



International Hydrogen Policy Tracker Database Codebook

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The present document entails detailed instructions to fill in the Hydrogen Policy Landscape Database developed for the International Hydrogen Policy Tracker (internationalhydrogenpolicy.net) by collecting and coding interventions of the hydrogen policy landscape of a given country. The coding of all these interventions is based on a categorization system. This codebook is a supplementary resource to the Excel Template that is provided to each user to collect and code the data.

What is the International Hydrogen Policy Tracker?

The International Hydrogen Policy Tracker (internationalhydrogenpolicy.net) was developed within the Global Hydrogen Potential Atlas “HyPat” project, funded by the Federal Ministry of Education and Research (BMBF). It compiles and systematizes data on the policy and regulatory landscape in the hydrogen sector in major frontrunner countries within the global hydrogen economy, located in different regions of the world. The methodology for compiling and coding the data was developed within the context of the project and is detailed in this codebook. On this basis, the Hydrogen Policy Tracker's country dashboards provide an overview of the hydrogen policy landscape in ten frontrunner countries. Country graphs can be compared using a country comparison tool.

Why it matters

Particularly in the initial phase of the development of a global hydrogen economy, market developments in the hydrogen sector, as in other emerging green industries, will be strongly influenced by policy developments. Unlike in predominantly market-driven industries and technology fields, the development of demand for green hydrogen will not develop without political support. The role of policy in driving hydrogen demand is complemented by support measures on the supply side, e.g. to promote research and development, demonstration projects and infrastructure. It is this interplay between policy, market and industrial development that will determine the competitiveness of technical solutions as well as the suppliers of these solutions.

The International Hydrogen Policy Tracker provides a tool for systematic characterization and comparison of policy instrument in major frontrunner countries. At an early stage of technology and market development, this provides important information about general development trends and the political priorities of major countries. For example, a distinction can be made between more technology-open and technology-specific, or more production- or innovation-oriented policy patterns. For these and other policy characteristics, the individual policy and regulatory instruments have been coded, allowing a visual representation of policy patterns.

Methodology

The Hydrogen Policy Tracker provides a comprehensive database of policy instruments in ten countries. These interventions have been coded based on a categorization system that distinguishes different instrument types, the segments of the hydrogen value chain targeted by the policy interventions as well as their geographic scope (domestic vs. International). Instrument types and segments of the hydrogen value chain are further divided into sub-categories, allowing for additional analysis. The categorization system as well as the instructions for coding are laid out in a codebook with detailed instructions. A codebook with more detailed information is available upon request.

The HyPat Project

The Global Hydrogen Potential Atlas “HyPat” (hypat.de) project is funded by the Federal Ministry of Education and Research (BMBF) with the main objective of providing an assessment of potential partner countries for Germany's future hydrogen economy and analyze their respective production and supply chains. Besides examining the global techno-economic potential and hydrogen value chains, the project considers potential partners' needs and objectives. The project also includes an analysis of the broader international market and policy developments and their implications for the global ramp-up of hydrogen supply and demand. In this context, the RIFS Potsdam developed the International Hydrogen Policy Tracker to compile and systematize data on the policy and regulatory landscape of the hydrogen economy in major hydrogen frontrunner countries in different regions of the world. Almudena Nunez was responsible for leading the data collection and coding under the supervision of Prof. Dr. Rainer Quitzow.

The RIFS Potsdam and the Research Group on Energy and Industrial Transformation

The Research Institute for Sustainability at the Helmholtz Centre Potsdam (www.rifs-potsdam.de) conducts research with the goal of understanding, advancing, and guiding processes of societal change towards sustainable development. Our research approach is transformative, transdisciplinary, and co-creative: RIFS researchers collaborate with diverse actors from science, policymaking and public administration as well as business and civil society to develop a common understanding of sustainability challenges and generate potential solutions.

The Research Group „Geopolitics of Energy and Industrial Transformation“ at RIFS Potsdam investigates how the global energy transition is affecting the international political economy of energy and identifies implications for foreign policy and international cooperation. It focuses in particular on the development of industrial strategies to reach greenhouse gas neutrality targets against the background of increasing geoeconomic rivalry. An important example for this is the development of an international hydrogen economy and related political and economic change. The team combines disciplinary expertise from the fields of political science, economics and the environmental and physical sciences with expert knowledge from practitioners and policy makers in the energy sector. By engaging practitioners from government, business and civil society in our transdisciplinary research processes, we co-create actionable policy proposals and solutions.

Objectives of the Hydrogen Policy Landscape Database:

- Data collection on policy-related interventions
- Development of country dashboards on hydrogen Policies
- Development of an interactive web-Interface for data usage
- Comparison of Germany with other front-runner countries using the dashboards

How does the Database work?

The database is a collection of policy interventions that are placed on the provided excel template by adding information of the interventions in English and coding them based on the different fields of the following main categories:

- Policy instruments - technology/sector
- Policy instrument - types

Coding Scheme: Overview

Policy Instruments - Technology/Sector:

1. Production General
 - 1.1. Hydrogen Production General
 - 1.1.1. Unspecified
 - 1.1.2. Electrolysis-General
 - 1.1.2.1. Unspecified
 - 1.1.2.2. PEM
 - 1.1.2.2.1. Unspecified
 - 1.1.2.2.2. Design-specific
 - 1.1.2.3. Alkali
 - 1.1.2.3.1. Unspecified
 - 1.1.2.3.2. Design-specific
 - 1.1.2.4. SOEC
 - 1.1.2.4.1. Unspecified
 - 1.1.2.4.2. Design-specific
 - 1.1.2.5. SMR with CCS
 - 1.1.2.6. Methane Pyrolysis
 - 1.2. Production of Hydrogen Derivatives
 - 1.2.1. Derived Products-Power-to-X-Unspecified
 - 1.2.2. Methanol
 - 1.2.3. Fischer Tropsch
 - 1.2.4. LOHC
 - 1.2.5. Ammonia
 - 1.2.6. Other
 2. Usage General
 - 2.1. Usage-Technology
 - 2.1.1. Unspecified
 - 2.1.2. Fuel Cells
 - 2.1.3. Other
 - 2.2. Usage- Sector
 - 2.2.1. Unspecified
 - 2.2.2. Transport/Mobility
 - 2.2.2.1. Unspecified
 - 2.2.2.2. Passenger vehicles
 - 2.2.2.3. Buses
 - 2.2.2.4. Rail
 - 2.2.2.5. Trucks
 - 2.2.2.6. Aviation
 - 2.2.2.7. Maritime
 - 2.2.3. Industry
 - 2.2.3.1. Unspecified
 - 2.2.3.2. Steel
 - 2.2.3.3. Chemical
 - 2.2.3.4. Cement
 - 2.2.3.5. Other
 - 2.2.4. Heat
 - 2.2.4.1. Buildings
 - 2.2.4.2. Industrial processes
 - 2.2.4.3. Power Generation
 3. Transport and Storage Infrastructure
 - 3.1. Transport Infrastructure-General
 - 3.1.1. Unspecified
 - 3.1.2. Pipeline
 - 3.1.3. Road
 - 3.1.4. Maritime
 - 3.2. Storage Infrastructure-General
 4. Multiple (at level 1)
 5. Multiple (at level 2)

6. Multiple (at level 3)
7. Multiple (at level 4)
8. International initiatives tag

Policy Instrument - Types:

1. Economy-Wide Instruments (e.g. CO2 Pricing, removal of fossil fuel subsidies)
2. R&D Promotion
 - 2.1. Tax Incentives
 - 2.2. Grants/Subsidies
 - 2.3. Other Instruments
3. Promotion of Investment
 - 3.1. Promotion of Hydrogen Production
 - 3.1.1. Tax Incentives
 - 3.1.2. Grants/Subsidies
 - 3.1.2.1. Auctions
 - 3.1.2.2. Other
 - 3.1.3. Regulatory Instruments
 - 3.1.4. Public Procurement
 - 3.1.5. Other Instruments
 - 3.2. Promotion of Hydrogen Use
 - 3.2.1. Tax Incentives
 - 3.2.2. Grant/Subsidies
 - 3.2.2.1. Auctions
 - 3.2.2.2. Other
 - 3.2.3. Regulatory Instruments
 - 3.2.4. Public Procurement
 - 3.2.5. Other Instruments
 - 3.3. Promotion of Transport and Storage Infrastructure
 - 3.3.1. Tax Incentives
 - 3.3.2. Grants/Subsidies
 - 3.3.2.1. Auctions
 - 3.3.2.2. Other
 - 3.3.3. Regulatory Instruments
 - 3.3.4. Public Procurement
 - 3.3.5. Other Instruments
4. Education and Information
 - 4.1. Education/Training
 - 4.2. Awareness-Raising
 - 4.3. Labelling
 - 4.4. Quality Infrastructure
5. Voluntary Agreements
6. Network/ Cluster Promotion
7. International Initiatives
8. International initiatives tag
9. Multiple (at level 1)
10. Multiple (at level 2)
11. Multiple (at level 3)

How does the collection and categorization/coding of the database work?

This codebook will provide detailed instructions to collect the interventions for the databases and how to code each of the interventions based on the categorization system tables presented above.

The interventions are collected in an excel template following the explanations for each tab and column provided on the table below named: [Data Collection](#).

General note on collecting: the main rationale collecting (as for coding) is that we want to avoid double-counting (multiplicity), there are cases where this is unavoidable, but we aim at abstaining from it as much as possible. In this vein, the instructions when collecting interventions for this objective are:

- i) We are not considering strategies, roadmaps, i.e. summaries of policy instruments as interventions, what we are considering as interventions are the specific actions, actual instruments mentioned in those strategies, roadmaps, etc.
- ii) If an intervention comprehends different “actions”/programs/etc. within it, we will single those out, i.e. each of those actions will be a separate entry/intervention, you will also see that this action will make the coding easier given that when one does this, that one intervention will probably be more focused on one specific sector and will probably be just one type of instrument (detailed instructions for this are given later in the document)

The interventions are to be coded based on the instructions of the table named [Categorization/ Coding Definitions and Instructions](#).

Data Collection

<i>Concept and/or Instruction</i>	<i>Explanation and Collection/Fill-in Instructions</i>	<i>Tab</i>	<i>Type of Text</i>
Main	<p>Explanation: The main tab serves as the first tab where the user can add the interventions.</p> <p>Collection/fill-in instruction: Use this tab as your main collection tab where you collect the information of the interventions as per the information asked in columns A to O.</p>	Main	Free Text
Date Added	<p>Explanation: In order to have a close reference regarding the date the intervention was added is important to make future references while also serves as a control mechanism to check if updates in the interventions have occurred compared to the date they were first added</p> <p>Collection/fill-in instruction: In this column enter the date of the addition of the intervention in the matrix, the format is NUMMERICAL and only the month and year are to be added in the following format: MM.YYYY.</p>	Main	Number: MM.YYYY
Hydrogen Specificity Degree	<p>Explanation: While there may be interventions that are directed hydrogen ones (specific for hydrogen), there are others that are indirectly focused on hydrogen (not specific for hydrogen) but do have an impact on it. Thus, this column serves to provide a quick overview on how specific the intervention is with regards to hydrogen.</p> <p>Collection/fill-in instruction: If the intervention is directly related to hydrogen write the number “1”, if the intervention is not directly related to hydrogen but has an impact on it write the number “2”.</p>	Main	Number 1/2
Federal/Provincial	<p>Explanation: In some country cases (i.e. Canada, the US, etc.) some interventions are issued at the Federal level and may others at the subnational level i.e. provincial/state/regional level. The priority is the collection of the interventions that occur at the Federal level. However, if provincial interventions (subnational level) are also collected due to their importance on the hydrogen policy landscape, it is paramount to identify which ones are issued at this level and which ones at the Federal one.</p> <p>Collection/fill-in instruction: If the intervention is one issued at the Federal level write in this column “Federal”, if the intervention is issued at the provincial/state/regional level (subnational level), write here “Provincial”. Be mindful to always write the words in this exact same way (Federal/Provincial) to be able to filter them correctly.</p>	Main	Federal/Provincial
Brief Explanation of the Intervention	<p>Explanation: This cell is where the main information of an intervention is provided.</p> <p>Collection/fill-in instruction: Write in this cell the name and a brief explanation of the intervention. The text in this cell should be kept to a maximum of 6-7 lines</p> <p><u>Important note:</u> The information written must be paraphrased or if it was written in the same form as the source (copy and paste), it should be written inside quotation marks: “example”, the source should be added in the column specified for the source.</p>	Main	Free Text
Focus	<p>Explanation: This cell is meant to give a quick overview of what the intervention is about, its focus.</p> <p>Collection/fill-in instruction: Write in this cell a word or a short sentence that provides a quick overview of what the intervention is focused on, for example: “Investment on Hydrogen Refuelling Stations”.</p>	Main	Free Text
Law/ Program that sustains it	<p>Explanation: Many interventions are laws or programs by themselves, and others can be based on laws, or programmes. The objective of this cell is to</p>	Main	Free Text

	<p>be able to quickly detect in which law or program an intervention is based or if the intervention is a law or program itself.</p> <p>Collection/fill-in instruction: Write here the name of the Law or Program that sustains the intervention (if given). If there is not a law or program that sustains it, leave this cell in blank. If the intervention is a program or law by itself write the name of it here.</p>		
Amount of funding	<p>Explanation: Some interventions may have allocated funding. An example of this are research programs in which a government entity allocates funding for the development of a specific research project.</p> <p>Collection/fill-in instruction: If the intervention is given a specific amount of funding it must be provided here, specifying the currency (either in word or symbol), for example 500€ or 500 euros. Consider that in the Amount of Funding column only entries with NUMBERS can be added. If the information is rather verbal or specifications/clarifications (for example that the amount funding changes in the many different stages/years of a research project) should be made, these specifications/clarifications have to be added in the “Brief Explanation of the Intervention” column. If the funding comes from different entities, in this column enter the total amount of funding in a NUMERICAL format, and in “Brief Explanation of the Intervention” write this specification, for example: Funding: (Federal Government 3000€, Utility 4000€). If there are different amounts of funding even from the same entity, write the total amount of funding in a NUMERICAL format here, and clearly specify the amounts in the “Brief Explanation of the Intervention” column, this applies too if the funding is dispersed in different points in time, or the funding type varies, for example, committed funding, dispersed funding, etc. Make all these clarifications in the “Brief Explanation of the Intervention” column. If there is no information of the funding or the intervention or it does not have an allocated funding, leave this cell in blank.</p> <p><u>Important note:</u> If the funding information source differs from the main source, this one should be added on the “Alternative Source” column and specify the name of the source in “Brief Explanation of the Intervention” column, for example: (funding source Agora Energiewende, see link in “Alternative Source”).</p>	Main	Number
Entity/Ministry that emitted it	<p>Explanation: The entity or ministry that emitted the intervention is the public body that issued the intervention.</p> <p>Collection/fill-in instruction: In this cell one must provide the name of the Entity/Ministry that emitted/issued the intervention. In cases where an intervention includes funding and the entity that emitted/issued the intervention is different than the one that provides the funding, please specify with parenthesis, for example: Ministry of Natural Resources (Emitted), Ministry of Education and Research (Funded). If it is the same entity that is charge of both things, there is no need to specify, simply write the name of the entity. If it is known that different entities emitted/issued the intervention and funded it, but there is only information of one of the cases, write the name of the entity from which the information is available and specify in parenthesis () if it Emitted or Funded. If several entities are involved in the emission and/or funding or the intervention, include them all, separating them with comma (.). If there is no information of the entity/ministry that emitted and/or funded the intervention, leave this cell in blank.</p>	Main	Free Text
Source	<p>Explanation: link to the direct and official source of the intervention.</p> <p>Collection/fill-in instruction: Here the user must provide the link to the direct source, this means that when another user clicks on that link it should lead to the direct and official source of the intervention.</p>	Main	Link

Alternative Source	<p>Explanation: in some cases, there is no direct and official link to the intervention, because it is not on the web, or the intervention was found on article, webinar, presentation, etc.</p> <p>Collection/fill-in instruction: In this column provide the link to that alternative source where the intervention was mentioned, for example an article. If there are many different alternative sources they can all be added here, they should be split as follows: [space];[space]. Additionally, in this cell the user can add the link of the source of the funding, issuing date, or any other detail of the information of the intervention that was found in a source different to the main one.</p>	Main	Link
Issuing Date	<p>Explanation: The issuing date is the date the intervention was published. This date may vary from the starting date.</p> <p>Collection/fill-in instruction: In this column provide the date of the issuing/publication of the intervention. If the whole issuing date is given (date, month year), please use the following format: DD.MM.YYYY. If there is just information of the year, provide the year in the following format: YYYY. If there is information on the month and year, provide it in the following format: MM.YYYY. If there is no information of the issuing date, the user should leave this cell in blank.</p>	Main	Number: DD.MM.YYYY
Starting Date	<p>Explanation: the date that the intervention got/gets active.</p> <p>Collection/fill-in instruction: in this column provide the date of the starting date of the intervention. If the whole starting date is given (date, month year), please use the following format: DD.MM.YYYY. If there is just information of the year, provide the year in the following format: YYYY. If there is information on the month and year, provide it in the following format: MM.YYYY. If there is no information of the starting date found, the user should leave this cell in blank.</p>	Main	Number: DD.MM.YYYY
End date	<p>Explanation: In many cases like laws there is not an end date specified, but in others, like research and development projects there is.</p> <p>Collection/fill-in instruction: In this cell the date when the intervention ends is to be given. Provide the date of the end of the intervention. If the whole end date is given (date, month year), please use the following format: DD.MM.YYYY. If there is just information of the year, provide the year in the following format: YYYY. If there is information on the month and year, provide it in the following format: MM.YYYY. If there is no information of the End date or this is not applicable, leave this cell in blank.</p>	Main	Number: DD.MM.YYYY
In 2023 Active	<p>Explanation: While there are interventions that were launched recently, others may have been issued in the past, or others have been issued recently but are not active yet. To make a current assessment of the interventions that are active in 2023, this column provides a quick reference to be able to filter the interventions that are active in 2023.</p> <p>Collection/fill-in instruction: Write "Yes" if the intervention is active in 2023, or "No" if it is not. If there is no information as to if the intervention is active in 2023, the user should leave this cell blank.</p>	Main	Yes/No
Are there country/ies engaged?	<p>Explanation: It can be the case that a certain intervention has an international component, whereby there are one or many countries involved and/or benefitted. This is an important component when assessing the international dimension of a country's foreign hydrogen policy dimension. This column serves to swiftly identify with which country or countries this intervention interacts.</p> <p>Collection/fill-in instruction: If the intervention has an international component and it is clearly mentioned with which country/ies interacts: when it is one country write here: the name of the country; when it involves many countries and these are clearly stated write here: the name of all the countries separating them with a coma (,); when it is a group of countries</p>	Main	Free Text

	<p>acting together through an international entity like the EU, write here: Regional Entity, (coma) the name of the entity (for example EU); when it is about a whole region, write here: Region, (coma) thee name of the region (for example MENA); when it is about a whole continent, write here: Continent, (coma), the name of the continent (for example Africa); when it is a denominated group of countries, write here the name of that denomination of group of countries (for example WASCAL).</p>		
Notes	<p>Explanation: At the beginning of the category columns of all tabs there is a column named "Notes".</p> <p>Collection/fill-in instruction: This column serves to write personal notes that justify and/or explain how the categorization of that intervention was made, i.e. the criteria that were followed, or keywords and/or sentences that explain why an intervention fits certain (or doesn't fit) categories.</p>	Main	Free Text

Categorization/ Coding Definitions and Instructions

Concept/ Column	Tab	Definition and Explanation, Coding Instructions	Type of Text
Production (General)	Policy Instruments - Tech/Sector	<p>Definition and Explanation: Production refers to the production of hydrogen through different processes. This data collection focuses on the following three processes: electrolysis, steam methane reforming (SMR) with carbon capture and storage (CCS), and methane pyrolysis.</p> <p>Coding Instruction: If an intervention is a policy instrument that addresses or directly affects the production of hydrogen, write “Yes”; if the intervention is a policy instrument that does not address or directly affect the production of hydrogen write “No”.</p>	Yes/No
Production Unspecified	Policy Instruments - Tech/Sector	<p>Definition and Explanation: Production refers to the production of hydrogen through different processes. This data collection focuses on the following three processes: electrolysis, steam methane reforming (SMR) with carbon capture and storage (CCS), and methane pyrolysis.</p> <p>Coding Instruction: Write “Yes” if the intervention is a policy instrument that addresses or directly affects the production of hydrogen but does not explicitly specify the hydrogen production process; if the intervention does specify an explicit hydrogen production process (i.e. electrolysis, or SMR with CCS, or methane pyrolysis), write “No”.</p> <p><u>Important:</u> The user should leave in blank this cell if she did not go through the intervention deep enough to determine if this one is specific or not (for example if the intervention is too long and there was not enough time to read it all, or there was not enough information of the intervention found).</p>	Yes/No/ Blank
Production - Steam Methane Reforming with CCS	Policy Instruments - Tech/Sector	<p>Definition and Explanation: This subcategory of Production refers to the hydrogen production process called Steam Methane Reforming (SMR) with CCS. SMR is the hydrogen production process that involves mixing methane with steam, followed by heating the resulting mix in the company of a chemical reactor known as methane reformer; this reaction produces hydrogen and carbon monoxide, later on the carbon monoxide is captured and stored (CCS).</p> <p>Coding Instruction: If the intervention is a policy instrument that addresses or directly affects the production of hydrogen through SMR with CCS, write “Yes”, if the intervention is a policy instrument that does not address or directly affect the production of hydrogen through SMR with CCS, write “No”.</p>	Yes/No
Production-Electrolysis (General)	Policy Instruments - Tech/Sector	<p>Definition and Explanation: This subcategory of Production refers to the hydrogen production process called electrolysis. Electrolysis is the process where water is split using electricity to obtain hydrogen and oxygen.</p> <p>Coding Instruction: If the intervention is a policy instrument that addresses or directly affects the production of hydrogen through Electrolysis, write “Yes”; if it is a policy instrument that does not address or directly affect the production of hydrogen through Electrolysis, write “No”.</p>	Yes/No

Production-Methane Pyrolysis	Policy Instruments - Tech/Sector	<p>Definition and Explanation: This subcategory of production refers to the hydrogen production process called Methane Pyrolysis. In this process, methane is split by flowing into a reactor that is heated with renewable energy sources into hydrogen in gaseous form and fixed carbon in solid form. This process enables hydrogen to be produced from methane (CH₄) (natural gas and biogas).</p> <p>Coding Instruction: If the intervention is a policy instrument that addresses or directly affects the production of hydrogen through methane pyrolysis, write “Yes”; if it is a policy instrument that does not address or directly affect the production of hydrogen through methane pyrolysis, write “No”.</p>	Yes/No
Production of hydrogen derivatives	Policy Instruments - Tech/Sector	<p>Definition and Explanation: hydrogen derivative products within the meaning of this codebook are gaseous or liquid energy carriers based on Hydrogen, these include methane, ammonia, methanol, petrol, diesel, kerosene, among others. “PtX is the process of converting renewable electricity, from wind and sun, but also from hydro or geo-thermal power plants, into a wide variety (X) of end products. It starts with producing hydrogen in electrolyzers using renewable electricity to split water (H₂O) into its components hydrogen (H₂) and oxygen (O₂). These elements can then either be used directly or can be processed further in PtX synthesis units” (PtX Hub, 2022). Thus, the category “Production of derived products/ Power-to-X” refers to the production of hydrogen derivative products as defined above.</p> <p>Coding Instruction: If the intervention addresses or directly affects the production of hydrogen derived products, write “Yes”; if the intervention does not address or directly affect the production of hydrogen derived products, write “No”. <u>Important note:</u> liquid organic hydrogen carriers (LOHCs), ammonia (NH₃), methanol (CH₃OH), can also be used as hydrogen storage and transport mediums. In the context of this category, only Policy Objectives that address or directly affect the production of hydrogen derived products are to be coded with “Yes”, if the intervention only mentions these in the use of them as storage or transport mediums, they are to be coded with “No” in this category.</p>	Yes/No
Application/Use/Usage Sector General	Policy Instruments - Tech/Sector	<p>Definition and Explanation: the application/ use refer to those hydrogen related activities where hydrogen is used. Thus, this category is oriented towards the different uses of hydrogen, in different sectors. Hydrogen can be used in the industry, in transport/mobility, heat and power production. In this way, the hydrogen usage sectors are industry, transport/mobility, heat and power Production.</p> <p>Coding Instruction: If the intervention does not address or directly affect hydrogen applications/ uses and/or application/usage sectors, write “No”.</p>	Yes/No
Application/Use /Usage Sector Unspecified	Policy Instruments - Tech/Sector	<p>Definition and Explanation: the application/ use refer to those hydrogen related activities where hydrogen is used. Thus, this category is oriented towards the different uses of hydrogen, in different sectors. Hydrogen can be used in the industry, in transport/mobility, heat and power production. In this way, the hydrogen usage sectors are industry, transport/mobility, heat and power Production.</p> <p>Coding Instruction: According to the explanation above, write “Yes” if the intervention is a Policy Instrument that addresses or directly affects the use of hydrogen but does not specify the hydrogen application use/usage and or sector; if the</p>	Yes/No/Blank

		<p>intervention does specify an explicit hydrogen use/usage and/or application sector, write “No”.</p> <p><u>Important:</u> the user should leave in blank this cell if she did not go through the intervention deep enough to determine if this one is specific or not (for example if the intervention is too long and there was not enough time to read it all, or there was not enough information of the intervention found).</p>	
Application/Use/Usage Sector - Industry (General)	Policy Instruments - Tech/Sector	<p>Definition and Explanation: the industry sector is one of the focal end uses of hydrogen, mainly in the Steel, Chemical and Cement Industries, as well as in refineries, i.e. ammonia production, methanol production, steel production, oil refining, among others.</p> <p>Coding Instruction: If the intervention is a policy instrument, that addresses or directly affects hydrogen application uses/usage/sector in the industry, write “Yes”; if it is a policy instrument that does not address or directly affect the hydrogen application uses/usages/sector in the industry, write “No”.</p>	Yes/No
Application/Use/Usage Sector - Transport/Mobility (General)	Policy Instruments - Tech/Sector	<p>Definition and Explanation: hydrogen can be used in the transport sector in shipping, aviation, cars, rails, trucks and buses through fuel cells and as alternative fuel (with adapted internal combustion engines).</p> <p>Coding Instruction: If the intervention is a policy instrument that addresses or directly affects hydrogen application uses/usages on transport/mobility or transport/mobility as a hydrogen application sector, write “Yes”; if it is a policy instrument that does not address or directly affect hydrogen application uses/usages on transport/mobility or transport/mobility as a hydrogen application sector, write “No”.</p> <p><u>Important:</u> For the purposes of this database, unless expressed explicitly otherwise, when an intervention is directed towards vehicles/conventional vehicles, these comprise: automobile, bus, and trucks.</p>	Yes/No
Application/Use/Usage Sector - Heat (General)	Policy Instruments - Tech/Sector	<p>Definition and Explanation: hydrogen can be used in heating as a substitute for fossil fuels, it can be used for power and also be blended with another source of heating power (i.e. natural gas); longer term potentials for hydrogen in this sector may include a direct use of hydrogen in hydrogen boilers or fuel cells. Hydrogen can also be used in Combined Heat and Power (CHP) systems: hydrogen CHP systems can convert the gas back to electricity and heat (or cold) in an efficient way.</p> <p>Coding Instruction: If the intervention is a policy instrument that addresses or directly affects hydrogen application uses/usages on heat or heat as a hydrogen application sector, write “Yes”; if it is a policy instrument that does not address or directly affect hydrogen application uses/usages on heat or heat as a hydrogen application sector, write “No”.</p>	Yes/No
Application/Use/Usage Sector - Power Generation (General)	Policy Instruments - Tech/Sector	<p>Definition and Explanation: hydrogen can be used in power generation for storing renewable energy. Additionally, hydrogen and ammonia can be harnessed in gas turbines to increase the flexibility of the power system.</p> <p>Coding Instruction: If the intervention is a policy instrument that addresses or directly affects hydrogen application uses/usages on power generation or power generation as a hydrogen application sector, write “Yes”; if it is a policy instrument that does not address or directly affect hydrogen application uses/usages on power generation or power generation as a hydrogen application sector, write “No”.</p>	Yes/No

<p>Transport and Storage Infrastructure (General)</p>	<p>Policy Instruments - Tech/Sector</p>	<p>Definition and Explanation: in this definition, transport is referred to the mode of transporting hydrogen. Hydrogen needs to be stored first to be able to be transported. There exist two ways of storing hydrogen that can be divided into 1) physical methods and 2) material-based methods. 1) Hydrogen Physical storage methods include: compressed gaseous hydrogen (CGH₂) and liquified hydrogen (LH₂); 2) Hydrogen Material-based storage methods include: liquid organic hydrogen carriers (LOHCs), ammonia (NH₃), methanol (CH₃OH), and metal hydrides. Hydrogen can be transported through 3 main means: road (trucks and trains), maritime (ships), and pipeline. Hydrogen can be transported via road in both a gaseous (using pressure tanks) and a liquid state (using cryo tanks); ammonia, methanol and hydrogen loaded LOHCs are also able to be transported using mobile vessels. <u>Hydrogen derivatives</u> can be transported via maritime (ships), through different ways: LOHCs, ammonia and methanol in tankers. Currently, <u>hydrogen in its pure state</u> is not transported via maritime on a large scale, but the first tanker created for the transport of liquid hydrogen was successfully built in 2020. Hydrogen can be transported via pipeline in a gaseous state. In addition to the creation of new pipelines, existing natural gas pipelines can be repurposed so hydrogen can be transported through those same pipelines.</p> <p>Coding Instruction: If the intervention is a policy instrument that addresses or directly affects transport and/or storage of hydrogen in any of its forms, write “Yes”; if it is a policy instrument that does not address or directly affect transport and/or storage of hydrogen in any of its forms, write “No”.</p> <p><u>Important note:</u> liquid organic hydrogen carriers (LOHCs), ammonia (NH₃), methanol (CH₃OH), can also be considered hydrogen-derived products. In the contexts of this category, only Policy Objectives/Policy Instruments that include these as a storage or transport medium of hydrogen are to be coded with “Yes” in these sections, if the intervention only mentions these as derived products of hydrogen, i.e. as production of derived products/Power-to-X, they are to be coded with “No” in this category.</p>	<p>Yes/No</p>
<p>Multiple</p>	<p>Policy Instruments - Tech/Sector; Policy Instruments - Type</p>	<p>Definition and Explanation: this subcategory was included to mark those interventions that touch different categories and/or subcategories. Special instructions for it will follow as there are different levels i.e. categories of where Multiple should be coded with Yes. In this case we are referring to Multiple at the first/top level (for more reference on the levels, see images of the categories and the instructions for “Multiple” on levels 2, 3 and 4 (only on Policy Instruments).</p> <p>Coding Instruction: <u>When coding Policy Instruments-Tech Sector:</u> if the intervention is a Policy Instrument that touches on two or more of the general categories (level 1, horizontally) i.e. Production General, Usage General, Transport and Storage General, you will mark this column with “Yes”. It is important to note the LEVEL i.e. you will mark this column with “Yes”, if the multiplicity presents itself in the BIG categories (level 1, horizontally), if the multiplicity presents itself only in the levels 2/3/4 you won't mark this column with “Yes”.</p> <p><u>When coding Policy Instrument Types:</u> unlike Policy Instruments by Sector, for Instrument Types we will not have a “Multiple” category for building graphs. However, the Multiple in the database is maintained for SPECIFIC cases where there will be a “Multiple” at this level (will be explained in short), as well as for having it to control/correction. Nevertheless, “Multiple” in instrument Types should be avoided, even more strictly as in Instruments by Sector. The only case where there will be Multiple at level 1 (horizontally), is when an intervention touches on International and another big category (level 1).</p>	<p>Yes/No</p>

		<ul style="list-style-type: none"> • For this the column “International Initiatives TAG” was added; this column will be marked with “Yes” when an intervention touches on both international Initiatives and another of the big categories (level 1, horizontally). For avoiding the “multiplicity” in the rest of the categories, the following criteria has been set: • International Initiatives TAG; this column will be marked with “Yes” when an intervention touches on both international Initiatives and another of the big categories (level 1, horizontally) ; this means that for these cases, both columns of those (International and another level 1 category) two big categories (categories at the level 1, horizontally) will be marked with “Yes”; for example, Germany and Australia have a research program called HyGate, this program is focused on Research (for the development of the supply chain, but the MAIN FOCUS is R&D (criteria for this will follow) but it is also international, as it is an international cooperation agreement within two countries, in this case, R&D Promotion will be marked with “Yes”, and the International TAG will be marked with “Yes”. • Overlapping cases: (almost only happens between the other level 1 categories (horizontally) and R&D, and the other level 1 categories and International, therefore specific criteria has been set for those). <p>Criteria for overlapping in R&D:</p> <ul style="list-style-type: none"> • R&D vs. Economy-Wide instrument: it cannot happen that an instrument is both R&D and Economy-Wide, either the instrument entails two different actions and has to be split, or its main focus is either-or (based on the information you have of that intervention, determine what its main focus is and mark that one with “Yes”) • R&D VS. Investment Promotion: it cannot happen that an instrument is both R&D and Investment promotion; it is important to determine the main focus of the intervention, which means differentiating between the sector it impacts and the main focus of the intervention. This happens mostly in R&D, for example, an R&D program focused on developing electrolyzer technology: this intervention will only be marked on R&D because the main focus of the instrument is R&D regardless of what sector is targeting. This is also why Promotion of Production, Usage and Transport and Storage fall under one same umbrella, Investment Promotion (will be explained later), because only those instruments that impact directly i.e. give specific aid/support to the production or hydrogen, or its usage, or its transport and/or transport infrastructure. • R&D vs Education and Information: it cannot happen that an instrument is both R&D and Education and Information, either the instrument entails two different actions and has to be split or its main focus is either-or • R&D vs Voluntary Agreements: Voluntary agreements override R&D, while it can be rare that a Voluntary Agreement entails also R&D, it is possible, in this case, the intervention will be marked with “Yes” only on Voluntary Agreement and not on R&D • R&D vs Network Cluster Promotion: it can happen often that interventions targeting the development 	
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		<p>of clusters entail also R&D, in this case, Network/Cluster Promotion overrides R&D, meaning that the intervention will only be marked with “Yes” on Network Cluster Promotion</p> <ul style="list-style-type: none"> R&D vs. International: when an intervention is an R&D instrument that has an international component, this intervention will be marked with “Yes” on R&D and on International Initiatives TAG <p>Criteria on overlapping with International: as mentioned above, the only category where there can be multiple is in International but this needs to be marked in both the other big category and on International Initiatives TAG. In possible overlapping:</p> <ul style="list-style-type: none"> International initiatives vs. Economy-wide: very rare if it happens, but if it does: the intervention is marked with “Yes” on Economy-Wide and International Intervention TAG International Initiatives vs. R&D- In this case the intervention is marked with “Yes” in R&D and International Initiatives TAG International Initiatives vs. Investment Promotion: while it can happen that an intervention is both of these, before marking it in Investment Promotion and International Intervention TAG this additional criteria must be followed: if an intervention is international with a specific action i.e. funding a production plant, or a usage program, etc. if the money is given/invested in that other foreign country, International Initiative overrules Investment Promotion and that intervention is only marked with “Yes” on International Intervention, and International Intervention TAG; if an intervention is an MoU, an International Partnership, or alike, International overrides and this intervention is only marked with yes on International Intervention, and International Intervention TAG. 	
Policy Instruments- Tech/Sector	Policy Instruments - Tech/Sector	<p>Definition and Explanation: Policy instruments are the methods used by the government and/or public entities to promote certain actions to achieve a defined set of objectives. In other words, policy instruments are the connection between policy formulation and policy implementation. In this category, the policy instruments are categorized by technology/ sector. For an intervention to be considered a Policy Instrument, it must be stated and/or it should be a part of an Official document, that include an action or set of actions making that intervention an instrument. For example, if an intervention and/or a statement only states the need or the desire to attain something or to do something but is not accompanied by an instrument, the intervention cannot be considered a policy instrument.</p> <p>Coding Instruction: Based on the explanation above, if an intervention meets the definition of a Policy Instrument, write “Yes” in this column and continue coding the following subcategories, if the intervention does not meet the definition to be a Policy Instrument, write “No” in this column and in the other subcategories in this tab.</p>	Yes/No
Production General	Policy Instruments - Tech/Sector	<p>Definition and Explanation: Production General comprehends Production (of hydrogen) as well as Production of Derived Products/PtX.</p> <p>Coding Instruction: mark this column with “Yes” if an intervention is a Policy Instrument that impacts on Production of Hydrogen and/or Production of Derived Products.</p>	Yes/No

Production - Electrolysis - Unspecified	Policy Instruments - Tech/Sector	<p>Definition and Explanation: Electrolysis is the process where water is split using electricity to obtain hydrogen and oxygen, this reaction is carried out using an electrolyser. Electrolysers can vary in the electrolyte material and the operating temperature; the latter results in diverse types of electrolysers that differentiate mainly through the distinctive type of electrolyte material involved and the ionic types it conducts. In this way, there are 3 main different types of electrolysers: Polymer Electrolyte Membrane/Proton Exchange Membrane (PEM), Alkaline (Alkali), and Solid Oxide Electrolysers (SOEC).</p> <p>Coding Instruction: According to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the production of hydrogen via electrolysis but does not specify the electrolyser type or does not impact a specific electrolyser type, write “Yes”; if the intervention does specify an explicit electrolyser type and/or impacts on a specific electrolyser type, write “No”.</p> <p><u>Important note:</u> leave in blank this cell if there wasn’t an enough assessment of the intervention to determine if this one is specific or not (for example if the intervention is too long and there was not enough time to read it all, or there was not enough information of the intervention found).</p>	Yes/No
Production - Electrolysis - PEM - General	Policy Instruments - Tech/Sector	<p>Definition and Explanation: Electrolysers can vary in the electrolyte material and the operating temperature; the latter results in diverse types of electrolysers that differentiate mainly through the distinctive type of electrolyte material involved and the ionic types it conducts. The Polymer Electrolyte Membrane/Proton Exchange Membrane (PEM) Electrolyser is one where the electrolyte is a solid plastic material. In this electrolyser, the electrons flow through an exterior circuit and the hydrogen ions move across the Proton Exchange Membrane to the cathode, at the cathode, hydrogen ions combine with the electrons from the exterior circuit resulting in hydrogen gas.</p> <p>Coding Instruction: According to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects PEM electrolysis, write “Yes”; if the intervention is a Policy Instrument that does not address or directly affect PEM electrolysis, write “No”.</p>	Yes/No
Production - Electrolysis - PEM - Unspecified	Policy Instruments - Tech/Sector	<p>Definition and Explanation: Electrolysers can vary in the electrolyte material and the operating temperature; the latter results in diverse types of electrolysers that differentiate mainly through the distinctive type of electrolyte material involved and the ionic types it conducts. The PEM Polymer Electrolyte Membrane/Proton Exchange Membrane (PEM) Electrolyser is one where the electrolyte is a solid plastic material. In this electrolyser, the electrons flow through an exterior circuit and the hydrogen ions move across the Proton Exchange Membrane to the cathode, at the cathode, hydrogen ions combine with the electrons from the exterior circuit resulting in hydrogen gas. According to varied requirements, PEM electrolysers can have variations on its design.</p> <p>Coding Instruction: According to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects PEM electrolysis and/or PEM electrolyser technology but does not explicitly mention, a design specific PEM electrolyser technology, write “Yes”; if the intervention is a Policy Instrument that addresses or directly affects a design specific PEM electrolysis and/or PEM electrolyser technology, write “No”.</p>	Yes/No
Production - Electrolysis - PEM - Design Specific	Policy Instruments - Tech/Sector	<p>Definition and Explanation: Electrolysers can vary in the electrolyte material and the operating temperature; the latter results in diverse types of electrolysers that differentiate mainly</p>	Yes/No

		<p>through the distinctive type of electrolyte material involved and the ionic types it conducts. The Polymer Electrolyte Membrane/Proton Exchange Membrane (PEM) Electrolyser is one where the electrolyte is a solid plastic material. In this electrolyser, the electrons flow through an exterior circuit and the hydrogen ions move across the Proton Exchange Membrane to the cathode, at the cathode, hydrogen ions combine with the electrons from the exterior circuit resulting in hydrogen gas. According to varied requirements, PEM electrolysers can have variations on its design.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects PEM electrolysis and/or PEM electrolyser technology that is design specific, i.e. oriented towards a specific design of the PEM electrolyser and/or the PEM electrolysis technology, write “Yes” ; if the intervention is a Policy Instrument that addresses or directly affects PEM electrolysis and/or PEM electrolyser technology but is not design specific (it is rather general for PEM electrolysis), write “No”.</p>	
Production - Electrolysis - Alkali - General	Policy Instruments - Tech/Sector	<p>Definition and Explanation: Electrolysers can vary in the electrolyte material and the operating temperature; the latter results in diverse types of electrolysers that differentiate mainly through the distinctive type of electrolyte material involved and the ionic types it conducts. The Alkaline (Alkali) Electrolysers are the ones that use a liquid alkaline solution of sodium or potassium hydroxide as the electrolyte, these operate by transporting hydrogen ions through the electrolyte from the cathode to the anode, generating hydrogen on the cathode side.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects, Alkaline electrolysis and/or Alkaline electrolyser technology, write “Yes”; if the intervention is a Policy Instrument that does not address or directly affect Alkaline electrolysis and/or Alkaline electrolyser technology, write “No”.</p>	Yes/No
Production - Electrolysis - Alkali - Unspecified	Policy Instruments - Tech/Sector	<p>Definition and Explanation: Electrolysers can vary in the electrolyte material and the operating temperature; the latter results in diverse types of electrolysers that differentiate mainly through the distinctive type of electrolyte material involved and the ionic types it conducts. The Alkaline (Alkali) Electrolysers are the ones that use a liquid alkaline solution of sodium or potassium hydroxide as the electrolyte, these operate by transporting hydrogen ions through the electrolyte from the cathode to the anode, generating hydrogen on the cathode side.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects Alkaline electrolysis and/or Alkaline electrolyser technology but does not explicitly mention, a design specific Alkaline electrolyser technology, write “Yes”; if the intervention is a Policy Instrument that addresses or directly affects Alkaline electrolysis and/or Alkaline electrolyser technology but it is design specific, write “No”.</p>	Yes/No
Production - Electrolysis - Alkali - Design Specific	Policy Instruments - Tech/Sector	<p>Definition and Explanation: Electrolysers can vary in the electrolyte material and the operating temperature; the latter results in diverse types of electrolysers that differentiate mainly through the distinctive type of electrolyte material involved and the ionic types it conducts. The Alkaline (Alkali) Electrolysers are the ones that use a liquid alkaline solution of sodium or potassium hydroxide as the electrolyte, these operate by transporting hydrogen ions through the electrolyte from the cathode to the anode, generating hydrogen on the cathode side.</p>	Yes/No

		<p>Coding Instruction: according to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects Alkaline electrolysis and/or Alkaline electrolyser technology that is design specific, i.e. oriented towards a specific design of the Alkaline electrolyser and/or the Alkaline electrolysis technology, write “Yes” ; if the intervention is a Policy Instrument that addresses or directly affects Alkaline electrolysis and/or Alkaline electrolyser technology but is not design specific (it is rather general for Alkaline electrolysis), write “No”.</p>	
Production - Electrolysis - SOEC - General	Policy Instruments - Tech/Sector	<p>Definition and Explanation: Electrolysers can vary in the electrolyte material and the operating temperature; the latter results in diverse types of electrolysers that differentiate mainly through the distinctive type of electrolyte material involved and the ionic types it conducts. The Solid Oxide Electrolysers (SOEC) are the ones that use a solid ceramic material as the electrolyte, selectively conducting negatively charged oxygen ions at high temperatures. Thus, generating hydrogen in a different manner: they need to operate at much higher temperatures than PEM and Alkali electrolysers.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects SOEC electrolysis and/or SOEC electrolyser technology, write “Yes”; if the intervention is a Policy Instrument that does not address or directly affect SOEC electrolysis and/or SOEC electrolyser technology, write “No”.</p>	Yes/No
Production - Electrolysis - SOEC - Unspecified	Policy Instruments - Tech/Sector	<p>Definition and Explanation: Electrolysers can vary in the electrolyte material and the operating temperature; the latter results in diverse types of electrolysers that differentiate mainly through the distinctive type of electrolyte material involved and the ionic types it conducts. The Solid Oxide Electrolysers (SOEC) are the ones that use a solid ceramic material as the electrolyte, selectively conducting negatively charged oxygen ions at high temperatures. Thus, generating hydrogen in a different manner: they need to operate at much higher temperatures than PEM and Alkali electrolysers.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects SOEC electrolysis and/or SOEC electrolyser technology but does not explicitly mention, a design specific SOEC electrolyser technology, write “Yes”; if the intervention is a Policy Instrument that is addresses or directly affects SOEC electrolysis and/or SOEC electrolyser technology but it is design specific, write “No”.</p>	Yes/No
Production - Electrolysis - SOEC - Design Specific	Policy Instruments - Tech/Sector	<p>Definition and Explanation: Electrolysers can vary in the electrolyte material and the operating temperature; the latter results in diverse types of electrolysers that differentiate mainly through the distinctive type of electrolyte material involved and the ionic types it conducts. The Solid Oxide Electrolysers (SOEC) are the ones that use a solid ceramic material as the electrolyte, selectively conducting negatively charged oxygen ions at high temperatures. Thus, generating hydrogen in a different manner: they need to operate at much higher temperatures than PEM and Alkali electrolysers.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects SOEC electrolysis and/or SOEC electrolyser technology that is design specific, i.e. oriented towards a specific design of the SOEC electrolyser and/or the SOEC electrolysis technology, write “Yes” ; if the intervention is a Policy Instrument that is addresses or directly affects SOEC electrolysis and/or SOEC</p>	Yes/No

		electrolyser technology but it is not design specific (it is rather general for SOEC electrolysis), write “No”.	
Production of Hydrogen Derivatives - Unspecified	Policy Instruments - Tech/Sector	<p>Definition and Explanation: hydrogen derivate products within the meaning of this codebook are gaseous or liquid energy carriers based on Hydrogen, these include methane, ammonia, methanol, petrol, diesel, kerosene, among others. “PtX is the process of converting renewable electricity, from wind and sun, but also from hydro or geo-thermal power plants, into a wide variety (X) of end products. It starts with producing hydrogen in electrolyzers using renewable electricity to split water (H₂O) into its components hydrogen (H₂) and oxygen (O₂). These elements can then either be used directly or can be processed further in PtX synthesis units” (PtX Hub, 2022). Thus, the category “Production of derived products/Power-to-X” refers to the production of hydrogen derivate products as defined above.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects Production of derived products/Power-to-X, but does not explicitly mention a specific one of them, write “Yes”; if the intervention is a Policy Instrument that addresses or directly affects the Production of derived products/Power-to-X but it is specific to only one or a few of them and not all of them in general, write “No”.</p> <p><u>Important note:</u> liquid organic hydrogen carriers (LOHCs), ammonia (NH₃), methanol (CH₃OH), can also be used as hydrogen storage and transport mediums. In the contexts of this category, only Policy Instruments that include the production of hydrogen derived products or are focused on the production of hydrogen derived products are to be coded with “Yes”, if the intervention only mentions these in the use of them as storage or transport mediums, they are to be coded with “No” in this category.</p>	Yes/No
Production of Hydrogen Derivatives - Methanol	Policy Instruments - Tech/Sector	<p>Definition and Explanation: hydrogen derivate products within the meaning of this codebook are gaseous or liquid energy carriers based on Hydrogen. Methanol is an organic compound that belongs to the alcohol family, as hydrogen is used to produce methanol, it is therefore a hydrogen derived product. Methanol is used in the chemical, construction, and plastic industries, and as a fuel or fuel additive. Additionally, like mentioned in the Transport and Storage Infrastructure subcategories, methanol can also be used as an organic carrier for storing electricity produced from renewable sources or as a transportation fuel, in this way it is also considered a material-based storage method for hydrogen.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the production of methanol as a hydrogen derived product, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affect the production of methanol as a hydrogen derived product, write “No”.</p> <p><u>Important note:</u> Methanol (CH₃OH), can also be used as hydrogen storage medium. In the context of this category, only Policy Instruments that include the production of methanol as a hydrogen derived product or are focused on the production of methanol as a hydrogen derived product are to be coded with “Yes”, if the intervention only mentions it in the use of it as storage medium, it is to be coded with “No” in this category.</p>	Yes/No
Production of Hydrogen Derivatives - Synthetic Fuels	Policy Instruments - Tech/Sector	<p>Definition and Explanation: hydrogen derivate products within the meaning of this codebook are gaseous or liquid energy carriers based on Hydrogen. Fischer Tropsch synthesis is a</p>	Yes/No

		<p>catalytic chemical process to produce liquid transportation hydrocarbon fuels and other chemical products derived from syngas (a mixture of hydrogen (H₂) and carbon monoxide (CO) that can be obtained from virtually any carbon-rich feedstock like coal, natural gas or biomass).</p> <p>Coding Instruction: based on the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the production of hydrogen derived products via Fischer Tropsch Synthesis, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affect the production of hydrogen derived products via Fischer Tropsch Synthesis, write “No”.</p>	
Production of Hydrogen Derivatives - LOHC	Policy Instruments - Tech/Sector	<p>Definition and Explanation: hydrogen derivate products within the meaning of this codebook are gaseous or liquid energy carriers based on Hydrogen. Liquid Organic Hydrogen Carriers (LOHC) are “organic substances in liquid or semi-solid states that store hydrogen by catalytic hydrogenation and dehydrogenation processes over multiple cycles” (Chandra & Yoon, 2020, p.1). Like mentioned in previous categories, LOHCS are also one of the Hydrogen Material-based storage methods.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the production of LOHCs, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affect the production of LOHCs, write “No”.</p> <p><u>Important note:</u> LOHCs can also be used as hydrogen storage medium. In the context of this category, only Policy Instruments that include the production of LOHCs as a hydrogen derived product or are focused on the production of LOHCs as a hydrogen derived product are to be coded with “Yes”, if the intervention only mentions it in the use of it as storage medium, it is to be coded with “No” in this category.</p>	Yes/No
Production of Hydrogen Derivatives - Ammonia	Policy Instruments - Tech/Sector	<p>Definition and Explanation: Ammonia (NH₃), is a chemical compound composed of nitrogen and hydrogen. In addition to being a hydrogen derivate product, ammonia can be used as hydrogen transport and storage medium through a conversion process. Ammonia is an important component in the industry, for fertilizer production, as a refrigerant gas, for the manufacture of plastics and textiles, among others.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the production of Ammonia, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affect the production of Ammonia, write “No”. <u>Important note:</u> Ammonia can also be used as hydrogen storage and transport medium. In the context of this category, only Policy Instruments that include the production of Ammonia as a hydrogen derived product or are focused on the production of Ammonia as a hydrogen derived product are to be coded with “Yes”, if the intervention only mentions it in the use of it as storage and/or transport medium, it is to be coded with “No” in this category.</p>	Yes/No
Production of Hydrogen Derivatives - Other	Policy Instruments - Tech/Sector	<p>Definition and Explanation: hydrogen derivate products within the meaning of this codebook are gaseous or liquid energy carriers based on Hydrogen.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the production of hydrogen derived products that do not match the definition of any of the other subcategories of</p>	Yes/No

		<p>"Production of Derived Products/Power-To-X", write "Yes", if the intervention is a Policy Instrument that addresses or directly affects the production of hydrogen derived products but it matches the definition of one (or many) of the other subcategories of "Production of Derived Products/Power-To-X", write "No" in this column.</p>	
Usage - General	Policy Instruments - Tech/Sector	<p>Definition and Explanation: hydrogen can be used in many different sectors such as the steel, chemical and cement industries, in the transport sector, in the heating sector, among others, for its usage many technologies can be harnessed and other are being developed. Tis general category of usage encompasses both the technologies for harnessing hydrogen as well as the sectors where it can be harnessed that are covered in this database. In this way, this category is divided into Usage by Technology and Usage by Sector.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the usage of hydrogen with regards to the technology and /or the sector, write "Yes" in this column , if the intervention is not a policy instrument and/or does not directly affect the usage of hydrogen, write "No" in this column. <u>Important note here:</u> in Usage it is not the same as in Production: in Production General we are including two different things: the production of hydrogen and the production of derived products, in Usage, we are coding the same thing but in different ways i.e. coding it by the Technology and by Sector; this disclaimer will be important to have in mind when coding the different levels of multiple (instructions of this are found in the annex).</p>	Yes/No
Usage Technology General	Policy Instruments - Tech/Sector	<p>Definition and Explanation: hydrogen can be transformed to be used to power homes and industries by way of being transformed to methane and electricity, it can also be used to power cars, trucks, ships and planes by way of being transformed into fuels. These hydrogen end-uses require a technology component for the transformation of hydrogen for its end-use.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a Policy Instrument that addresses or directly affects hydrogen end-use technologies, write "Yes", if the intervention is a Policy Instrument that does not address or directly affects hydrogen end-use technologies, write "No".</p>	Yes/No
Usage Technology Unspecified	Policy Instruments - Tech/Sector	<p>Definition and Explanation: hydrogen can be transformed to be used to power homes and industries by way of being transformed to methane and electricity, it can also be used to power cars, trucks, ships and planes by way of being transformed into fuels. These hydrogen end-uses require a technology component for the transformation of hydrogen for its end-use.</p> <p>Coding Instruction: According to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects technologies for hydrogen end-use but does not specify one or several in particular (i.e. it is rather ambiguous), write "Yes"; if the intervention does specify an explicit hydrogen end-use technology, write "No". Leave in blank this cell if there wasn't an enough assessment of the intervention to determine if this one is specific or not (for example if the intervention is too long and there was not enough time to read it all, or there was not enough information of the intervention found).</p>	Yes/No
Usage Technology Fuel Cells	Policy Instruments - Tech/Sector	<p>Definition and Explanation: hydrogen can be transformed to be used to power homes and industries by way of being transformed to methane and electricity, it can also be used to</p>	Yes/No

		<p>power cars, trucks, ships and planes by way of being transformed into fuels. These hydrogen end-uses require a technology component for the transformation of hydrogen for its end-use. Fuel Cells are devices that produce electricity through electrochemical reaction instead of through combustion. In fuel cells, hydrogen and oxygen are combined generating electricity, heat and water. In this way, fuel cells can be used in stationary purposes like centralized power generation or in distributed purposes like fuel cell electric vehicles.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a Policy Instrument that addresses or directly affects fuel cells as a hydrogen usage technology, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affect fuel cells as a hydrogen usage technology, write “No”.</p>	
Usage Technology-Other	Policy Instruments - Tech/Sector	<p>Definition and Explanation: hydrogen can be transformed to be used to power homes and industries by way of being transformed to methane and electricity, it can also be used to power cars, trucks, ships and planes by way of being transformed into fuels. These hydrogen end-uses require a technology component for the transformation of hydrogen for its end-use. An alternative technology to fuel cells are modified internal combustion engines that can run on pure hydrogen, allowing the usage of hydrogen in the transport sector as a fuel alternative.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a Policy Instrument that addresses or directly affects a hydrogen usage technology other than fuel cells, write “Yes”, if the intervention is a Policy Instrument that does not address or directly hydrogen usage technologies or it is specific for fuel cells, write “No”.</p>	
Usage Sector Transport/Mobility Unspecified	Policy Instruments - Tech/Sector	<p>Definition and Explanation: hydrogen can be used in the transport sector in shipping, aviation, cars, rails, trucks and buses through fuel cells and thorough adapted hydrogen combustion engines as synthetic fuel.</p> <p>Coding Instruction: According to the explanation above write “Yes” if the Policy Instrument addresses or directly affects Transport/Mobility usage and/or as a hydrogen usage sector and it does not specify the transport/mobility mean where hydrogen is used; if the intervention does specify an explicit transport/mobility mean or means, i.e. aviation, shipping, and/or road, write “No”.</p> <p>Important: the user should leave in blank this cell if she did not go through the intervention deep enough to determine if this one is specific or not (for example if the intervention is too long and there was not enough time to read it all, or there was not enough information of the intervention found).</p> <p>Important note: for the purposes of this database, unless expressed explicitly otherwise, when an intervention is directed towards vehicles/conventional vehicles, these comprise: automobile, bus, and trucks.</p>	Yes/No
Usage Sector Transport/Mobility Automobile	Policy Instruments - Tech/Sector	<p>Definition and Explanation: the use of hydrogen in automobiles is focused on generating power by transforming the chemical energy of the hydrogen into mechanical energy in two main forms: i) reaction of hydrogen with oxygen in a fuel cell (Fuel Cell Electric Vehicle (FCEV)); or ii) burning hydrogen in an adapted internal combustion engine (Hydrogen Internal Combustion Engine Vehicle (HICEV)). In the FCEV, the electricity to fuel their</p>	Yes/No

		<p>motors comes from the fuel cells powered by hydrogen. In a fuel cell the production of electricity occurs in an electrochemical way spurring the reaction of hydrogen to generate electricity to power the vehicle. In the HICEV the internal combustion engine is adapted so this one can be powered by liquid hydrogen instead of gasoline as fuel, generating power through the combustion of hydrogen.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the use of hydrogen in automobiles, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affects the use of hydrogen in automobiles, write “No”. _</p> <p><u>Important note:</u> for the purposes of this database, unless expressed explicitly otherwise, when an intervention is directed towards vehicles/conventional vehicles, these comprise: automobile, bus, and trucks.</p>	
Usage Sector Transport/Mobility Bus	Policy Instruments - Tech/Sector	<p>Definition and Explanation: like in the case of automobiles, hydrogen can be used in buses by way of generating power by transforming the chemical energy of the hydrogen into mechanical energy in two main forms: i) reaction of hydrogen with oxygen in a fuel cell (Fuel Cell Electric Vehicle (FCEV)); or ii) burning hydrogen in an adapted internal combustion engine (Hydrogen Internal Combustion Engine Vehicle (HICEV). In the FCEV, the electricity to fuel their motors comes from the fuel cells powered by hydrogen. In a fuel cell the production of electricity occurs in an electrochemical way spurring the reaction of hydrogen to generate electricity to power the vehicle. In the HICEV the internal combustion engine is adapted so this one can be powered by liquid hydrogen instead of gasoline as fuel, generating power through the combustion of hydrogen</p> <p>Coding Instruction: based on the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the use of hydrogen in buses, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affect the use of hydrogen in buses, write “No”. _</p> <p><u>Important note:</u> for the purposes of this database, unless expressed explicitly otherwise, when an intervention is directed towards vehicles/conventional vehicles, these comprise: automobile, bus, and trucks.</p>	Yes/No
Usage Sector Transport/Mobility Train	Policy Instruments - Tech/Sector	<p>Definition and Explanation: like in automobiles and buses, hydrogen can be used in trains by way of generating power by transforming the chemical energy of the hydrogen into mechanical energy in two main forms: i) reaction of hydrogen with oxygen in a fuel cell, or ii) burning hydrogen in an adapted internal combustion engine (hydrogen internal combustion engine).</p> <p>Coding Instruction: according to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the use of hydrogen in trains, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affect the use of hydrogen in trains, write “No”.</p>	Yes/No
Usage Sector Transport/Mobility Trucks	Policy Instruments - Tech/Sector	<p>Definition and Explanation: like in automobiles, buses, and trains, the use of hydrogen in trucks is focused on generating power by transforming the chemical energy of the hydrogen into mechanical energy in two main forms: i) reaction of hydrogen with oxygen in a fuel cell (Fuel Cell Electric Vehicle (FCEV)); or ii) burning hydrogen in an adapted internal combustion engine (Hydrogen Internal Combustion Engine</p>	Yes/No

		<p>Vehicle (HICEV). In the FCEV, the electricity to fuel their motors comes from the fuel cells powered by hydrogen. In a fuel cell the production of electricity occurs in an electrochemical way spurring the reaction of hydrogen to generate electricity to power the vehicle. In the HICEV the internal combustion engine is adapted so this one can be powered by liquid hydrogen instead of gasoline as fuel, generating power through the combustion of hydrogen.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the use of hydrogen in trucks, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affects the use of hydrogen in trucks, write “No”.</p> <p><u>Important note:</u> for the purposes of this database, unless expressed explicitly otherwise, when an intervention is directed towards vehicles/conventional vehicles, these comprise: automobile, bus, and trucks.</p>	
Usage Sector Transport/Mobility Aviation	Policy Instruments - Tech/Sector	<p>Definition and Explanation: like in automobiles, buses, trains, and trucks, in aviation, hydrogen can be used by way of harnessing it to power aircraft thrust (hydrogen combustion: hydrogen is used as fuel through the combustion of hydrogen in an adapted engine), or by using fuel cells where the electricity to fuel the engine comes from the fuel cells powered by hydrogen.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the use of hydrogen in in aviation, write “Yes”, if the intervention is a Policy Instrument that does address or directly affects the use of hydrogen in aviation, write “No”.</p>	Yes/No
Usage Sector Transport/Mobility Maritime	Policy Instruments - Tech/Sector	<p>Definition and Explanation: like in automobiles, buses, trains, trucks, and aviation, in shipping hydrogen can be used by way of generating power by transforming the chemical energy of the hydrogen into mechanical energy in two main forms: i) reaction of hydrogen with oxygen in a fuel cell, or ii) burning hydrogen in an adapted internal combustion engine (hydrogen internal combustion engine).</p> <p>Coding Instruction: based on the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the use of hydrogen in ships, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affects the use of hydrogen in ships, write “No”.</p>	Yes/No
Usage Sector Industry Unspecified	Policy Instruments - Tech/Sector	<p>Definition and Explanation: the industry sector is one of the focal end-uses of hydrogen, mainly in the Steel, Chemical and Cement Industries, as well as in refineries, i.e. ammonia production, methanol production, steel production, oil refining, among others.</p> <p>Coding Instruction: According to the explanation above write “Yes” if the intervention is a Policy Instrument that addresses or directly affects the use of hydrogen in industry but does not specify the industry where hydrogen is used; if the intervention does specify a particular industry where hydrogen is used, write “No”.</p> <p><u>Important:</u> the user should leave in blank this cell if she did not go through the intervention deep enough to determine if this one is specific or not (for example if the intervention is too long and there was not enough time to read it all, or there was not enough information of the intervention found).</p>	Yes/No

Usage Sector Industry Steel	Policy Instruments - Tech/Sector	<p>Definition and Explanation: hydrogen can be used in the steel industry to reduce emissions in two main ways: i) as an auxiliary reducing mean in a blast furnace (H2-BF) through a basic oxygen furnace route (BF-BOF), or ii) as the sole reducing mean (H2-DRI) in a process named direct reduction of iron (DRI) through the Electric Arc Furnace (DR-EAF)</p> <p>Coding Instruction: based on the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the use of hydrogen in the steel industry, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affect the use of hydrogen in the steel industry, write “No”.</p>	Yes/No
Usage Sector Industry Chemical	Policy Instruments - Tech/Sector	<p>Definition and Explanation: hydrogen and its derivates are used in the chemical industry as fuel and as feedstock. Hydrogen is one of the core starting materials harnessed in the chemical industry. It is a key building block for the production of ammonia, and in this way fertilizers, and of methanol which is used in the production of several polymers.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the use of hydrogen in the chemical industry, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affect the use of hydrogen in the chemical industry, write “No”.</p>	Yes/No
Usage Sector Industry Cement	Policy Instruments - Tech/Sector	<p>Definition and Explanation: different to the case of steel and chemical industries, hydrogen has a limited use in the cement industry. Hydrogen use in the production of cement can be used as a substitute of fossil fuels, but it cannot be harnessed as a component or reactant in the conventional cement production.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the use of hydrogen in the cement industry, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affect the use of hydrogen in the cement industry, write “No”.</p>	Yes/No
Usage Sector Industry Other	Policy Instruments - Tech/Sector	<p>Definition and Explanation: as research on hydrogen use and applications continue, there can be additional industry applications to the ones mentioned here (Cement, Chemical, and Steel).</p> <p>Coding Instruction: according to the explanation above if the intervention is a Policy Instrument that addresses or directly affects the use of hydrogen in a specific industry different from the ones mentioned in this document (steel, chemical or cement), write “Yes”, if the intervention is a Policy Instrument that does not address or directly affects the use of hydrogen in a specific industry different to the ones already mentioned in this document (steel, chemical or cement), write “No”.</p>	Yes/No
Transport and Storage Infrastructure - Transport General	Policy Instruments - Tech/Sector	<p>Definition and Explanation: in this definition, transport is referred to the mode of transporting hydrogen. Hydrogen can be transported through 3 main means: road (trucks and trains), maritime (ships), and pipeline. Hydrogen can be transported via road in both a gaseous (using pressure tanks) and a liquid state (using cryo tanks); ammonia, methanol and hydrogen loaded LOHCs are also able to be transported using mobile vessels. Hydrogen derivatives can be transported via maritime (ships), through different ways: LOHCs, ammonia and methanol in tankers. Currently, hydrogen in its pure state is not transported via maritime on a large scale, but the first tanker created for the transport of liquid hydrogen was successfully built in 2020. Hydrogen can be transported via pipeline in a gaseous state. In addition to the creation of new pipelines, existing natural gas</p>	Yes/No

		<p>pipelines can be repurposed so hydrogen can be transported through those same pipelines.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a policy instrument that addresses or directly affects transport of hydrogen in any of its forms, write “Yes”; if the intervention is a policy instrument that does not address or directly affect transport of hydrogen in any of its forms, write “No”.</p> <p><u>Important note:</u> liquid organic hydrogen carriers (LOHCs), ammonia (NH₃), methanol (CH₃OH), can also be considered hydrogen-derived products. In the contexts of this category, only Policy Instruments that include these as a transport medium of hydrogen are to be coded with “Yes” in these sections, if the intervention only mentions these as derived products of hydrogen, i.e. as production of derived products/Power-to-X, they are to be coded with “No” in this category.</p>	
<p>Transport and Storage Infrastructure - Transport Infrastructure Unspecified</p>	<p>Policy Instruments - Tech/Sector</p>	<p>Definition and Explanation: in this definition, transport is referred to the mode of transporting hydrogen. Hydrogen can be transported through 3 main means: road (trucks and trains), maritime (ships), and pipeline. Hydrogen can be transported via road in both a gaseous (using pressure tanks) and a liquid state (using cryo tanks); ammonia, methanol and hydrogen loaded LOHCs are also able to be transported using mobile vessels. <u>Hydrogen derivatives</u> can be transported via maritime (ships), through different ways: LOHCs, ammonia and methanol in tankers. Currently, <u>hydrogen in its pure state</u> is not transported via maritime on a large scale, but the first tanker created for the transport of liquid hydrogen was successfully built in 2020. Hydrogen can be transported via pipeline in a gaseous state. In addition to the creation of new pipelines, existing natural gas pipelines can be repurposed so hydrogen can be transported through those same pipelines.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the transport of hydrogen but does not specify the transport mean, write “Yes”; if the intervention does specify an explicit hydrogen transportation mean, write “No”. <u>Important note:</u> Leave in blank this cell if there wasn’t an enough assessment of the intervention to determine if this one is specific or not (for example if the intervention is too long and there was not enough time to read it all, or there was not enough information of the intervention found).</p>	<p>Yes/No</p>
<p>Transport and Storage Infrastructure - Transport Infrastructure Pipeline</p>	<p>Policy Instruments - Tech/Sector</p>	<p>Definition and Explanation: as mentioned above, one of the hydrogen transportation means is via pipeline. Via pipeline hydrogen is transported in a gaseous state. In addition to the creation of new pipelines, existing natural gas pipelines can be repurposed so hydrogen can be transported through those same pipelines.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the transportation of hydrogen via pipeline, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affect the transportation of hydrogen via pipeline, write “No”.</p> <p><u>Important note:</u> liquid organic hydrogen carriers (LOHCs), ammonia (NH₃), methanol (CH₃OH), can also be considered hydrogen-derived products. In the contexts of this category, only Policy Objectives/Policy Instruments that include these as a transport medium of hydrogen are to be coded with “Yes” in these sections, if the intervention only mentions these as</p>	<p>Yes/No</p>

		derived products of hydrogen, i.e. as production of derived products/Power-to-X, they are to be coded with “No” in this category.	
Transport and Storage Infrastructure - Transport Infrastructure Road	Policy Instruments - Tech/Sector	<p>Definition and Explanation: as mentioned previously, hydrogen can be transported by road. Hydrogen can be transported via road in both a gaseous (using pressure tanks) and a liquid state (using cryo tanks); ammonia, methanol and hydrogen loaded LOHCs are also able to be transported using mobile vessels.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the transportation of hydrogen via road, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affect the transportation of hydrogen via road, write “No”.</p> <p><u>Important note:</u> liquid organic hydrogen carriers (LOHCs), ammonia (NH₃), methanol (CH₃OH), can also be considered hydrogen-derived products. In the contexts of this category, only Policy Objectives/Policy Instruments that include these as a transport medium of hydrogen are to be coded with “Yes” in these sections, if the intervention only mentions these as derived products of hydrogen, i.e. as production of derived products/Power-to-X, they are to be coded with “No” in this category.</p>	Yes/No
Transport and Storage Infrastructure - Transport Infrastructure Maritime	Policy Instruments - Tech/Sector	<p>Definition and Explanation: as mentioned in previous explanations, hydrogen can be transported via maritime. <u>Hydrogen derivatives</u> can be transported via maritime (ships), through different ways: LOHCs, ammonia and methanol in tankers. Currently, hydrogen in its pure state is not transported via maritime on a large scale, but the first tanker created for the transport of liquid hydrogen was successfully built in 2020.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the transportation of hydrogen via maritime, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affect the transportation of hydrogen via maritime, write “No”.</p> <p><u>Important note:</u> liquid organic hydrogen carriers (LOHCs), ammonia (NH₃), methanol (CH₃OH), can also be considered hydrogen-derived products. In the contexts of this category, only Policy Objectives/Policy Instruments that include these as a transport medium of hydrogen are to be coded with “Yes” in these sections, if the intervention only mentions these as derived products of hydrogen, i.e. as production of derived products/Power-to-X, they are to be coded with “No” in this category.</p>	Yes/No
Transport and Storage Infrastructure - Storage Infrastructure General	Policy Instruments - Tech/Sector	<p>Definition and Explanation: There exist two ways of storing hydrogen that can be divided into 1) physical methods and 2) material-based methods. 1) Hydrogen Physical storage methods include: compressed gaseous hydrogen (CGH₂) and liquified hydrogen (LH₂); 2) Hydrogen Material-based storage methods include: liquid organic hydrogen carriers (LOHCs), ammonia (NH₃), methanol (CH₃OH), and metal hydrides.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the storage of hydrogen, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affect the storage of hydrogen, write “No”. <u>Important note:</u> liquid organic hydrogen carriers (LOHCs), ammonia (NH₃), methanol (CH₃OH),</p>	Yes/No

		can also be considered hydrogen-derived products. In the contexts of this category, only Policy Objectives/Policy Instruments that include these as a storage medium of hydrogen are to be coded with “Yes” in these sections, if the intervention only mentions these as derived products of hydrogen, i.e. as production of derived products/Power-to-X, they are to be coded with “No” in this category.	
Policy Instruments - Types	Policy Instruments - Type	<p>Definition and Explanation: policy instruments are the methods used by the government and/or public entities to promote certain actions to achieve a defined set of objectives. In other words, policy instruments are the connection between policy formulation and policy implementation. In this category, the policy instruments are categorized by technology/ sector. For an intervention to be considered a Policy Instrument, it must be stated and/or it should be a part of an Official document, that include an action or set of actions making that intervention an instrument. For example, if an intervention and/or a statement only states the need or the desire to attain something or to do something but is not accompanied by an instrument, the intervention cannot be considered a Policy Instrument. In this category, the policy instruments are categorized by policy instrument types.</p> <p>Coding Instruction: based on the explanation above, if an intervention meets the definition of a Policy Instrument, write “Yes” in this column and continue coding the following subcategories, if the intervention does not meet the definition to be a Policy Instrument, write “No” in this column and in the other subcategories in this tab.</p>	Yes/No
Economy Wide Instruments (e.g. CO2 Pricing, removal of fossil fuel subsidies)	Policy Instruments - Type	<p>Definition and Explanation: Non sector specific policy that provides a relative advantage to climate-friendly products and economic activities compared to the status quo. For example, CO2 pricing, removal of fossil fuel subsidies, etc.).</p> <p>Coding Instruction: based on the explanation above, if the intervention is a Policy Instrument that meets the definition of an Economy Wide Instrument, write “Yes”, if the intervention is a Policy Instrument that does not meet the definition of an Economy Wide Instrument, write “No”.</p>	Yes/No
R&D Promotion	Policy Instruments - Type	<p>Definition and Explanation: R&D promotion refers to those policy instrument focused on endorsing research and development (R&D) for Hydrogen in parts and/or in its whole value chain. R&D “comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge to devise new applications. R&D covers three activities: basic research, applied research and experimental development”. It encompasses the policy instruments whose goal is to encourage research and development of the whole Hydrogen value chain.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a Policy Instrument that addresses or directly affects the promotion of R&D of a part and/or the whole Hydrogen value chain, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affect, the promotion of R&D of a part and/or the whole Hydrogen value chain, write “No”.</p>	Yes/No
R&D Promotion - Tax Incentives	Policy Instruments - Type	<p>Definition and Explanation: “taxes are compulsory, unrequited payments to general government. They are unrequited in the sense that benefits provided by government to taxpayers are not normally in proportion to their payments” (OECD, 2022). Following this definition of tax, tax incentive refers to “any tax law/regulation that targets tax relief (lower tax burden) to a certain subset of activities” (OECD, 2012, p.2). In this vein, tax incentives for R&D Promotion of Hydrogen encompass those tax</p>	Yes/No

		<p>laws and/or regulations that target a tax relief in research and development for a part or the whole Hydrogen value chain. R&D “comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge to devise new applications. R&D covers three activities: basic research, applied research and experimental development”.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a tax incentive that addresses or directly affects the promotion of R&D of a part and/or the whole Hydrogen value chain, write “Yes”, if the intervention is not a tax incentive that addresses or directly affects the promotion of R&D of a part and/or the whole Hydrogen value chain, write “No”.</p>	
R&D Promotion - Grants/Subsidies	Policy Instruments - Type	<p>Definition and Explanation: grants and/or subsidies refer to those payments made by public entities to other actors for which no repayment is required. In this context, grants/subsidies for R&D Promotion of Hydrogen encompass those grants/subsidies that are given to promote R&D projects for parts of and/or the whole Hydrogen value chain. R&D “comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge to devise new applications. R&D covers three activities: basic research, applied research and experimental development”.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a grant/subsidy that addresses or directly affects the promotion of R&D of a part and/or the whole Hydrogen value chain, write “Yes”, if the intervention is not a grant/subsidy that addresses or directly affects the promotion of R&D of a part and/or the whole Hydrogen value chain, write “No”.</p>	Yes/No
R&D Promotion - Other Instruments	Policy Instruments - Type	<p>Definition and Explanation: in addition to tax incentives and grants/subsidies, there exist other policy instruments to endorse research and development (R&D) for Hydrogen in parts and/or in its whole value chain. R&D “comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge to devise new applications. R&D covers three activities: basic research, applied research and experimental development”.</p> <p>Coding Instruction: if an intervention meets the definition of a policy instrument that addresses or directly affects the promotion of research and development of a part and/or the whole Hydrogen value chain but does not meet the definition of tax incentive and/or grant/subsidy, write “Yes”, if the intervention is a policy instrument that meets the definition of tax incentive and/or grant/subsidy for R&D promotion that addresses or directly affects the promotion of research and development of a part and/or the whole Hydrogen value chain, write “No”.</p>	Yes/No
Investment Promotion	Policy Instruments - Type	<p>Definition and Explanation: the objective of looking into the instruments to Promote Hydrogen Production, and/or, Hydrogen Use, and/or Storage and Transport Infrastructure is ultimately looking into what instruments are being developed and implemented to promote investment in these areas i.e., in the elements of the hydrogen value chain. Thus, these 3 main areas Hydrogen Production, Hydrogen Use, and Storage and Transport Infrastructure are encompassed in this main category, Investment Promotion.</p> <p>Coding Instruction: mark this column with “Yes” if an intervention meets the definition of a Policy Instrument that impacts on Promotion of Hydrogen Production, and/or, Promotion of Hydrogen Use, and/or Promotion of Storage and Transport Infrastructure.</p>	Yes/No

Promotion of Hydrogen Production - General	Policy Instruments - Type	<p>Definition and Explanation: promotion of hydrogen production indicates those policy instrument focused on endorsing the production of Hydrogen. It encompasses the policy instruments whose goal is to encourage the production of Hydrogen.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a policy instrument that addresses or directly affects the promotion of production of Hydrogen, write “Yes”, if the intervention is a policy instrument that does not address or directly affect the promotion of production of Hydrogen, write “No”.</p>	Yes/No
Promotion of Hydrogen Production - Tax Incentives	Policy Instruments - Type	<p>Definition and Explanation: a tax incentive refers to “any tax law/regulation that targets tax relief (lower tax burden) to a certain subset of activities” (OECD, 2012, p.2). In this vein, tax incentives for promotion of Hydrogen production encompass those tax laws and/or regulations that target a tax relief in Hydrogen production.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a tax incentive that addresses or directly affects the promotion of Hydrogen production, write “Yes”, if the intervention is not a tax incentive that addresses or directly affects the promotion of Hydrogen production, write “No”.</p>	Yes/No
Promotion of Hydrogen Production - Grants/Subsidies	Policy Instruments - Type	<p>Definition and Explanation: grants and/or subsidies refer to those payments made by public entities to other actors for which no repayment is required. In this context, grants/subsidies for promotion of production of Hydrogen encompass those grants/subsidies that are given directly to promote the production of Hydrogen.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a grant/subsidy that addresses or directly affects the promotion of Hydrogen production, write “Yes”, if the intervention is not a grant/subsidy that addresses or directly affects the promotion of Hydrogen production, write “No”.</p> <p><u>Important note:</u> if there is a grant/subsidy given for promotion of R&D specific for the production of hydrogen, this is marked with “Yes” on: R&D Promotion General, R&D Promotion-Grants/Subsidies, and in the category of Promotion of Hydrogen Production is marked with “Yes” on Promotion of Hydrogen Production General, and on Promotion of Hydrogen Production Other Instruments.</p>	Yes/No
Promotion of Hydrogen Production - Grants/Subsidies - Auctions	Policy Instruments - Type	<p>Definition and Explanation: an auction is a public offer where goods or property are vended to the highest bidder. Auctions are used as a mechanism by public entities to offer grants/subsidies in a transparent and competitive manner to actors that meet established requirements and due to their fitting and competitive proposal/price win the auction and are given the grant/subsidy. In this vein, grants/subsidies can be given to actors to promote the production of Hydrogen through an auction mechanism.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a grant/subsidy that addresses or directly affects the promotion of Hydrogen production that is given to actors through an auction mechanism, write “Yes”, if the intervention is not a grant/subsidy that addresses or directly affects the promotion of Hydrogen production that is given to actors through an auction mechanism, write “No”.</p>	Yes/No

<p>Promotion of Hydrogen Production - Grants/Subsidies- Other</p>	<p>Policy Instruments - Type</p>	<p>Definition and Explanation: in addition to auctions, grants/subsidies can be given to actors through other mechanisms. Some examples of such instruments can be Capital Subsidies where actors can receive a subsidy for every X amount of hydrogen produced, or for every X amount of money spent in a FCEV.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a grant/subsidy that addresses or directly affects the promotion of Hydrogen production that is given to actors through a different mechanism than auctions, write “Yes”, if the intervention is a grant/subsidy that addresses or directly affects the promotion of Hydrogen production but is given to actors through an auction mechanism, write “No”.</p> <p><u>Important Note:</u> if the intervention does not mention that the grant/subsidy was given through an auction then it immediately qualifies to be coded with “Other”.</p>	
<p>Promotion of Hydrogen Production - Regulatory Instruments</p>	<p>Policy Instruments - Type</p>	<p>Definition and Explanation: regulatory instruments can be defined as legal norms with which public entities attempt to direct specific set of actions in the public interest. Examples of regulatory instruments can be prohibitions, commands, permits, licenses, etc. In this context, regulatory instruments for the promotion of Hydrogen production are those legal norms with which public entities aim at promoting the production of Hydrogen.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a regulatory instrument that addresses or directly affects the promotion of Hydrogen production, write “Yes”, if the intervention is not a regulatory instrument that addresses or directly affects the promotion of Hydrogen production, write “No”.</p>	<p>Yes/No</p>
<p>Promotion of Hydrogen Production - Public Procurement</p>	<p>Policy Instruments - Type</p>	<p>Definition and Explanation: public procurement refers to the purchase of goods, services and works by public entities. In this vein, promotion of hydrogen production through public procurement, refers to those purchases made by public entities aimed at encouraging the production of Hydrogen.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a purchase made by public entities (public procurement) that addresses or directly affects the promotion of Hydrogen production, write “Yes”, if the intervention is not a purchase made by public entities (public procurement) that addresses or directly affects the promotion of Hydrogen production, write “No”.</p>	<p>Yes/No</p>
<p>Promotion of Hydrogen Production - Other Instruments</p>	<p>Policy Instruments - Type</p>	<p>Definition and Explanation: in addition to tax incentives, grants/subsidies (given through auctions and through other mechanisms), regulatory instruments, and public procurement there exist other policy instruments to endorse the production of Hydrogen.</p> <p>Coding Instruction: in accordance to the explanation above, if an intervention meets the definition of a policy instrument that addresses or directly affects the promotion of Hydrogen production but does not meet the definition of any of the other policy instrument types defined above (tax incentives, grants/subsidies (given through auctions and through other mechanisms), regulatory instruments, and public procurement), write “Yes”, if the intervention is a policy instrument that addresses or directly affects the promotion of Hydrogen production but meets the definition of any of the other policy instrument types defined above (tax incentives, grants/subsidies (given through auctions and through other</p>	<p>Yes/No</p>

		<p>mechanisms), regulatory instruments, and public procurement), write “No”.</p> <p><u>Important note:</u> hydrogen production can be promoted through R&D, if the intervention is an R&D funding initiative it is marked with “Yes” on R&D Promotion General, R&D Promotion Grants/Subsidies, and in the category of Promotion of Hydrogen Production is marked with “Yes” on Promotion of Hydrogen Production General and in Promotion of Hydrogen Production Other Instruments. The latter because the grant in this case is oriented towards the R&D Project and is not directly given to producing hydrogen, in this way hydrogen production is promoted through R&D which in this case falls under the subcategory of “Other Instruments”.</p>	
Promotion of Hydrogen Use - General	Policy Instruments - Type	<p>Definition and Explanation: promotion of hydrogen use indicates those policy instrument focused on endorsing the use of Hydrogen. It encompasses the policy instruments whose goal is to encourage the use of Hydrogen.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a policy instrument that addresses or directly affects the promotion of Hydrogen use, write “Yes”, if the intervention is a Policy Instrument that does not address or directly affect the promotion of Hydrogen use, write “No”.</p>	Yes/No
Promotion of Hydrogen Use - Tax Incentives	Policy Instruments - Type	<p>Definition and Explanation: a tax incentive refers to “any tax law/regulation that targets tax relief (lower tax burden) to a certain subset of activities” (OECD, 2012, p.2). In this vein, tax incentives for promotion of use of Hydrogen encompass those tax laws and/or regulations that target a tax relief in Hydrogen usage.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a tax incentive that addresses or directly affects the promotion of Hydrogen use, write “Yes”, if the intervention is not a tax incentive that addresses or directly affects the promotion of Hydrogen use, write “No”.</p>	Yes/No
Promotion of Hydrogen Use - Grants/Subsidies	Policy Instruments - Type	<p>Definition and Explanation: grants and/or subsidies refer to those payments made by public entities to other actors for which no repayment is required. In this context, grants/subsidies for promotion of use of Hydrogen encompass those grants/subsidies that are given to promote the use of Hydrogen.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a grant/subsidy that addresses or directly affects the promotion of Hydrogen use, write “Yes”, if the intervention is not a grant/subsidy that addresses or directly affects the promotion of Hydrogen use, write “No”.</p> <p><u>Important note:</u> if there is a grant/subsidy given for promotion of R&D specific for the use of hydrogen, this is marked with “Yes” on: R&D Promotion General, R&D Promotion-Grants/Subsidies, and in the category of Promotion of Hydrogen Use is marked with “Yes” on Promotion of Hydrogen Use General, and on Promotion of Hydrogen Use Other Instruments.</p>	Yes/No
Promotion of Hydrogen Use - Grants/Subsidies - Auctions	Policy Instruments - Type	<p>Definition and Explanation: an auction is a public offer where goods or property are vended to the highest bidder. Auctions are used as a mechanism by public entities to offer grants/subsidies in a transparent and competitive manner to actors that meet established requirements and due to their fitting and competitive proposal/price win the auction and are given the grant/subsidy. In this vein, grants/subsidies can be</p>	Yes/No

		<p>given to actors to promote the use of Hydrogen through an auction mechanism.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a grant/subsidy that addresses or directly affects the promotion of Hydrogen use that is given to actors through an auction mechanism, write “Yes”, if the intervention is not a grant/subsidy that addresses or directly affects the promotion of Hydrogen use that is given to actors through an auction mechanism, write “No”.</p>	
Promotion of Hydrogen Use - Grants/Subsidies - Other	Policy Instruments - Type	<p>Definition and Explanation: in addition to auctions, grants/subsidies can be given to actors through other mechanisms. Some examples of such instruments can be Capital Subsidies where actors can receive a subsidy for every X amount of hydrogen produced, or for every X amount of money spent in a FCEV.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a grant/subsidy that addresses or directly affects the promotion of Hydrogen use that is given to actors through a different mechanism than auctions, write “Yes”, if the intervention is a grant/subsidy that addresses or directly affects the promotion of Hydrogen production but is given to actors through an auction mechanism, write “No”.</p> <p><u>Important Note:</u> if the intervention does not mention that the grant/subsidy was given through an auction then it immediately qualifies to be coded with “Other”.</p>	Yes/No
Promotion of Hydrogen Use - Regulatory Instruments	Policy Instruments - Type	<p>Definition and Explanation: regulatory instruments can be defined as legal norms with which public entities attempt to direct specific set of actions in the public interest. Examples of regulatory instruments can be prohibitions, commands, permits, licenses, etc. In this context, regulatory instruments for the promotion of Hydrogen use are those legal norms with which public entities aim at promoting the use of Hydrogen.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a regulatory instrument that addresses or directly affects the promotion of Hydrogen use, write “Yes”, if the intervention is not a regulatory instrument that addresses or directly affects the promotion of Hydrogen use, write “No”.</p>	Yes/No
Promotion of Hydrogen Use - Public Procurement	Policy Instruments - Type	<p>Definition and Explanation: public procurement refers to the purchase of goods, services and works by public entities. In this vein, promotion of hydrogen use through public procurement, refers to those purchases made by public entities aimed at encouraging the usage of Hydrogen.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a purchase made by public entities (public procurement) that addresses or directly affects the promotion of Hydrogen usage, write “Yes”, if the intervention is not a purchase made by public entities (public procurement) that addresses or directly affects the promotion of Hydrogen usage, write “No”.</p>	Yes/No
Promotion of Hydrogen Use - Other Instruments	Policy Instruments - Type	<p>Definition and Explanation: in addition to tax incentives, grants/subsidies (given to actors through auctions and other mechanisms), regulatory instruments, and public procurement there exist other policy instruments to endorse the use of Hydrogen.</p> <p>Coding Instruction: in accordance to the explanation above, if an intervention meets the definition of a policy instrument that addresses or directly affects the promotion of Hydrogen usage</p>	Yes/No

		<p>but does not meet the definition of any of the other policy instrument types defined above (tax incentives, grants/subsidies (given to actors through auctions or other mechanisms), regulatory instruments, and public procurement), write “Yes”, if the intervention is a policy instrument that addresses or directly affects the promotion of Hydrogen usage but meets the definition of any of the other policy instrument types defined above (tax incentives, grants/subsidies (given to actors through auctions or other mechanisms), regulatory instruments, and public procurement), write “No”.</p> <p><u>Important note:</u> hydrogen use can be promoted through R&D, if the intervention is an R&D funding initiative it is marked with “Yes” on R&D Promotion General, R&D Promotion Grants/Subsidies, and in the category of Promotion of Hydrogen Use is marked with “Yes” on Promotion of Hydrogen Use General and in Promotion of Hydrogen Use Other Instruments. The latter because the grant in this case is oriented towards the R&D Project and is not directly given to using hydrogen, in this way hydrogen use is promoted through R&D which in this case falls under the subcategory of “Other Instruments”.</p>	
Promotion of Transport and Storage Infrastructure - General	Policy Instruments - Type	<p>Definition and Explanation: promotion of storage and transport infrastructure indicates those policy instrument focused on endorsing the development of Hydrogen storage and transport infrastructure. It encompasses the policy instruments whose goal is to encourage the development of Hydrogen storage and transport infrastructure.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a policy instrument that addresses or directly affects the promotion of Hydrogen storage and transport/storage and transport infrastructure, write “Yes”, if the intervention is a policy instrument that does not address or directly affect the promotion of Hydrogen storage and transport/storage and transport infrastructure, write “No”.</p>	Yes/No
Promotion of Transport and Storage Infrastructure - Tax Incentives	Policy Instruments - Type	<p>Definition and Explanation: a tax incentive refers to “any tax law/regulation that targets tax relief (lower tax burden) to a certain subset of activities” (OECD, 2012, p.2). In this vein, tax incentives for promotion of storage and transport infrastructure of Hydrogen encompass those tax laws and/or regulations that target a tax relief in storage and transport/storage and transport infrastructure of Hydrogen.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a tax incentive that addresses or directly affects the promotion of storage and transport/storage and transport infrastructure of Hydrogen, write “Yes”, if the intervention is not a tax incentive that addresses or directly affects the promotion of storage and transport/storage and transport infrastructure of Hydrogen, write “No”.</p>	Yes/No
Promotion of Transport and Storage Infrastructure - Grants/Subsidies	Policy Instruments - Type	<p>Definition and Explanation: grants and/or subsidies refer to those payments made by public entities to other actors for which no repayment is required. In this context, grants/subsidies for promotion of storage and transport infrastructure of Hydrogen encompass those grants/subsidies that are given to promote the storage and transport of Hydrogen.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a grant/subsidy that addresses or directly affects the promotion of storage and transport/storage and transport infrastructure of Hydrogen, write “Yes”, if the intervention is not a grant/subsidy that addresses or directly affects the promotion of storage and transport/storage and transport infrastructure of Hydrogen, write “No”.</p>	Yes/No

		<p><u>Important note:</u> if there is a grant/subsidy given for promotion of R&D specific for the hydrogen storage and infrastructure, this is marked with “Yes” on: R&D Promotion General, R&D Promotion-Grants/Subsidies, and in the category of Promotion of Storage and Transport Infrastructure is marked with “Yes” on Promotion of Storage and Transport Infrastructure General, and on Promotion of Storage and Transport Infrastructure Other Instruments.</p>	
Promotion of Transport and Storage Infrastructure - Grants/Subsidies - Auctions	Policy Instruments - Type	<p>Definition and Explanation: an auction is a public offer where goods or property are vended to the highest bidder. Auctions are used as a mechanism by public entities to offer grants/subsidies in a transparent and competitive manner to actors that meet established requirements and due to their fitting and competitive proposal/price win the auction and are given the grant/subsidy. In this vein, grants/subsidies can be given to actors to promote the storage and transport/transport and storage infrastructure of Hydrogen through an auction mechanism.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a grant/subsidy that addresses or directly affects the promotion of storage and transport/storage and transport infrastructure of Hydrogen that is given to actors through an auction mechanism, write “Yes”, if the intervention is not a grant/subsidy that addresses or directly affects the promotion of storage and transport/storage and transport infrastructure of Hydrogen that is given to actors through an auction mechanism, write “No”.</p>	Yes/No
Promotion of Transport and Storage Infrastructure - Grants/Subsidies - Other	Policy Instruments - Type	<p>Definition and Explanation: in addition to auctions, grants/subsidies can be given to actors through other mechanisms. Some examples of such instruments can be Capital Subsidies where actors can receive a subsidy for every X amount of hydrogen produced, or for every X amount of money spent in a FCEV.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a grant/subsidy that addresses or directly affects the promotion of storage and transport/storage and transport infrastructure of Hydrogen that is given to actors through a different mechanism than auctions, write “Yes”, if the intervention is a grant/subsidy that addresses or directly affects the promotion of storage and transport/storage and transport infrastructure of Hydrogen but is given to actors through an auction mechanism, write “No”.</p> <p><u>Important Note:</u> if the intervention does not mention that the grant/subsidy was given through an auction then it immediately qualifies to be coded with “Other”.</p>	Yes/No
Promotion of Transport and Storage Infrastructure - Regulatory Instruments	Policy Instruments - Type	<p>Definition and Explanation: regulatory instruments can be defined as legal norms with which public entities attempt to direct specific set of actions in the public interest. Examples of regulatory instruments can be prohibitions, commands, permits, licenses, etc. In this context, regulatory instruments for the promotion of storage and transport/storage and transport infrastructure of Hydrogen are those legal norms with which public entities aim at promoting storage and transport/storage and transport infrastructure of Hydrogen.</p> <p>Coding Instruction: according to the explanation above, if the intervention is a regulatory instrument that addresses or directly affects the promotion of storage and transport/storage and transport infrastructure of Hydrogen, write “Yes”, if the intervention is not a regulatory instrument that addresses or</p>	Yes/No

		directly affects the promotion of storage and transport/storage and transport infrastructure of Hydrogen, write “No”.	
Promotion of Transport and Storage Infrastructure - Public Procurement	Policy Instruments - Type	<p>Definition and Explanation: public procurement refers to the purchase of goods, services and works by public entities. In this vein, promotion of storage and transport/storage and transport infrastructure of Hydrogen through public procurement, refers to those purchases made by public entities aimed at encouraging the storage and transport/storage and transport infrastructure of Hydrogen.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a purchase made by public entities (public procurement) that addresses or directly affects the promotion of storage and transport/storage and transport infrastructure of Hydrogen, write “Yes”, if the intervention is not a purchase made by public entities (public procurement) that addresses or directly affects the promotion of storage and transport/storage and transport infrastructure of Hydrogen, write “No”.</p>	Yes/No
Promotion of Transport and Storage Infrastructure - Other Instruments	Policy Instruments - Type	<p>Definition and Explanation: in addition to tax incentives, grants/subsidies (given to actors through auctions and other mechanisms), regulatory instruments, and public procurement there exist other policy instruments to endorse the storage and transport/storage and transport infrastructure of Hydrogen.</p> <p>Coding Instruction: in accordance to the explanation above, if an intervention meets the definition of a policy instrument that addresses or directly affects the promotion of storage and transport/storage and transport infrastructure of Hydrogen but does not meet the definition of any of the other policy instrument types defined above (tax incentives, grants/subsidies(given to actors through auctions and other mechanisms) , regulatory instruments, and public procurement), write “Yes”, if the intervention is a policy instrument that addresses or directly affects the promotion of storage and transport/storage and transport infrastructure of Hydrogen but meets the definition of any of the other policy instrument types defined above (tax incentives, grants/subsidies (given to actors through auctions and other mechanisms) , regulatory instruments, and public procurement), write “No”.</p> <p><u>Important note:</u> storage and transport infrastructure can be promoted through R&D, if the intervention is an R&D funding initiative it is marked with “Yes” on R&D Promotion General, R&D Promotion Grants/Subsidies, and in the category of Promotion of Storage and Transport Infrastructure is marked with “Yes” on Promotion of Storage and Transport Infrastructure General and in_Promotion of Storage and Transport Infrastructure Other Instruments. The latter because the grant in this case is oriented towards the R&D Project and is not directly given to storing and/or transporting hydrogen or for building/enhancing/adapting the infrastructure, in this way hydrogen storage and transport are promoted through R&D which in this case falls under the subcategory of “Other Instruments”.</p>	Yes/No
Education and Information General	Policy Instruments - Type	<p>Definition and Explanation: education and information policy instruments refer to those “actions to increase public awareness, to induce behaviour change and to provide education” to support/promote a certain goal. In this context, education and information policy instruments for Hydrogen encompass those actions destined to increase public awareness, encourage change of behaviour and offer education on the Hydrogen topic. The overall goal of these policies in this context is to encourage the production and use of Hydrogen throughout all its value chain through “non-technical measures”.</p>	Yes/No

		<p>Coding Instruction: according to the explanation above, if the intervention is a policy instrument that meets the definition of an education and information instrument focused on endorsing Hydrogen in all or any part of the Hydrogen value chain, write “Yes”, if the intervention does not meet the definition of an education and information instrument focused on endorsing Hydrogen in all or any part of the Hydrogen value chain, write “No”.</p>	
Education and Information - Education/ Training	Policy Instruments - Type	<p>Definition and Explanation: education/training refer to those education and information policy instruments implemented to ensure that information on the specific topic in concern is transparent and widely disseminated. In education and training, the dissemination of information is carried out through educational channels and in educational formats and/or in training programs and campaigns. In this vein, education and information measures can be carried out for the topic of Hydrogen in a part or its whole value chain.</p> <p>Coding Instruction: based on the explanation above, if the intervention meets the definition of an education and information policy instrument to be carried out through education and/or training for all or any part of the Hydrogen value chain, write “Yes”, if the intervention does not meet the definition of an education and information instrument to be carried out through education and/or training for all or any part of the Hydrogen value chain, write “No”.</p>	Yes/No
Education and Information - Awareness Raising	Policy Instruments - Type	<p>Definition and Explanation: awareness raising refer to those education and information policy instruments aimed at fostering awareness of a specific issue. In this context, awareness raising measures are those destined to increase awareness in the topic of Hydrogen. These measures can take form of communication campaigns, programs, workshops, etc. whose central goal is to raise awareness on the topic of Hydrogen.</p> <p>Coding Instruction: based on the explanation above, if the intervention is an education and information policy instrument to be carried out through awareness raising for all or any part of the Hydrogen value chain, write “Yes”, if the intervention does not meet the definition of an education and information instrument to be carried out through awareness raising for all or any part of the Hydrogen value chain, write “No”.</p>	Yes/No
Education and Information - Labelling	Policy Instruments - Type	<p>Definition and Explanation: labelling indicates the action of requiring or voluntarily providing labels in products that deliver thorough information to the consumer of the whole product or of specifications of it. Labelling or in other cases known as certification scheme refer to the “formal evaluation of products, services and processes by an independent and accredited body against a defined set of criteria, standards, and the issuing of a certificate indicating conformance”.</p> <p>Coding Instruction: based on the explanation above, if the intervention meets the definition of an education and information policy instrument for labelling measures/programmes in all or any part of the Hydrogen value chain, write “Yes”, if the intervention does not meet the definition of an education and information policy instrument for labelling measures/programmes in all or any part of the Hydrogen value chain, write “No”.</p>	Yes/No
Education and Information - Quality Infrastructure	Policy Instruments - Type	<p>Definition and Explanation: quality infrastructure (QI) can be defined as the set of measures established to guarantee that products and services are secure and comply with high quality</p>	Yes/No

		<p>requirements. In this way, the QI main elements are: metrology, standardization, accreditation, and conformity assessment (testing, certification and inspection). In other words, Kellermann (2019) defines the QI system as “the organizations (public and private), policies, and relevant legal and regulatory frameworks and practices needed to support and enhance the quality, safety, and environmental soundness of goods, services, and processes”.</p> <p>Coding Instruction: based on the explanation above, if the intervention meets the definition of an education and information policy Instrument for QI measures in all or any part of the Hydrogen value chain, write “Yes”, if the intervention does not meet the definition of an education and information policy Instrument for QI measures in all or any part of the Hydrogen value chain, write “No”.</p>	
Voluntary Agreements	Policy Instruments - Type	<p>Definition and Explanation: voluntary agreements are a type of voluntary approach in policy that are “negotiated with industry and public programmes in which firms can volunteer to participate”.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a policy instrument that addresses or directly affects voluntary agreements in all or any part of the Hydrogen value chain, write “Yes”, if the intervention is a policy instrument that does not address or directly affect voluntary agreements in all or any part of the Hydrogen value chain, write “No”.</p>	Yes/No
Network/Cluster Promotion	Policy Instruments - Type	<p>Definition and Explanation: clusters (networks) are integrated firms in associated lines of business concentrated in a specific geographic location. Promotion of Networks/Clusters encompass those policy instruments- except grants or subsidies provided to individual entities- focused on building regional (clusters in regions inside one country) clusters and/or networks, in this specific context, for Hydrogen in parts of, or all its value chain.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a policy instrument that addresses or directly affects the promotion of networks/clusters for all or any part of the Hydrogen value chain, write “Yes”, if the intervention is a policy instrument that does not address or directly affect the promotion of networks/clusters for all or, any part of the Hydrogen value chain, write “No”.</p>	Yes/No
International Initiatives	Policy Instruments - Type	<p>Definition and Explanation: international initiatives encompass all policy interventions with an international component. i.e. international partnerships with one or many countries and/or one or many international private actors, and/or domestic interventions that include/allow the participation of international actors (Public and/or Private). In this context, these international initiatives are those focused on parts of, or all the Hydrogen value chain.</p> <p>Coding Instruction: based on the explanation above, if the intervention is a policy instrument that has an international component, write “Yes”, if the intervention is a policy instrument that does not have and international component, write “No”.</p> <p>International Initiatives TAG: this column will be marked with “Yes” when an intervention touches on both International Initiatives and another of the big categories (level 1); this means that for these cases the column o that other big category and the International Initiatives Tag column will be marked with “Yes”; for example, Germany and Australia have a research</p>	Yes/No

		<p>program called HyGate, this program is focused on Research (for the development of the supply chain, but the MAIN FOCUS is R&D (criteria for this can be found on the explanation of "Multiple") but is also international, as it is an international cooperation agreement within two countries, in this case, R&D Promotion will be marked with Yes, and the International Initiatives TAG will be marked with "Yes".</p> <p>*Distinction between column International Initiatives and International TAG: the column International Initiatives will be marked with "Yes" when the intervention is ONLY International Initiative and not something else, when an intervention is both international and touches also on other of the big categories (level 1), one marks with "Yes" the International Initiatives Tag column.</p>	
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Frequently Asked Questions (FAQs)

What are the main sources to look for the interventions?

The general recommendation for sources to look for interventions are four main ones: i) Government/Ministry's Websites; ii) Press releases; iii) Articles/Media; and iv) Academic Papers. These are of course additional to any other sources that the user finds useful for her specific case.

At which point do I know I have looked enough for a missing piece of information?

As a rule of thumb, the user can harness the four main sources mentioned above (: i) Government/Ministry's Websites; ii) Press releases; iii) Articles/Media; and iv) Academic Papers) to follow a guideline to look for a missing piece of information. It is relevant to highlight that the information on the database should be publicly available information. Thus, if a piece of information is not found on the sources mentioned above or any other publicly available sources, it probably means that the piece of information is not public, and therefore that space can be left in blank.

Many interventions are laws or programs by themselves, should I leave the space in blank when the intervention is a programme/law by itself?

As explained in the [„Data Collection Table“](#), in the [„Law/Program that sustains it“](#) segment, if the intervention is a Law or Program itself, write the name of it in this space.

How do I proceed when there are several sources of funding?

As explained in the [„Data Collection Table“](#) in the [„Amount of Funding“](#) segment, if an intervention has several sources of funding/ the funding comes from several different entities, in this space the user its o write the total amount of funding and in the [„Brief explanation“](#) segment, write the specification. For example: Funding: (Federal Government 3000€, Utility 4000€).

Should I also include provincial initiatives?

While the main objective of this database is to collect and code the interventions/initiatives at the Federal level, if the user finds interventions/initiatives that are relevant for the hydrogen policy landscape of the country at the provincial/state/regional/subnational level, these can be included in the database. Just make sure to state the level of the intervention in the [“Federal/Provincial”](#) space, according to the instructions of that segment (“Federal/Provincial”).

What should I write down in the column “Federal/Provincial” if the intervention is of international scope?

Regardless of the intervention being of international scope, i.e. it is an [“International Initiative”](#), what matters in this segment ([“Federal/Provincial”](#)) is if the intervention was issued at the Federal/National level or at the Subnational one. Thus, if in an intervention is of international scope and was issued at the Federal/National level, write here: “Federal”, if the intervention is of international scope and was issued at the Subnational level (Provincial, Regional, State level), write here: “Provincial”.

What should I do if the intervention doesn’t have a “Starting Date” and/or “End Date”?

If there is no information found on the [“Starting Date”](#) and/or [“End Date”](#) after checking the four main sources or simply it does not apply to the intervention that it has a precise “Starting Date” and/or “End Date”, this segment(s) can be left in blank.

There are some initiatives (programmes) that do not directly relate to hydrogen but some of their projects do. Should I enter the initiative as a whole or only the single projects that relate to hydrogen?

In this case, enter the single projects related to hydrogen and the overall program would be the “Law/Program that sustains it”. Thus write the name of that overall program in the [“Law/Program that sustains it”](#) segment.

What is the correct way to register laws that: 1) did not affect hydrogen from the very beginning but after they got amended, and 2) have been amended several times?

For 1: enter on the database the amendment of the law that includes hydrogen. For 2: if a new amendment affects the same issue on hydrogen, delete the old one and keep the newest amendment. If new amendments add issues on hydrogen, i.e., are additional interventions on hydrogen include those separately.

How should I code an Intervention in “Policy Instruments Tech/Sector” if the policy document only states the need for improving the existing regulation and policy mechanism?

As explained in the segment of [Policy Instruments Tech/Sector](#), for an intervention to be considered a Policy Instrument, it must be stated and/or it should be a part of an Official Document that includes an action or set of actions making that intervention an instrument. For example, if an intervention and/or a statement only states the need or the desire to attain something or to do something but is not accompanied by an instrument, the intervention cannot be considered a Policy Instrument. Thus, in this case, this intervention would be coded with “No” on “Policy Instruments Tech/Sector” and in all its subsequent subcategories.

Should a state's great initiative of a network that extends internationally (e.g., the Chinese Belt and Road Initiative (BRI)) be included as "Network/Cluster Promotion"?

Like explained in the [„Network/Cluster Promotion“](#) segment of the [„Policy Instrument Types“](#) category, clusters (networks) are integrated firms in associated lines of business concentrated in a specific geographic location. The latter means that these Network/Clusters have to be within national boundaries. Thus in the example of this question, the BRI would be coded with „No“ on [„Network/Cluster Promotion“](#).

How should I deal with "cheaper renewable power prices" when coding "Policy Instruments by Tech/Sector"?

Here it is important to consider if the intervention clearly mentions the impact of this initiative on hydrogen. I.e. if the policy instrument clearly states that this „aid“ in the prices of renewables impacts the use of these in the production of hydrogen via electrolysis then, the intervention should be coded with „Yes“ on [„Policy Instruments Tech/Sector“](#) and in its following subcategories: [„Production General“](#), [„Production Electrolysis General“](#) and [„Production Electrolysis Unspecified“](#) and with „No“ in all the other subcategories of „Policy Instruments Tech/Sector“.

Annex

Policy Instruments by Technology/Sector

Multiple Level 2: Multiple at level 2 only exists for Production, that is if an instrument touches both on Production of Hydrogen and Production of Derived Products (meaning that you are looking at multiplicity horizontally only between Production of hydrogen and Production of derived products). In this way, you will mark this column with “Yes” if an instrument impacts both on Production of Hydrogen and Production of Derived Products i.e., if you marked with “Yes” these two columns and an adjacent subcategory/subcategory of them.

Multiple Level 3: This level of multiple can present itself in all big categories, looking at them vertically, i.e. inside that big category, that is: in Production of Hydrogen: if an instrument touches both on Electrolysis and SMR, or SMR and CCS, etc, or all of them; in Production of Derived Products: if an instrument impacts on Methanol and Ammonia, or LOHC and Fischer Tropsch, etc, or all of them; in Usage BY SECTOR if an instrument touches both on industry and mobility, or heat and power generation ,etc, or all of them; in Transport and Storage if the instrument impacts on both TRANSPORT AND STORAGE. In this way, you will mark this column with “Yes” if the instrument is multiple at level 3 IN ONE OR ANY OF THE CATEGORIES.

Multiple Level 4: Multiple in this level can be found in: Production of Hydrogen-Electrolysis (vertically, i.e. inside the subcategory of Production of Hydrogen-Electrolysis), Usage by Sector-Transport/Mobility (vertically, i.e. inside the subcategory of Usage by Sector-Transport/Mobility), Usage by Sector-Industry (vertically, i.e. inside the subcategory of Usage by Sector-Industry) , and Transport & Storage-Transport (vertically, i.e. inside the subcategory of Transport & Storage-Transport). For example, in Production of Hydrogen-Electrolysis if the instrument touches both on PEM and Alkali, or ALKALI and SOEC, etc. or on all off them; in Usage by Sector-Transport/Mobility, if the instrument touches both on Bus and Trucks, or bus, Trucks, Automobile, or Maritime and Aviation, etc. or all of them; Usage by Sector-Industry if the instrument touches on chemical, steel and cement, or steel and other, etc. or all of them; in Transport, if the instrument impacts on Pipeline and Road, or Maritime and Pipeline, etc. or all of them. In this way, you will mark this column with “Yes” if the instrument is multiple at level 4 IN ONE OR ANY OF THE CATEGORIES.

Multiple at level 5 only exists in Production of Hydrogen-PEM, Alkali, and SOEC. Thus, we are not including a column for this one.

Policy Instruments by Types

Multiple level 2: For Policy Instrument Types, the multiples will be there mostly just for control, mark this column with “Yes” if there is a multiple at level 2 (horizontally) in one or several of the categories. This multiple only exists on Investment Promotion (i.e. between Promotion of Hydrogen production, Promotion of Hydrogen Use and Promotion of Storage and Transport infrastructure), so you will be marking with “Yes” this column if the intervention touches on for example Promotion of Hydrogen Production and Promotion of Hydrogen Usage, or Promotion of Hydrogen Usage and Promotion of Hydrogen Storage and

Transport infrastructure. BUT these must be VERY specific cases, remember that we are strictly aiming at avoiding the multiplicity (double counting), so make sure to check well if you are not coding an instrument that should be split into two instruments.

Multiple level 3: For Policy Instrument Types, the multiples will be there mostly just for control, mark this column with “Yes” if there is a multiple at level 3 (vertically) in one or several of the categories. This multiple only exists on R&D Promotion, the subcategories of Investment Promotion, and Education and Information. You will be marking with “Yes” this column if the intervention touches on for example Tax incentives and Other inside Promotion of Production, and/or Education/Training and Awareness Raising inside Education and Information. BUT these must be VERY specific cases, remember that we are strictly aiming at avoiding the multiplicity (double counting), so make sure to check well if you are not coding an instrument that should be split into two instruments.