 March 2025**. ACER will evaluate the feedback received and use it to inform its recommendation.

In case of additional questions on the public consulation please contact ACER at **PC_ICA@acer.europa.eu**
.

Why are intertemporal cost allocations useful?

In natural gas and electricity transmission networks, most investments are made by transmission system operators (TSOs) who have to offer the available capacity to all users. They then recover the costs to build and operate the network via network tariffs paid by network users. Regulatory authorities approve these tariffs, or the methodologies TSOs use to calculate them. Tariffs are normally adjusted regularly (often annually) to account for changes in network utilisation and operational costs. Network users thus guarantee that TSOs will recover their investment and operating costs over time. This approach has been successful due to the relatively predictable demand for electricity and gas in the short to medium term.

Hydrogen pipeline transmission networks are considered more efficient compared to alternative options such as truck transport for long distances, hence they make sense for the development of an integrated European hydrogen market. The EU hydrogen strategy and the national hydrogen strategies of several member states foresee the development of hydrogen transmission networks connecting hydrogen supply (including import terminals) and demand centres. The supply cost of renewable and low-carbon hydrogen will also vary depending on local conditions, availability of cheap resources (renewable energy or natural gas respectively) and proximity to infrastructure (import terminals, hydrogen storage, CO_2 sequestration facilities). This further enhances the need for hydrogen networks.

Currently however, sustainable hydrogen is not competitive, leading to significant uncertainty regarding the future level and growth rate of demand. During the early stages of the sector development, demand for hydrogen will be relatively low compared to the capacity of the network resulting in disproportionately high initial network tariffs if traditional calculation methodologies are applied (1). This could further discourage users from transitioning to hydrogen.

The intertemporal cost allocation mechanisms are introduced to lower network tariffs during early stages, levelling them over an extended period. This ensures that the tariffs are affordable in the early stages and that the network costs are fairly distributed between current and future users. Notably, the hydrogen and gas market Regulation foresees the application of intertemporal cost allocation mechanisms only for hydrogen pipeline networks (i.e. other necessary hydrogen infrastructure, such as storage and terminals, is not included in the definition of hydrogen networks).

How does an intertemporal cost allocation mechanism work?

The only existing intertemporal cost allocation mechanism to date is the German WANDA scheme. The Danish regulatory authority (DUR), in collaboration with the hydrogen network operator Energinet, is also working on a similar mechanism that introduces a startup revenue cap. As hydrogen network development progresses, more member states may adopt intertemporal cost allocation mechanisms.

The primary goal of an intertemporal cost allocation mechanism is to mitigate high network tariffs during the ramp-up phase of the hydrogen market and to distribute the network costs in a fair way between the early adopters of hydrogen and future users. The mechanism works by shifting the recovery of a portion of the network annuities from the early years of operation to later periods. This is necessary since the revenues collected through the moderate tariffs set by the mechanism during the early years of low demand are not enough to cover the full costs. The deficits incurred during the initial ramp-up phase are typically placed in a separate regulatory account. This account is balanced over time as hydrogen demand increases and sufficient revenue is generated.

The intertemporal cost allocation mechanism may facilitate the development of the hydrogen market by keeping the network tariffs at affordable level during the early stages. However, this approach introduces significant risks for hydrogen network operators, as they are not able to recover their full costs during the initial years. This initial cost recovery gap can be financed by debt which is repaid with tariff over-recoveries in the future. Due to the high risks involved for hydrogen network operators, the intertemporal cost allocation mechanisms may also be complemented by additional support measures, such as state guarantees (2).

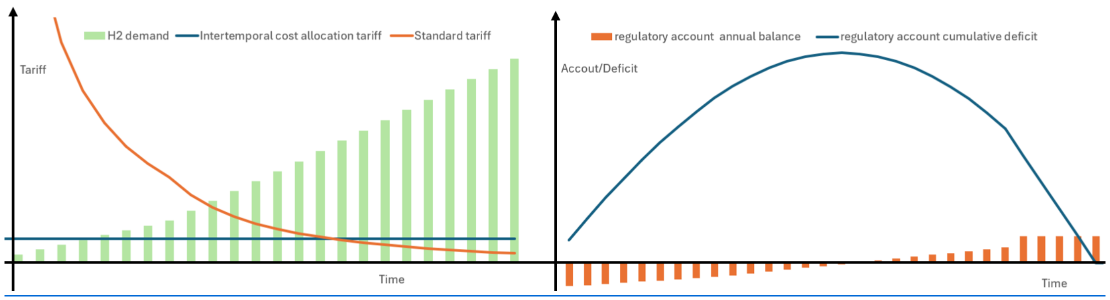
Notes:

(1) As a conceptual rule of thumb, the network tariffs can be considered as the division of the total network costs (e.g. in euros) divided by the utilisation of the network (e.g. in kWh/h/year).

(2) In the German scheme for example the liquidity is provided by the German development bank, KfW, via an “amortization account”. While the intertemporal cost allocation mechanism foresees the recovery of the provided liquidity by 2055 solely via the network tariffs, the German Federal State provides additional guarantees in case this is not possible, up to a maximum share of 74%.

Figure 1: Illustrative example of an intertemporal cost allocation mechanism depicting on the right the difference between the standard tariff and a lower fixed tariff for the entire duration of the mechanism and on the left the annual balance and the cumulative deficit of the regulatory account.

PC-ICA.png



Introductory questions

* **Name and Surname of the contact person**

Octav Baciu

* **Email address**

oba@iogp.org

* **Name of organisation / company**

IOGP Europe

Type of organisation

- ( ) Governments,
- ( ) NRAs,
- ( ) Gas TSOs,
- ( ) HNOs,
- ( ) HDNOs,
- ( ) Gas DSOs,
- ( ) financial institutions (banks, funds etc),
- ( ) H2 producers,
- ( ) H2 users,
- ( ) H2 traders,
- (•) industry associations consumer associations,
- ( ) academia,
- ( ) individual person,
- ( ) other (please specify)

* **Country**

- (•) EU-27
- ( ) Other

* **Please specify the country**

- ( ) AT - Austria
- (•) BE - Belgium
- ( ) BG - Bulgaria
- ( ) HR - Croatia
- ( ) CY - Cyprus
- ( ) CZ - Czechia
- ( ) DK - Denmark
- ( ) EE - Estonia
- ( ) EU - European Union, for associations covering all EU
- ( ) FI - Finland

- FR - France
- DE - Germany
- EL - Greece
- HU - Hungary
- IE - Ireland
- IT - Italy
- LV - Latvia
- LT - Lithuania
- LU - Luxembourg
- MT - Malta
- NL - Netherlands
- PL - Poland
- PT - Portugal
- RO - Romania
- SK - Slovak Republic
- SI - Slovenia
- ES - Spain
- SE - Sweden

Data protection

ACER will process personal data of the respondents in accordance with Regulation (EU) 2018/1725, taking into account that this processing is necessary for performing ACER's consultation tasks. More information on data protection is available on ACER's website and in ACER's data protection notice.

ACER will not publish personal data.

Consent to the processing of personal data

☑ Your personal data may be processed by the Agency.
Please refer to privacy statement to learn about such processing and your rights.

Confidentiality

Following this consultation, ACER will make public:

- the number of responses received;
- company names, unless they should be considered as confidential;
- all non-confidential responses; and
- ACER's evaluation of responses. In the evaluation, ACER may link responses to specific respondents or groups of respondents.

You may request that the name of your company or any information provided in your response is treated as confidential. To this aim, you need to explicitly indicate whether your response contains confidential information. **You will be asked this question at the end of the survey.**

☑ I have read the information on data protection and confidentiality provided in this section.

A. Risks underpinning the development of hydrogen networks

Infrastructure planning and development relies largely on demand forecasts over a long period of time. Long term commitments by network users can mitigate severe demand uncertainties and thus significantly improve projects bankability. In the case of hydrogen however, various risks discourage potential hydrogen users from agreeing to supply contracts with an adequately long duration to secure financing of hydrogen networks. Some commonly identified risks of the hydrogen sector are listed below:

- **Price risk**, driven by uncertainties over the competitiveness of green and low-carbon hydrogen as a feedstock or energy carrier. It is related to the cost of alternatives (e.g. cost of fossil fuels and CO2 emission allowances), the cost of technology (electrolysers, storage, carbon capture and sequestration, renewable electricity) and to some extent also to regulatory provisions (e.g. renewable hydrogen sustainability rules).
- **Technology risk**, both in terms of the cost reduction potentials of production technologies (through innovation and up-scale) and in terms of alternatives for end-use technologies (e.g. direct electrification technologies for iron production could eliminate the need for hydrogen in the sector).
- **Lack of infrastructure**, including pipeline network, terminals and storage facilities, that restricts the deployment of hydrogen and prevents the development of efficient trade.
- **Regulatory risk**, related to the uncertainty and lack of clarity over the market rules (e.g. regarding network tariffs) or the current lack of harmonised approaches across the EU (and the anticipation of harmonisation rules in the future). Over-regulation and over-harmonisation may also constitute a barrier to the market development in these early stages.
- **Policy risk**, related to changes in the European and national policies, global hydrogen market dynamics and potential de-prioritisation of the hydrogen economy.

1. In your view, what are the main risks faced the following parties:

- **hydrogen end- users?**
- **hydrogen suppliers?**
- **hydrogen network operators?**
- **other hydrogen infrastructure developers (storage, terminals)?**

Please elaborate.

1800 character(s) maximum

End-users:
- Lack of access to affordable clean hydrogen driven by restrictive regulatory mandates that limit the use of the most cost-effective clean hydrogen options, resulting in uncertain price competitiveness of clean hydrogen
- Uncertain market incentives for low-carbon products to stimulate demand and pass costs to final consumers.
- Technology risk for end-users not currently using hydrogen, stemming from the fact that converting to hydrogen may not be the best decarbonization option.

Suppliers:
- Lack of a viable business case due to high production costs and regulatory restrictive rules both for renewable and low-carbon hydrogen production (e.g. draft DA on low-carbon hydrogen rules, DA on RFNBO rules)
- Insufficient dedicated support mechanism for low-carbon hydrogen producers;
- Demand uncertainty in terms of both availability and geographical location
- Regulatory framework and certification schemes uncertainties that may persist for a long time (coupled with demand uncertainty) including: certification, methane intensity calculation, and future regulation changes.

Network operators:
- Low volumes due to limited supply and demand, driven partly by high production costs and technology-prescriptive (RFNBO only) legislation that do not yet justify large-scale infrastructure investments, creating risks of underinvestment and underuse, leading to high costs for early users
- Risk for CAPEX-intensive investments without a clear view of market development

Other infrastructure developers (storage, terminals):
- High capital costs, uncertain demand, and unclear trade and certification rules create investment risks, potentially leading to stranded assets or inefficient infrastructure deployment.

2. What are the main reasons preventing <u>hydrogen end-users</u> from signing long term hydrogen off-take agreements? Please elaborate.

1800 character(s) maximum

- High hydrogen production costs: Lack of access to cost-competitive and stable clean hydrogen supply makes it difficult for end-users to commit to long-term purchases without the risk of becoming uncompetitive, especially in globally traded sectors like steel, chemicals, and fertilizers.
- Lack of demand-side incentives for low-carbon products: There is no clear market reward for using clean hydrogen-based products (e.g., low-carbon steel, ammonia, or fuels). Without carbon intensity-based product standards or a premium market, end-users lack the confidence that they recover higher hydrogen costs from their customers in the long run.
- Limited supply and infrastructure readiness: The currently low levels of hydrogen production and insufficient infrastructure developments make it difficult for buyers to ensure a stable and reliable long-term supply, further deterring commitments. Without confidence in timely delivery or transport mechanisms, off-take agreements appear risky.
- Regulatory uncertainty: The regulatory framework currently prioritizes RFNBO hydrogen, while other cheaper low-carbon hydrogen pathways are marginalized. Uncertain certification requirements that are linked with yet-to-be-developed rules create uncertainty around which hydrogen types will be eligible, making it risky for end-users to lock into long-term agreements.

3. What are the main reasons preventing hydrogen suppliers from signing long term capacity booking contracts (e.g. ship-or-pay contracts)? Please elaborate.

- Persisting high cost of clean hydrogen production makes it difficult to find customers willing to sign long-term agreements;
- Uncertainty on the geographical distribution of hydrogen demand;
- Limited availability of financial instruments for producers to make clean hydrogen cost-competitive;
- Uncertainties on the level of transportation capacity tariffs and on the functioning of last resort mechanisms /public guarantees, and on their capability to prevent tariff spikes;
- High production costs and insufficient long-term demand visibility to create viable business cases underpinning the investments and bookings;
- Uncertainty of timely realization of infrastructure required to reach customers;
- Regulatory uncertainties for low-carbon hydrogen production rules also makes difficult to sign long-term agreements.

B. Scope of intertemporal cost allocation mechanisms

Current market uncertainties prevent the development of hydrogen networks purely on market basis and hydrogen network is developed on a regulated basis. While the development of infrastructure is considered as an enabler of the EU hydrogen market, developing infrastructure in such uncertain framework, and with limited long-term commitments by network users, creates a risk for building a network that is later not fully utilised. Intertemporal cost allocation mechanisms could be enablers of network development however, they deal primarily with the demand ramp-up asymmetries and do not eliminate this risk. Developing infrastructure with a gradual ("incremental") approach (based on specific and more certain demand needs, possibly backed by binding commitments) might reduce the risk of future underutilisation. However, such an incremental approach could increase network development costs (untapped economies of scale) and prevent optimal market development.

4. What strategy is preferable for the development of hydrogen transmission networks?

- ○ **Gradual approach based on largely verified demand needs (e.g. binding off-take commitments).**
- ○ **Core network developed at an early stage to allow for market development.**
- ● **Other (please elaborate)**

4.1. Please elaborate if other.

Gradual approach is the most efficient option to address investments where they are most needed and limit the risk of stranded assets. Any investment and developments of hydrogen networks should be made based on sufficiently certain demand. However, as many elements in hydrogen supply chains will usually need to be developed in parallel, identifying binding commitments may restrict developments.
- On the other hand, building infrastructure based on non-binding agreements poses too much risk. Furthermore, deploying a large network at a very early stage of market development could also prove economically not sustainable, considering that suppliers and offtakers are likely to need public support for several years.
- To de-risk and stimulate chain development, interested shippers should commit to e.g. share FEED cost or commit to pay upfront a reasonable transport reservation fee (which can be accounted towards actual booking) to ensure a certain level of commitment from shippers whilst acknowledging the parties’ uncertainty in this nascent market.

5. What criteria should be used to identify the infrastructure to be financed by inter-temporal cost-allocation mechanisms? Please elaborate.

- Projects should be based and built along sufficient capacity interest from customers, which is underpinned by a reasonable upfront commitment to pay reservation fees or binding bookings.
- Both transport and distribution networks will need to be financed by inter-temporal cost-allocation mechanisms, following a gradual approach driven by the development of hydrogen demand (also in terms of geographical distribution).

6. What measures, besides binding open seasons, can enhance the accuracy of hydrogen demand projections over time and consequently optimize the planning of hydrogen networks?

- Regular updates to hydrogen transport demand are needed to adjust grid planning as projects mature or change;
- Market surveys - could request shippers / developers to provide a confidence level to their demand projections;
- Estimates of the proportion of demand that will not be met by on-site or local production, and will therefore require a transport network;.
- There may also be opportunities to modify or even stop infrastructure projects while the infrastructure is still under development, should underpinning hydrogen projects get significantly reduced in scope or canceled – even despite any upfront commitment;
- Carbon contracts for difference could be another instrument in order to signal demand projections over time: if companies conclude such contracts and rely on the use of hydrogen to reach their decarbonization goal, a good hint is given on their hydrogen needs over the duration of those contracts – which are typically 10 to 15 years.

7. Should an inter-temporal cost allocation mechanism be used for transmission networks, distribution networks or both? Please explain.

As already mentioned in the answer to question 5, we believe that an inter-temporal cost-allocation mechanism will be needed by both transmission and distribution networks, since both face similar risks (limited booking requests in early years & uncertainty on demand development). Assuming that initial projects will be centering around transmission networks, the application for distribution networks may come at a later stage.

C. Intertemporal cost allocation network tariffs

By shifting network cost recovery to the future, intertemporal cost allocation mechanisms aim to ensure that hydrogen networks can eventually be funded by network tariffs paid by network users. These network tariffs shall reflect the network financing needs and the willingness to pay of the users. To provide appropriate signals and incentives to network users and enable booking commitments, intertemporal cost allocation mechanisms should be designed to provide clarity and certainty on the cost for transporting hydrogen over their whole implementation period. At the same time, regular re-evaluations and re-calculations could help minimising the risk of revenue shortfalls due to a mismatch between initial assumptions and real developments, although potentially affecting the long-term certainty.

Intertemporal cost allocation mechanisms rely on investment and operating costs based on forecasts but uncertainties in demand and limited experience with developing hydrogen network might lead to significant differences between actual and projected costs. To facilitate network investments, operators can be safeguarded against such risk of cost overruns. However, this would possibly require a revision the network tariff levels which may have a negative impact on tariff certainty and stability.

8. What tariff levels can be considered affordable and competitive in the early stage of the hydrogen market development and what methodology can be used to calculate these levels?

- As long as a large production cost gap persists between clean and grey hydrogen (as well as other alternatives), it's difficult to say what tariff level could be affordable because any transport tariff would only add up to the cost gap and make it wider (considering that, currently, production and consumption of grey hydrogen are usually located nearby).
- Particularly during early stages of market development, the affordability of the transport tariff depends on the possibility to consider it as a "pass-through" cost in the design of support mechanisms (e.g. CfD to incentivize hydrogen production).
- This should depend also on the specific location/market price level, transport demand, and commitment level because these factors may influence the affordability of transport tariffs for hydrogen users.

9. What design elements of the intertemporal cost allocation mechanisms can facilitate recovering the full investment costs in view of the sector's uncertainties and the potential absence of long-term commitments?

- The most effective instrument to mitigate network operators' risks from the high demand uncertainties affecting the nascent hydrogen market is introducing a "last resort guarantee" backed by public funding. Such a mechanism would be required to ensure full cost recovery and remuneration for infrastructural operators and in order to prevent excessive increases and volatility in transportation tariffs that would otherwise further discourage network users from making medium to long-term commitments.
- Cost coverage from the mechanism should be limited to viable projects underpinned by sufficient – ideally long-term – bookings or reasonable commitments.

10. How should the risk of potential cost overruns for infrastructure developed under intertemporal cost allocation mechanisms be dealt with and who should bear this risk (e.g. hydrogen network operators, users of the hydrogen network, state/governments)?

- To encourage investment, network operators should not or only bear a small portion of such risk. If the transport business is regulated, rules for cost increases should already exist
- The risk of cost overruns should fall (at least in part) on a public entity, due to the unavailability of effective hedging/guarantee instruments that can help infrastructure developers deal with it.

D. Cross border elements

The hydrogen and decarbonised gas market package defines that as of 2033 the European hydrogen markets shall be organised according to the entry-exit model, largely similar to European gas markets. The package also envisages the development of market rules, including rules for harmonised hydrogen transmission network tariffs. In the absence of harmonised rules, the conditions established in the intertemporal cost allocation mechanisms will impact hydrogen transported across EU member states (i.e. cross-border trade and market integration).

11. What are the relevant cross-border impacts to consider when designing intertemporal cost allocation mechanisms?

- Intertemporal cost allocation mechanisms may have cross-border effects as they influence cross-border trade and the EU market integration. Moreover, intertemporal cost allocation mechanisms may be designed to accommodate cross-border network infrastructure.
- Cross-border risk and cost allocation is necessary in this context and should include demand forecasts provided by neighboring countries. Indeed, projects with a cross-border dimension do not rely solely on domestic consumption points to calculate cost recovery. Coordinated planning and selection of projects at international level, based on realistic demand scenarios and assumption, and facilitated by ACER and ENNOH should be encouraged.
- One of the most significant cross-border impact is possibly the creation of a "pancaking" of transport tariffs that will hinder cross-border hydrogen trade, disadvantaging off-takers located in the furthest areas from those where clean hydrogen is cheaper to produce.

15. Should intertemporal cost allocation mechanisms be harmonised across the EU? If yes which elements of the intertemporal cost allocation mechanisms should be harmonised (e.g. assessment of needs, tariff structures, duration)? Please elaborate.

It is preferable to maintain homogeneity of criteria across the EU when implementing intertemporal cost allocation mechanisms. Considering the different stages of development of hydrogen markets in each Member State (MS), cost allocation parameters that help a particular MS, may not help the market in another MS (e.g. various levels of hydrogen demand, timing). The assessment of needs that drive network development and the structure of transportation tariffs are likely to be addressed with the most possible homogeneous criteria. The duration of infrastructural cost recovery and the specific temporal profile of the allowed revenues might potentially be adjusted for each national network, with the aim of ensuring proper tariff levels and facilitating cross-border trading while maintaining a general steering/overview at the EU level. (see 11)

13. Are locational signals (tariffs differentiated depending on the location in the network) relevant for the development of the hydrogen market?

While tariffs may need to vary between MS to stimulate market growth due to different levels of affordability, the same tariff should apply for all infrastructure supported by the same allocation mechanism to avoid market distortion and to create a level playing field.

While the intertemporal cost allocation mechanisms are mostly national in scope, they may have cross-border effects as they influence cross-border trade and the EU market integration. Moreover, intertemporal cost allocation mechanisms may be designed to accommodate cross-border network infrastructure.

14. What negative impacts on cross-border trade and market integration can result from the application of national intertemporal cost allocation mechanisms?

- Evolution of tariffs following different "speed" and sending incoherent signals to market operators or creating pancaking effects that would distort cross-border trade. In order to prevent such negative effects, national intertemporal cost allocation mechanisms should be implemented subject to a general steering /overview at the EU level.
- As mentioned at point 12, harmonization between national mechanisms is key to facilitate the development of cross-border infrastructure to the extent this is required for projects to materialize (e.g. connecting

suppliers with customers). Using harmonized mechanisms will provide certainty for grid developers, suppliers, and customers. As long as transparency on tariffs and the progress of grid development is provided, national mechanisms can very well be based on different parameters. Also, initial supply deals will likely be on long term contracts and short term cross-border trade will only grow once physical connections have been established and volumes increase.

15. What type of coordination at EU level is necessary to enable cross-border trade and market integration when using intertemporal cost allocatin mechanims?

- As mentioned under points 5 and 9, the intertemporal cost allocation mechanisms should only help the development of the required hydrogen infrastructure. The hydrogen market should be allowed to develop freely with only minimal regulatory oversight.
- In cases where network operators choose to apply an element of cross-border cost allocation, the allocation of cost and revenues and the transfer of resources between countries, as function of the benefits, would need to be agreed ex ante. This exercise might be complex, considering that the hydrogen technology pathway is not clear yet. Another important point to consider is a regular monitoring and assessment of the cost-benefits associated to cross-border projects, to adjust cross-border cost allocation.
-see also points 11, 12 (15 as indicated in this from) and 14.

16. What are the key elements that should be considered when using intertemporal cost allocation mechanisms for cross-border infrastructure projects?

-See points 12 (15 as indicated in this from), 14 and 15.

E. Final questions

17. Which of the following elements of an intertemporal cost allocation mechanism are most important (select in order of importance, from high to low):

Use drag&drop or the up/down buttons to change the order or accept the initial order.

- Transparency and reproducibility
- Flexibility and adaptability (scalable tariffs to ensure cost recovery)
- Simplicity and understandability
- Maintaining locational price signals (ensure cheaper supply routes are used first)
- Stability and predictability
- Other (please identify)

17.1. Please elaborate if other.

18. Please provide any other view relevant to the topic of the consultation.

1800 character(s) maximum

Question on confidentiality

* **ACER evaluates and may publish the received input. Do you consent that the submitted input is published?**

- (●) Yes, ACER may publish the submitted replies.
- ( ) Yes, ACER may publish the submitted replies **anonymously**.
- ( ) No, ACER may not publish the submitted replies.

* **Does your submission contain confidential information?**

- ( ) Yes
- (●) No

Useful links

EU Hydrogen Strategy (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0301)

German Wanda Scheme (https://www.bundesnetzagentur.de/EN/RulingChambers/GBK/Level1/WANDA/start.htm
~:text=The%20WANDA%20determination%20creates%20rules,investments%20in%20the%20core%20network)

Contact

Contact Form