

# European Metrology Network for Energy Gases

Strategic Agenda  
Version 1.0 (09/2022)



**ENERGY GASES**

## Authorship and Imprint

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## **Executive Summary**

### Improving reliability in the measurement of energy gases

We are facing an energy transition where new energy gases enter the market at an unprecedented pace. This transition is also accelerated by countries that wish to strengthen their energy resilience to tackle the existing energy crisis in Europe and meet the commitments of the Paris Agreement. The challenge for the metrology community is to facilitate this transition and to be ready, when the industry, grid operators and regulatory bodies need reliable and comparable data and therefore metrological services for a decarbonised gas market.

EURAMET's European Metrology Network for Energy Gases supports this sustainable transition.

### Our Vision

To enable all countries within Europe to access the measurement tools they require to support their energy gas industries including services, products, guidance, and expertise.

### Our Mission

To provide the world's leading metrology network comprising experts in the field of measurement science to drive forward innovation and to accelerate decarbonisation and emissions reductions within the energy gas industry in Europe.

### Measures of success

We bring clear direction in our strategy by defining four areas where we want to succeed. These represent for us the biggest opportunities for engagement and differentiation by

Becoming the preferred partner for energy gas measurement research by understanding the needs of our key stakeholders and promoting a long-term dialogue to co-create the strategic research agenda on energy gas measurements.

Providing access to a large portfolio of coordinated national metrology capabilities, by joining National Metrology Institutes (NMIs) and Designated Institutes (DIs) to solve challenges defined by our stakeholders.

Facilitating research to improve measurement capabilities of European metrology Institutes (NMIs/DIs) to meet the emerging industry needs and develop services of the future.

Boosting the uptake of our results and knowledge through construction of a knowledge centre for metrology for energy gases.

### Implementation

We implement our strategy through coordination of national and European actions that will enable European industry to succeed through improved reliability and interoperability of energy gases measurements.

Joint research on metrology for energy gases: realisation of measurement methods and standards, measurement capabilities and facilities, scientific excellence and support to standardisation. Research on energy gases metrology has been supported by the European Metrology Research Programmes and now in the European Partnership on Metrology.

Coordination of national metrology institutes: leveraging resources of European NMIs and DIs, maintaining top-level national standards and fit-for-purpose services. EMN Energy Gases coordinates the development of new measurement capabilities and dedicated services to meet the rapidly growing needs.

## **Preface**

This document outlines the strategy of the European Metrology Network (EMN) for Energy Gases and covers the period 2021-2030.

EMNs have been established by EURAMET. EURAMET is the regional metrology organisation for Europe, securing world-wide trust and acceptance of European measurements, where National Metrology Institutes (NMIs) of 38 countries plus a larger number of Designated Institutes (DIs) take part. For many years, EURAMET has been facilitating pluriannual metrology research programmes. These programmes are jointly funded by participating states and the EU. EMNs aim particularly to build stronger and permanent links between the European metrology community and high-level stakeholders and to develop sustainable structures to better serve and cooperate with industry, instrument manufacturers, academia, standardisation bodies and regulators.

The European ambition is to be climate neutral in 2050. To facilitate this transition, sustainable energy gases will need to play a key role in replacing coal, oil and ultimately, natural gas. The EMN for Energy Gases specifically focusses on the metrological needs in the market, due to the diversification of energy sources to clean fuels, such as hydrogen, biofuels, biomethane, hydrogen / natural gas mixtures, carbon dioxide, ammonia, and any emerging gaseous fuel. Engagement with stakeholders and increased visibility of NMI/DIs capabilities are essential for success.

This EMN is focused on identifying and bridging the gaps in metrology to facilitate the gas energy transition. The EMN for Energy Gases aims to be the focal point in measurement science for energy gases that brings together energy gas players, end users, and the measurement science community.

After 12 years of EU funded research in the field of metrology, the latest programme of European research on metrology will start in 2021. This new programme is called the European Partnership on Metrology and is part of Horizon Europe. The programme will end in 2027, by which time the NMIs/DIs will be probably dependent on other funding to support their research and development activities. The Partnership is the latest step in the transition from metrology research funded by the European Union to coordinated collaboration without dedicated EU funding.

This Strategic Agenda directs the present and future actions towards partnerships beyond the structural European funding of metrology research in the field of energy gases. This Strategic Agenda is aligned with EURAMET's 2030 Strategy [1].

## The European gas value chain

Combustible gases are produced since the end of the 18th century. In the 19th century cities constructed gas distribution networks and the first gas meters were developed. Since the end of the 19th century, gas meters are under legal metrology control. The discovery of giant natural gas fields on the European continent in the second half of the past century forms the start of the international gas market that we know today. The gas value chain from production to consumption is schematically displayed in Figure 1 from the bottom to the top of the figure. With the energy transition towards more sustainable gases, the gas value chain applies also to other energy gases like biogas, biomethane, synthetic gases, synthetic biofuels, hydrogen, etc. This infrastructure is supported by wholesale and retail processes, manufacturing of gas equipment and appliances, research, and development, (legal) metrology and regulated by legislation and standards. The gas value chain is characterised by a multi-billion-euro operation in which, on a European level, hundreds of companies and organisations are active in the different supply chains. The capital-intensive nature of the gas value chain is the driver for a high level of services and high-quality products.

Gas is typically traded on an energy basis. So, at each of the custody transfer points, marked with arrows in Figure 1, measurements are performed to determine the quantity of gas and the gas composition from which the energy content of the gas is determined. In addition, many measurements are performed for quality assurance and quality control (QA/QC), process control purposes and to guarantee process safety. The NMIs and DIs in Europe provide traceability directly or via accredited laboratories to these custody transfer measurements.

The gas sector is also very well organised at a European level. Table I gives an overview of the European and global cooperation bodies that represent the different actors and their interests in the gas and supply chains.

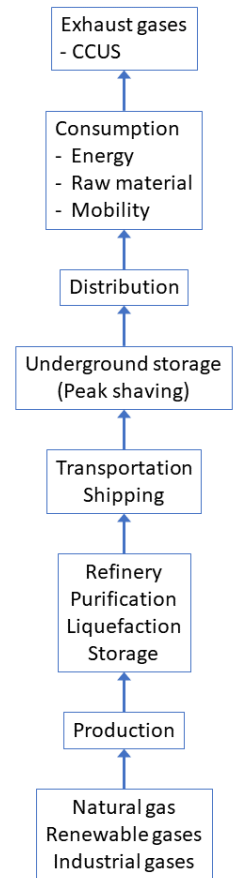


Figure 1: The gas value chain.

Table I: European and global cooperation bodies of organisations acting in different parts of the gas sector. The list is not exhaustive.

Link in the gas value chain	Organisations	Cooperation on EU level
Production, refinery, and sales	Oil & gas companies Producers of industrial gases	Eurogas <sup>1</sup> , EBA <sup>2</sup> , GasNaturally <sup>3</sup> EIGA <sup>4</sup> , Hydrogen Europe <sup>5</sup> , IGU <sup>6</sup>
Wholesale and retail		Eurogas, Fuels Europe <sup>7</sup> , IGU <sup>6</sup> , GasNaturally <sup>3</sup>
Pipeline transportation and storage (peak shaving)	Transmission System Operators	ENTSOG <sup>8</sup> , Marcogaz <sup>9</sup> , GIE <sup>10</sup> , IGU <sup>6</sup> , GasNaturally <sup>3</sup>
Gas distribution, metering, and billing	Distribution System Operators	Marcogaz <sup>9</sup> , Hydrogen Europe <sup>5</sup> , GasNaturally <sup>3</sup>
Research and development		GERG <sup>11</sup> , Hydrogen Europe <sup>5</sup> , EBA <sup>2</sup>
Standardisation	Standardisation bodies	CEN <sup>12</sup> , ISO <sup>13</sup> , national standardisation bodies
Gas equipment manufacturing	Manufacturers	Farecogaz <sup>14</sup>
Legislation	EC and national authorities	CEER <sup>15</sup>
Legal metrology	Countries (nat. authority)	WELMEC <sup>16</sup> , OIML <sup>17</sup>
Scientific and industrial metrology	Countries (nat. authority) NMIs & DIs	BIPM <sup>18</sup> EURAMET <sup>19</sup> TCs <sup>20,21,22</sup> and EMNs <sup>23</sup> , EuReGa <sup>24</sup>
Accreditation	National accreditation bodies	European Accreditation <sup>25</sup>

<sup>1</sup> Eurogas – <https://eurogas.org/>

<sup>2</sup> European Biogas Association (EBA) – <https://www.europeanbiogas.eu/>

<sup>3</sup> Gas Naturally – <https://gasnaturally.eu>

<sup>4</sup> EIGA – <https://eiga.eu/>

<sup>5</sup> Hydrogen Europe – <https://hydrogeneurope.eu/>

<sup>6</sup> International Gas Union (IGU) – <https://igu.org/>

<sup>7</sup> Fuels Europe – <https://www.fuelseurope.eu/>

<sup>8</sup> ENTSOG – <https://entsog.eu/>

<sup>9</sup> Marcogaz – <https://www.marcogaz.org/links/>

<sup>10</sup> GIE – <https://www.gie.eu/>

<sup>11</sup> GERG, Groupe Européen de Recherche Gazière – <https://gerg.eu>

<sup>12</sup> CEN – <https://www.cen.eu/Pages/default.aspx>

<sup>13</sup> ISO – <https://www.iso.org/>

<sup>14</sup> FARECOGAZ – <https://farecogaz.eu/>

<sup>15</sup> CEER – <https://www.ceer.eu/>

<sup>16</sup> WELMEC – <https://www.welmec.org/>

<sup>17</sup> OIML – <https://www.oiml.org/>

<sup>18</sup> BIPM – <https://www.bipm.org/>

<sup>19</sup> EURAMET – <https://www.euramet.org/>

<sup>20</sup> EURAMET TC Flow – <https://www.euramet.org/technical-committees/tc-f/>

<sup>21</sup> EURAMET TC Metrology in Chemistry – <https://www.euramet.org/technical-committees/tc-mc/>

<sup>22</sup> EURAMET TC Thermometry – <https://www.euramet.org/technical-committees/tc-t/>

<sup>23</sup> European Metrology Networks – <https://www.euramet.org/european-metrology-networks/>

<sup>24</sup> EuReGa, European Reference for Gas measurement – <https://tinyurl.com/yb3t2twy>

<sup>25</sup> EA, European Accreditation – <https://european-accreditation.org/>

## Decarbonisation and the role of energy gases

Although the Green Deal policy is accelerating the process of decarbonisation by targeting Europe to become climate neutral by 2050, the way towards this objective is still not certain. Despite this imponderability, metrology will play a crucial role in those sectors where decarbonisation is taking place.

The current challenge in the energy gas sector is to reduce greenhouse gas emissions and to replace fossil fuels with renewable energy sources. To this end new gases are introduced in the energy mix: hydrogen, biogas, biomethane, synthetic mixtures and hydrogen /natural-gas mixtures and any emerging renewable gaseous fuel. In particular, the industry is very active in developing roadmaps towards a hydrogen future [2], also using the existing infrastructure. In support to decarbonisation, CO<sub>2</sub> is captured then used (CCU) or injected in the underground (CCUS).

The classical metrological services are calibrations and reference materials for quantity of gas supplied, gas composition and combustion enthalpy (calorific value). In addition, the detection of impurities and contaminations of gases, humidity and temperature measurements as well as measurement of other thermodynamic properties such as density, speed of sound and Wobbe index, are within the expertise of the EMN members. However, the existing calibration and testing facilities are designed for natural gas and cannot automatically be transferred to hydrogen, hydrogen/natural-gas mixtures and carbon dioxide. In the absence of adequate facilities or infrastructure for these new gases the metrology institutes aim to cooperate with the industry. The objective is to expand the current service level to new gases and to new gas compositions. In addition, the scope will be broadened to applications of energy gases: heating, cogeneration, mobility, heavy industry, and raw materials. These issues have been identified as measurement needs in the strategic research agenda (SRA) [4] developed by this EMN, which will require close cooperation between metrologists from different disciplines. In particular:

- **Mobility & Transport:** sustainable and renewable fuels, such as hydrogen, are entering the mobility sector (vehicles and road transport). Accurate quantity and quality measurements are needed at hydrogen refuelling stations for fiscal purposes and to prevent damage of fuel cells as well as material testing studies for safety and for fuel cell technology improvement. Also in the maritime sector, where coming regulation will foresee the use of LNG and other less polluting fuels, it is expected that metrology will assist companies and organisations to demonstrate compliance with regulations.
- **Industry, heat and power:** R&D in support of new real-time measurement technologies and of new materials, as well as metrology for digitalisation will support technology innovation, process control and quality control at industrial level. For example, in chemical production and in the heavy industry, changes in the feedstock gases and fluctuations of the energy fuel to produce the base chemicals, steel or glass will impact the production process and the quality of the products. Also, the use of non-conventional energy gases in residential buildings will have an impact on the measurement of quantity delivered and therefore on the billing system.
- **Storage and CCUS:** storage of energy gases and carbon dioxide is aiming at balancing the offer and demand of energy as well as ensuring decrease of greenhouse gas emissions. Metrology services will be directed to ensure safe and reliable storage and utilisation, material compatibility (e.g. for corrosion protection), and leak detection.

## International cooperation on energy gases

The EMN for Energy Gases will seek to maintain and develop cooperation at all levels.

Following the main objectives for its creation (see § 0 for groups and main stakeholders), the main focus of the EMN is to cooperate with target stakeholders, from Industry and Public bodies to standardisation organisations (e.g. CEN, ISO). However, the EMN for Energy Gases will also prioritise cooperation with other organisations within or outside EURAMET. For instance, within EURAMET, the EMN Energy Gases has already initiated exchanges with the relevant TCs (Technical Committee) such as TC-Flow, TC-Chemistry and TC-Thermometry. Cooperation is also foreseen with others EMNs like the EMN on Clean Energy (e.g. on hydrogen generation by wind power) and with the EMN on MATHMET (to engage in artificial intelligence methods), and first discussions have been initiated.

Outside EURAMET, there are numerous associations in Europe that are focussing on specific topics other than those discussed at EURAMET, but which may have relevant links with Energy Gases. For instance, first discussions have already been conducted with “Hydrogen Europe”, an organisation that recently published its own Partnership programme, called “Partnership on Clean Hydrogen”.

The EMN for Energy Gases also intends to keep a regular cooperation with EUREGA, a consortium of metrology institutes which have demonstrated, in the area of high-pressure gas flow metering, that the uncertainty based on several traceability chains is lower than each of the partners would be able to achieve separately [3].

The legal metrology community is organised through WELMEC. At this moment well established contacts exist between members of the EURAMET TCs, the EMN for Energy Gases, and the legal metrology community.

## The need for an EMN for Energy Gases

We are facing an energy transition where new energy gases enter the market at an unprecedented pace. The challenge for the metrology community is to facilitate the transition and to be metrologically ready, when the industry, grid operators and regulatory bodies need traceability services for a decarbonised gas market.

The value of the EMN for Energy Gases consists of:

- Strengthening collaboration between EU NMIs/DIs. Here, the research capabilities can be joined – beyond the capacities of the individual metrology institutes – to assist the market with metrological research on existing, emerging and future renewable energy gases.
- Strengthening the link with stakeholders. There is an interest from the market in developments that could be profitable. For metrology institutes themselves it is vital to understand the logic of the gas value chain, its actors, suppliers, and end users. Only in this way it will be possible to develop adequate services. A well-established communication line with the industry is essential for this process. In addition, it is necessary to list the measurement capabilities of the institutes. The same holds for education.
- Prioritising the identified measurement needs and converting them into research projects.
- Achieving efficient use of resources and capabilities through cooperation with industry. The gas industry expects from the metrology institutes that they provide a reliable and robust measurement infrastructure (metrological traceability, reference materials, highly accurate measurement and testing methods). In addition, changes in legislation need to be feasible in practice. However, the resources to develop industry-scale calibration facilities and the



necessary level of expertise are beyond the financial possibilities of a single NMI/DI. Here, cooperation with the industry will be of mutual benefit.

## **Vision**

To enable all countries within Europe to access the measurement tools they require to support their energy gas industries including services, products, guidance, and expertise.

## **Mission**

To provide the world's leading Metrology Network comprising experts in the field of measurement science to drive forward innovation and to accelerate decarbonisation and emissions reductions within the energy gas industry in Europe.

## **Objectives**

The overall objective of the EMN for Energy Gases is to become the European metrology centre for the energy gas transition, where knowledge, needs and services are identified and easily accessible for the metrology community and the relevant stakeholders. Therefore, this Strategic Agenda (SA) has defined a suite of strategic objectives for the period 2021 – 2030 that will guide the set-up and operation of the EMN for Energy Gases.

### 1. A long-term ongoing dialogue with stakeholders

Engagement (liaisons and collaborations) is established with key European and international organisations, associations or technical committees involved in energy gases measurements and industry. This will involve development of a stakeholder mapping and prioritisation of key-stakeholders.

### 2. Technical and scientific solutions to support research and innovation

Development of a Strategic Research Agenda (SRA) [4], to be updated regularly, that identifies and priorities the measurement needs in the areas of energy gases / energy transition in the short- and long-term. Thanks to the SRA, the EMN will be able to address dedicated research together with, and focused on the direct needs, of industry and society. The SRA will serve for the preparation of orientation papers in support of the European Partnership on Metrology.

A key objective of the EMN for Energy Gases is to support the uptake of results from European metrology research activities related to energy gases (e.g. EMRP, EMPIR) for the benefit of energy gases stakeholders: industry, relevant policy makers and regulatory bodies. Dissemination of the results will be achieved by means of presentations and distribution of reports at relevant standardisation technical committee meetings, regular distribution of a newsletter, and organisation of stakeholder workshops.

A centralised coordination of the activities is the key to success. The EMN will enable better planning of new and realisation of initiated research activities based on cooperation between members and partners in the EMN, through formalised projects implemented within EURAMET (e.g. European Partnership on Metrology) and other EU research programs or through bilateral / multilateral agreements between partners in collaboration with industrial partners. The EMN will engage with EURAMET TCs and EMNs which are dealing, or have a possible link, with energy gases and energy transition.

### 3. Web-based measurement services platform

A freely accessible online measurement service platform will be developed. This platform will boost the dissemination and knowledge transfer of metrological services in the energy gases field to European industry. This will allow stakeholders and customers to access all available energy gases measurement services in Europe through one easy-to-use platform. The platform will advertise all measurement and calibration services, including those developed in the EMRP and EMPIR Programmes. This platform may be expanded with an overview of the present training courses on metrology for energy gases, that are available from metrology institutes and stakeholders.

The measurement service platform also aims at building synergies and creating collaborative activities between EMN members mutually, and additionally with external parties (other NMIs/DIs, associations, industry). In this way standing and emerging needs, such as complex measurement services, which are not within the capability of one single organisation, can be promptly developed and offered. Examples may include the provision of joint measurement and calibration services, proficiency testing schemes and scientific expertise in support of energy trade, conformity assessment and laboratory accreditation.

### 4. Training and Knowledge Centre

Before the centre can start, an inventory needs to be compiled of available training courses already offered by the NMIs, DIs, stakeholders, European and global organisations. Training courses are a strategic activity.

The realisation of a Training & Knowledge Centre for metrology for energy gases will ensure dissemination of metrological and scientific knowledge and the long-term dialogue with stakeholders and end-users. This centre will focus on organisation of workshops, seminars, guidelines and training programmes and it will bring together the organisations with the necessary expertise and parties requesting the services. This centre will also create a bridge that conveys knowledge and technology transfer to and from universities, research organisations, testing laboratories and large end users dealing with metrological issues in energy gases. The Training & Knowledge Centre will also help bringing metrology to the field, by providing public information in the form of articles in technical journals, presentations in ad-hoc conferences and communications and news disseminated through the EMN website.

## Values

We, members of the EMN for Energy Gases, care for a liveable environment for ourselves and for future generations.

Our values are:

- Measurements shall be traceable and as accurate as necessary and reasonably achievable.
- We are objective, which means that the result of our work is independent from financial and political interests.
- We contribute to regulations, standards and procedures in such a way that they will work in practice.
- We transfer knowledge and the results of our research to the stakeholders of our work.

Our passion is metrology: it is our attitude towards life.

## **Sustainability and efficient use of the resources**

The EMN for Energy Gases is to become a structure that will be self-sustaining and operate independently from targeted EU funding. Ideally, EMN funding will consist of two third from national sources, which is necessary to maintain and update the national metrology infrastructure. One third is aimed to be funded by a mix of European metrology research, Horizon Europe, European Agencies, partnership programmes and cooperation projects with the industry. The following sections give an overview of both funding practises and funding opportunities.

### **The fast track**

The developments in the hydrogen infrastructure progress at a rapid pace. Industry is investigating if existing products and services can be applied for hydrogen applications, and problems need to be solved on the short term. In this case the industry directly approaches partners that can supply high-level services on a relative short notice. For this type of work a consortium of metrological institutes is not a suitable partner as the negotiations will take too much time. The EMN for Energy Gases members will engage in these type of projects if the opportunity arises. A successful project may be the prelude to structural cooperation with industry partners.

### **Long-term structural development**

In the first four years of this EMN's lifetime (2019-2023), funding is provided by the EMPIR project JNP 18NET01 which supports and accelerates the development and full implementation of the EMN for Energy Gases. After this initial phase of development, the participating institutes will financially secure the organisational sustainability of the EMN. Up to the end of the European Partnership on Metrology (2030), EU funding to joint research projects will still be available. In that period robust infrastructures need to be in place that can attract funding from diverse sources and make the EMN self-sustaining. This requires the above-mentioned development of long-term cooperation and interaction with stakeholders in priority areas and prepare the EMN members to meet their stakeholder needs. This creates incentives for NMIs/DIs and externals to get involved with the EMN and, if applicable, to agree on membership fees. It is key that the management staff of the NMIs/DIs members of the EMN is actively involved in the EMN strategic and progress activities because this will ensure alignment of the EMN with national institute strategies and guarantee smooth development of the network. Additionally, the EMN for Energy Gases will be sustainable by the commitment of in-kind contributions of the members and partners and will be supported by the EURAMET Secretariat on legal matters, accountancy and some aspects of communication, networking, and dissemination.

The shared knowledge between the EMN members and partners obtained through the mapping of capabilities and services will be used as the basis for supporting the EURAMET TCs in their development of strategies for capacity building and potential smart specialisation, in particular, in the development of novel capabilities and services filling identified gaps. Key steps towards a joint and sustainable European metrology research infrastructure for renewable energy gases will be continuously discussed and identified within the EMN's General Meeting consisting of NMIs/Dis, and advice will also be sought from the EMN's Stakeholder Council, EURAMET TCs and other relevant bodies. Triggering such a virtuous process leads also to support for the TCs in the identification of those countries interested in smart specialisation and NMIs/DIs willing or needing to develop new capabilities.

Finally, the EMN for Energy Gases will also establish liaisons with industry and EU partnerships, which will give access to future projects.

## Engagement with other partnerships

The recent co-operation with Hydrogen Europe and Hydrogen Europe Research in the Clean Hydrogen Partnership is an example of the co-operation with other partnerships, which have similar funding procedures as EURAMET. A brainstorming session held at the begin of 2022 showed that there a match between industrial measurement needs and potential metrological solutions offered by the EMN members EURAMET, and specifically the EMN for Energy Gases, has become Stakeholder Group member of the Clean Hydrogen Partnership (Joint Undertaking) with the role of providing feed-back on their research program and of initiating synergies.

## Other sources

Horizon Europe funds different types of collaborative projects including “Coordination and support action” (CSA) that improve cooperation among EU and associated countries to strengthen the European Research Area including, for example, standardisation, dissemination, awareness-raising, communication and networking activities, policy dialogues, mutual learning or studies. The EU funding covers up to 100% of the project costs. This EMN will explore the possibility to initiate a CSA.

Finally, in some European countries, national subsidy pools are available for funding research. These can be a useful addition to the funding possibilities described above.

## References

- [1] EURAMET (2021): EURAMET 2030 Strategy, <https://www.euramet.org/research-innovation/sra>
- [2] Clean Hydrogen Partnership: Strategic Research and Innovation Agenda, [https://www.clean-hydrogen.europa.eu/about-us/key-documents/strategic-research-and-innovation-agenda\\_en](https://www.clean-hydrogen.europa.eu/about-us/key-documents/strategic-research-and-innovation-agenda_en)
- [3] Jos van der Grinten, Henri Foulon, Arnthor Gunnarsson, Bodo Mickan (2018): Reducing measurement uncertainties of high-pressure gas flow calibrations by using reference values based on multiple independent traceability chains, *Technisches Messen*, Vol. 85(12), pp 754-763, <https://doi.org/10.1515/teme-2018-0019>
- [4] EMN for Energy Gases (2022): Strategic Research Agenda, Version 2.0 (09/2022), <https://www.euramet.org/european-metrology-networks/energy-gases/strategy>

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