

ACTION PLAN

MEASURES FOR THE SUCCESSFUL
IMPLEMENTATION

OF THE NATIONAL
HYDROGEN STRATEGY
UP TO 2026



MINISTRY
OF ECONOMY
OF THE SLOVAK REPUBLIC

The action plan for the successful implementation of the National Hydrogen Strategy up to 2026 (hereinafter "Action Plan") will create conditions for the implementation of hydrogen technologies in line with the National Hydrogen Strategy "Ready for the Future"¹.

The Government of the Slovak Republic has committed to creating conditions to achieve climate neutrality by 2050, as defined in the National Hydrogen Strategy "Ready for the Future". Measures defined in the Action Plan are proposed to meet the strategy's goals and will facilitate investments in the economically sustainable value chain of renewable and low-carbon hydrogen², i.e. in its production, transport, distribution, storage, and use in industry, energy, and transport, especially where direct electrification is not possible, or will be cost-ineffective. This will support research and development, international cooperation, and marketing. The proposed measures will be implemented under the competence of the Ministry of Economy of the Slovak Republic and other ministries stated in the government resolution proposal. The cooperating organisations and institutions stated for each measure will participate in their implementation.

The Action Plan has been created for the implementation of measures from 2023 to 2026 with a total funding of EUR 59.6 million, for which available funds have been identified. After evaluating the implementation of the Action Plan from 2023 to 2026, an update will be elaborated for the 2027 to 2030 period.

The Action Plan defines measures and goals to be achieved by their implementation, deadlines for implementation, the responsible and cooperating ministries, and relevant institutions and organisations of the state and public sector. Estimated costs are quantified for the measures, including possible funding sources (provided the requirements in the relevant call / scheme are met), and the indicators for assessing their effective fulfilment are given.

The Action Plan includes available funding sources for individual measures - Annex No. 2. The timeline is proposed in Annex No. 3.

Targets for hydrogen production and consumption for 2030 will be analysed and quantified within Measure 1. Implementing this measure will create the prerequisites for the second phase of the Action Plan implementation. The financing method and the estimated costs of implementing measures will be clarified in chapters B and C of the second stage of the Action Plan. In 2025, the Action Plan will be updated to take into account significant changes to the policy of the Slovak Republic and the EU and any revision of the Integrated National Energy and Climate Plan for the years 2021 – 2030.

In the text of the Action Plan, the term "hydrogen" means renewable and low-carbon hydrogen, unless stated otherwise.

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¹ Resolution of the Government of the Slovak Republic No. 356 from 23 June 2021, <https://rokovania.gov.sk/RVL/Resolution/19331/1>

² A comparative table for definitions of types of hydrogen between the National Hydrogen Strategy and terms used in the Action Plan is provided in Annex No. 1.

CONTENTS OF MEASURES IN THE FIRST PHASE OF THE ACTION PLAN UP TO 2026

List of abbreviations	4
A: HYDROGEN MISSION FOR A CLIMATE-NEUTRAL SLOVAKIA	5
Measure 1	5
Measure 2	7
Measure 3	7
8B: HYDROGEN VALUE CHAIN	8
Measure 4	9
Measure 5	10
Measure 6	11
C: RESEARCH AND DEVELOPMENT TASKS	11
Measure 7	12
Measure 8	13
Measure 9	13
Measure 10	14
Annex 1 - Comparison Table of Definitions of Different Types of Hydrogen	14
Annex 2 – EU Financial Supporting Measures for Hydrogen Technologies	15
Annex 3 - Schedule for the Implementation of Measures	17

List of used abbreviations used

Abbreviation

APVV	Slovak Research and Development Support Agency
CEF	Connecting Europe Facility (European Union's tool for connecting Europe - a community program)
CNIC	Cassovia New Industry Cluster (Košice New Industry Cluster)
CO₂	Carbon Dioxide
CO₂ eq	Carbon Dioxide Equivalent (comparative equivalent of greenhouse gases)
CVVT	Hydrogen Technology Research Centre
EIA	Environmental Impact Assessment
EIT	European Institute of Innovation and Technology
EU	European Union
EC	European Commission
IPCEI	Important Projects of Common European Interest
IPKZ	Integrated Pollution Prevention and Control
MD SR	Ministry of Transport of the Slovak Republic
MF SR	Ministry of Finance of the Slovak Republic
MH SR	Ministry of Economy of the Slovak Republic
MIRRI SR	Ministry of Investments, Regional Development and Informatization of the Slovak Republic
MPSVaR SR	Ministry of Labour, Social Affairs and Family of the Slovak Republic
MŠVVŠ SR	Ministry of Education, Science, Research and Sport of the Slovak Republic
MV SR	Ministry of Interior of the Slovak Republic
MZVEZ SR	Ministry of Foreign and European Affairs of the Slovak Republic
MŽP SR	Ministry of Environment of the Slovak Republic
NVAS	Slovak National Hydrogen Association
NVS	National Hydrogen Strategy
OZE	Renewable Energy Sources
POO	Recovery and Resilience Plan of the Slovak Republic
SARIO	Slovak Investment and Trade Development Agency
SAV	Slovak Academy of Sciences
SBA	Slovak Business Agency
SEPS	Slovak Electricity Transmission System Operator
SMÚ	Slovak Metrology Institute
SHMÚ	Slovak Hydrometeorological Institute
SIEA	Slovak Innovation and Energy Agency
SK RIS3	Research and Innovation Strategy for Smart Specialization 2021+ of the Slovak Republic 2021-2027
SR	Slovak Republic
STN	Slovak Technical Standards
ÚNMS SR	Slovak Office of Standards, Metrology and Testing
ÚRSO	Regulatory Office for Network Industries

A: HYDROGEN MISSION FOR A CLIMATE-NEUTRAL SLOVAKIA

The National Hydrogen Strategy "Ready for the Future" (NVS)³ defines the strategic role of the state in facilitating the use of hydrogen technologies in the Slovak Republic (SR) in the context of current developments in the European Union. The goal of the NVS is to increase the competitiveness of the Slovak economy and significantly contribute to climate neutrality by 2050 in accordance with the European Green Deal, to which Slovakia has committed. By 2030, the EU has set a target to reduce greenhouse gas emissions by 55% compared to 1990. To implement government policies, the Slovak government will establish a legislative framework and a set of technical documents to implement hydrogen technologies. The development of legislative proposals will draw upon the experiences of countries where hydrogen technologies are part of their economic systems.

Measure 1 Roadmap for Hydrogen Decarbonization of Slovakia

The priorities for developing the national hydrogen ecosystem will be based on experience from pilot European projects, hydrogen production balance scenarios, hydrogen consumption, and hydrogen import and export balances within the global hydrogen transport network, considering the needs of energy, relevant industrial sectors, and the transport sector until 2030, with an outlook to 2050. The objectives of the NVS by 2030, with an outlook to 2050, will also be considered. The basis for compiling development priorities will be the elaboration of a comparative analysis of individual areas of hydrogen production and application compared to other decarbonization methods and an update of the list of hydrogen technology users within the interdepartmental working group. Emphasis will be placed on the efficiency of future investments from public funds and the sustainable operation of the renewable and low-carbon hydrogen ecosystem as part of initiatives to achieve Slovakia's climate neutrality by 2050. Based on the analysis, long-term development areas for the hydrogen ecosystem will be defined.

Goal: Define priorities and the trajectory of the development of the hydrogen ecosystem for the decarbonization using hydrogen for relevant sectors of Slovak society and its economy based on the quadruple helix principle⁴.

Deadline: 4Q 2023

Responsible: Ministry of Economy of the Slovak Republic (MH SR)

Collaborating Institutions: SIEA, MD SR, MŽP SR, MIRRI SR, SHMÚ, CVVT, MŠVVŠ SR, MZVEZ SR, NVAS, municipalities, employers and professional organisations, universities, SAV

Financial allocation: EUR 250,000

Sources of funding: Recovery and Resilience Plan (REPowerEU – Component 19 POO, Area 1: Energy and Permitting Processes, Reform 2: Support for the green transformation in the field of RES, Partial Measure 2: Action Plan of the National Hydrogen Strategy of the Slovak Republic

³ The NHS (National Hydrogen Strategy) is available for download at: https://www.nvas.sk/NVS_EN.pdf

⁴ The Quadruple Helix model is an innovation system that involves four sets of stakeholders: academia, industry, government, and civil society. The interaction and collaboration between these four sectors is intended to drive innovation and economic growth.

Indicator of successful implementation: Development of a roadmap, setting priorities, national goals, and the budget until 2030 with a view to 2050.

National Project "Improvement of Public Policies, Innovation Capacity, Communication and Partnership Support in the Use of Hydrogen in Slovakia"

The preparation and development of public policies and tools for the development of hydrogen use requires the legal framework, the securing of funds and support for research and development activities within the hydrogen chain. Implementation and its coordination will be provided by a national project based on the NVS. The national project "Improvement of public policies, innovation capacity, communication and partnership support as regards the use of hydrogen in Slovakia" ("National Project") will accelerate the fulfilment of the NVS mission by financing and implementing non-investment measures of the Action Plan⁵. A communication campaign to increase public acceptance of hydrogen will have a wide social effect by showing new carbon-less technologies as the green agenda that is close to everyday life and use of the general public and support interest in study fields of benefit to the hydrogen ecosystem. It will motivate the public to use hydrogen solutions, facilitate development of the hydrogen ecosystem, and the production of hydrogen technologies in Slovakia. For the efficient management of the implementation of the NVS and its Action Plan, a professional coordination unit for hydrogen technologies of Slovakia is being established at the Ministry of Economy of the Slovak Republic (MH SR). The workplace, in cooperation with the institutions under the ministry which will support the development of the main technologies, will coordinate and monitor the implementation of measures and support the development of hydrogen technologies across the value chain. These activities will spur the creation and development of hydrogen valleys⁶ in Slovak regions.

Goal: Create conditions to support the creation and implementation of industrial policies for the development of hydrogen technologies, fulfilment of the NVS mission and increase the competitiveness of companies in Slovakia as regards the application of hydrogen technologies in industry, energy, and transport. This will identify available state and European supporting tools in detail, and create funding schemes for individual measures in chapters B and C, with a focus on pilot projects. Project activities will promote Slovakia as a reliable partner country actively using hydrogen technologies in its economic transformation processes, with the goal of climate neutrality by 2050. The project will develop and implement communication strategies for Slovakia regarding hydrogen technology to accelerate the acceptance of their introduction into society. Project activities will create a positive image of Slovakia as a country heading towards climate neutrality and ensure the management of the development of hydrogen technologies in Slovakia and communication with partners abroad.

Deadline: 2024 and ongoing until 2029

Responsible: SIEA

Collaborating Institutions: NVAS, MŽP SR, MDV SR, MIRRI SR, SIEA, SARIO, MŠVVŠ SR, MZVEZ SR, local governments, CVVT

Financial allocation: EUR 25.947 million

Sources of funding: Slovakia Program - details of financing will be fine-tuned in the revision of the PSK for 2023, by 3Q 2023.

Indicator of successful implementation: Realisation of the National Project.

⁵ The development of analyses, studies, legislative and regulatory proposals, standards, and education programs. Implementation of communication and marketing activities. Risk management and activities related to connecting stakeholders.

⁶ Hydrogen valleys are regions where a comprehensive supply-consumer chain forms part of regional development plans. Hydrogen valleys in the EU: <https://www.fch.europa.eu/page/mission-innovation-hydrogen-valleys-platform>.

Creation and amendment of legislation, regulatory environment, technical and safety standards for hydrogen technologies

Elaboration of an analysis of current European and national binding and non-binding legislation⁷, preparation of legislative intentions, and amendment of the regulatory environment, which will support the development of the use of hydrogen technologies. Identify and analyse all legal regulations relevant to the permission process for hydrogen technologies (EIA, integrated permission processes, spatial planning, building permit process, etc.) for the creation of legislative measures that significantly simplify permission processes for hydrogen technologies. Definition and implementation of measures for the creation and adoption of Slovak technical standards in line with NVS priorities and based on suggestions from stakeholders (business entities, the public, technical commission).

Goal: Based on experience of the use of hydrogen technologies from EU countries, develop legislative proposals for the approval of the relevant legislation for the application of hydrogen technologies in Slovakia in line with EC legislation adoption requirements and specified priorities. Develop and approve legislative intentions to simplify permission processes for hydrogen technologies⁸. Adopt European standards into Slovak Technical Standards (STN) and, if necessary, propose new STNs based on suggestions from stakeholders.

Deadline: 2024

Responsible: MH SR (Ministry of Economy of the Slovak Republic)

Collaborating Institutions: Slovak Office of Standards, Metrology and Testing (ÚNMS), MD SR, MŽP SR, MIRRI SR, MV SR, MS SR, Office of the Deputy Prime Minister of the Slovak Republic for Legislation, NVAS, universities, employers' and professional associations and organisations

Financial allocation: EUR 287,825 (MH SR), EUR 120,000 (ÚNMS)

Sources of funding: Recovery and Resilience Plan (REPowerEU - Component 19 RRP, Area 1: Energy and Permission Processes, Reform 2: Support for Green Transformation in the OZE area, Submeasure 2: Action Plan of the National Hydrogen Strategy of the Slovak Republic)

Indicator of successful implementation: Elaboration and approval of legislative and non-legislative norms, amendment of the regulatory environment, and adoption of European technical norms and standards into STN

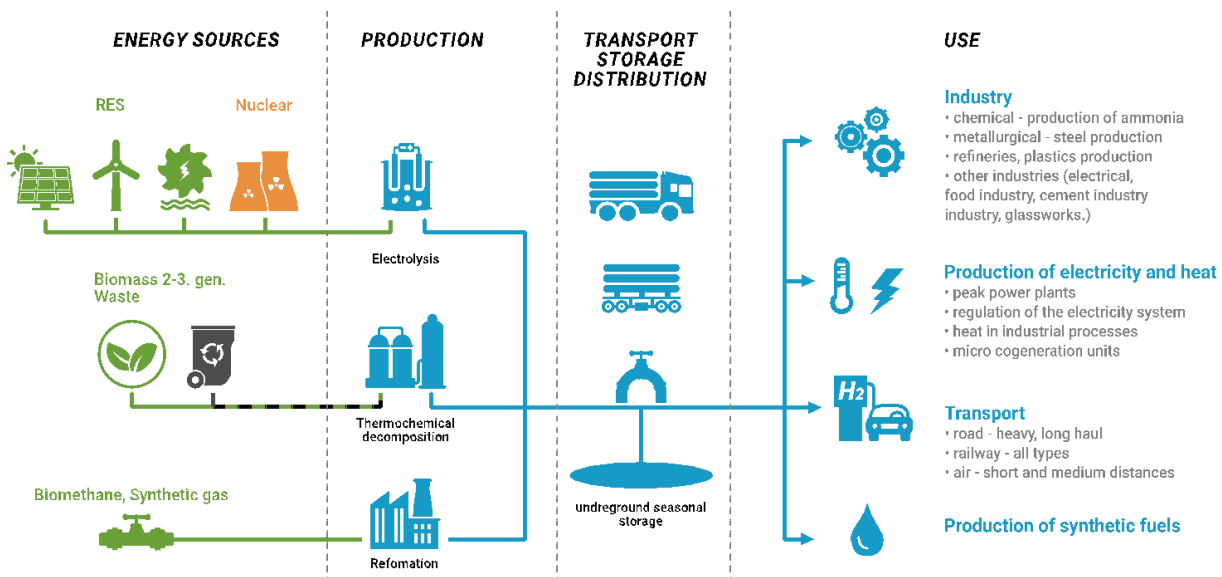
⁷ For example, technical standards.

⁸ EIA, planning procedure, building permit process.

B: HYDROGEN VALUE CHAIN

The European Green Deal is the European Commission's plan for a green transformation of the EU's economy to ensure a sustainable future and includes hydrogen technologies as one of the tools for achieving the EU's climate goals. A comprehensive hydrogen value chain (Figure 1) will emerge in the best-prepared regions of Slovakia, in the form of pilot projects that include important projects of common European interest (IPCEI). The chain will consist of hydrogen production facilities, distribution and storage capacities and end applications in industry, energy, and transport.

Figure 1: Hydrogen value chain in Slovakia by 2030, source: National Hydrogen Association of Slovakia (NVAS)



Measure 4

Support for Important Projects of Common European Interest (IPCEI)

Preparation and implementation of a support scheme to co-finance the research-development-innovation phase and the first industrial deployment phase (or its part) of IPCEI projects (Important Projects of Common European Interest)⁹ in the field of hydrogen technologies implementation.

Goal: To implement selected IPCEI projects in priority areas of hydrogen ecosystem development in the Slovak Republic.

Timeline: 2023 – 2026

Responsible: MH SR (Ministry of Economy of the Slovak Republic)

Financial allocation: EUR 12.2 million

Sources of funding: Recovery and Resilience Plan (Component 9, Investment 4)

Indicator of successful implementation: Realisation of hydrogen IPCEI projects

⁹ https://ec.europa.eu/growth/industry/strategy/hydrogen/ipceis-hydrogen_en

Support for Pilot Projects of the Hydrogen Ecosystem

Pilot projects will be implemented based on the outcomes of the Hydrogen Decarbonization Roadmap of Slovakia (Measure No. 1). Financial support for the preparation and implementation of pilot projects for hydrogen production, and utilisation will focus on emerging hydrogen valleys and integrated hydrogen supply-consumption chains. The primary goal of financial support is to aid the development of research, metrological coverage, and the testing of pilot project operations.

Goal: Implement the first production and consumption capacities as regards renewable and low-carbon hydrogen and generate detailed knowledge to be applied to the simple and rapid installation of hydrogen clusters with the required metrological provisions. Verification of the effectiveness of a hydrogen production system close to the consumption site, utilising new and existing RES capacities, using electricity networks to demonstrate the abilities of an electrolyser to regulate the transmission system. The implementation of pilot projects will focus on the use of hydrogen in industry, energy, and transport, especially in the hydrogen valleys.

Timeline: 2023 – 2026

Responsible: MH SR

Collaborating institutions: MŽP SR, Government Office of the SR, NVAS, universities, SAV, local and foreign industrial partners

Financial allocation: EUR 17.8 million from EU funds - Program Slovakia - National Project and EUR 15 million from the RRP

Financing sources: EU Funds - Program Slovakia - National Project (Measure No. 2), Recovery and Resilience Plan (Component 1, Investment 3: Increasing the flexibility of power systems for higher RES integration)

Success indicator: Implementation of the first production capacities for renewable and low-carbon hydrogen and its use in industry, energy, and transport in a volume of at least 1,200 tonnes in 2027, provided that projects are implemented by the end of 2026. Specific indicators will be determined based on the priorities of the Hydrogen Decarbonization Roadmap of Slovakia (Measure No. 1).

Infrastructure for Hydrogen Use in Transport

This measure will support the construction of basic infrastructure in the regions of the Slovak Republic (SR) via specific financial schemes. Refuelling stations and fuel systems will be located based on an analysis of hydrogen requirements for fleets of hydrogen vehicles and mobile technology on major transport routes, operations at urban nodes and airports, and in the hydrogen valleys.

Within the pilot phase of building hydrogen infrastructure, the Action Plan anticipates the establishment of at least three hydrogen refuelling stations by 2026. The stated investment will be financed via the approved Aid Scheme from the Recovery and Resilience Plan funds within Component 3 and is in line with the accepted milestones and objectives of supporting infrastructure construction for alternative fuels¹⁰.

In terms of project eligibility, localities with available infrastructure and renewable hydrogen production capacity will be preferred, ideally at urban nodes and in transit corridors for public personal and heavy freight transport.

Goal: To build a network of refuelling infrastructure to ensure the operation of mobile technology with hydrogen propulsion.

Timeline: 2023 – 2026

Responsible: MH SR

Collaborating institutions: MD SR, MIRRI SR, ÚNMS SR, MO SR, SIEA, SAV, private research and development institutions, universities

Financial allocation: EUR 3 million

Funding sources: Recovery and Resilience Plan, (Component 3, Investment 4)

Success indicator: Commissioning of three fixed 350/700 bar refuelling stations by the end of 2026.

¹⁰ <https://www.mhsr.sk/podpora-investicii/plan-obnovy/dokumenty>

C: RESEARCH AND DEVELOPMENT TASKS

Research and development associated with innovations and education in the field of hydrogen technologies will be one of the strategic areas of the energy and industrial policy of the SR.

Measure 7 **Hydrogen Technology Research Centre in Kosice**

Support the activity of the Hydrogen Technology Research Centre in Kosice (CVVT) with its own legal entity based on cooperation of the Technical University in Kosice, Pavol Jozef Šafárik University in Kosice, with the Slovak Academy of Sciences (SAV), as a national institution. The CVVT will grant membership in its structures to all stakeholder academic and research institutions from the private and public sector, and representatives of the relevant industrial sectors in the SR and abroad, to facilitate cooperation with CNIC¹¹, ICKK¹², and the European network EIT InnoEnergy¹³, and other initiatives. In the first stage, a priority will be a comparative study of hydrogen production methods, transport and distribution with a proposal for optimal procedures in the Slovak Republic. The Ministry of Education, Science, Research and Sport of the Slovak Republic (MŠVVŠ SR) will prepare a project proposal at the Research and Development Support Agency (APVV) to support hydrogen technologies for the government of the SR.

Goal: Provide support for the implementation of basic, applied research and development as an incubator of new solutions within the development of hydrogen technologies. Increase investments in research, development, and commercialisation of green hydrogen technologies by participating in key EU initiatives and programs. Provision of project support for the involvement of Slovak entities in EU community programs¹⁴ via the CVVT project office.

Timeline: 2023 – 2026

Responsible: MŠVVŠ SR

Collaborating institutions: MH SR, SAV, MZVEZ SR, Government Office of the SR, SIEA, NVAS, ÚNMS SR, SAV, ÚNMS SR, higher education institutions and universities, private research and development institutions

Financial allocation: EUR 800,000

Funding sources: State budget of MŠVVŠ SR - APVV

Success indicator: At least 2 successfully implemented projects.

¹¹ Cassovia New Industry Cluster

¹² Innovation Centre of the Košice Region.

¹³ [EIT InnoEnergy](#) is a pioneer on the path to a decarbonised Europe by 2050, leading three industrial alliances: battery storage, renewable hydrogen, and solar photovoltaics.

¹⁴ For example, the Connecting Europe Facility (CEF) is an instrument for connecting Europe – a communitarian program of the European Union, or alternatively, Horizon Europe.

Measure 8

Education and Knowledge Transfer

Support for the transfer of knowledge about hydrogen, hydrogen technologies, the use of hydrogen, and its contribution to the environment in educational and study programs in vocational education at secondary and tertiary levels, and within the dual and lifelong learning system.

Goal: Support education at secondary and vocational schools as regards the hydrogen economy. Motivate higher education institutions to create undergraduate and postgraduate study programs in hydrogen technologies, including equipment for these study programs. Create a lifelong learning program for this area. Deepen the international transfer of knowledge and experience.

Timeline: 2024 – 2026

Responsible: MŠVVŠ SR

Collaborating institutions: MPSVR SR, MH SR, MŽP SR, MO SR, EC representation in SR, NVAS, higher education institutions and universities, employers, and professional organisations, CVVT, SAV, municipalities, lifelong learning institutions, clusters, associations of legal entities

Financial allocation: EUR 1.5 million from EU funds - Slovakia Program - National Project and from POO

Funding sources: EU funds - Slovakia Program - National Project (Measure No. 2), Recovery and Resilience Plan - REPowerEU

Success indicator: Creation of study programs and courses in vocational education specialising in hydrogen technologies. Knowledge and experience transfer.

Measure 9

Safety of Hydrogen Technologies as Part of Research Activities

There are specific risks with regard to the characteristics of hydrogen as regards the practical applications of hydrogen technologies. As in other countries, these characteristics require a specific approach to minimising risks in the hydrogen chain as part of an integrated safety management system in collaboration with research institutions abroad. MŠVVŠ SR will prepare a support scheme for projects in the field of the safety of hydrogen technologies at the APVV.

Goal: Create a support program for risk management within the hydrogen chain under the management of applied research in the SR

Timeline: 2024 – 2026

Responsible: MŠVVŠ SR

Collaborating institutions: MH SR, MV, MŽP SR, MZ SR, MPSVR SR, MD SR, ÚNMS SR, SMÚ, NVAS, universities, SAV, private research institutions

Financial allocation: MŠVVŠ SR state budget - APVV

Amount of funds: EUR 500,000

Success indicator: At least 2 successfully implemented projects.

Measure 10

Support for Start-ups and Spin-off Companies

Create a motivational environment for the emergence of new entrepreneurial activities within the hydrogen value chain¹⁵. Provide advisory, administrative services, and ecosystem for emerging start-ups at the coordination centres in the hydrogen valleys.

Goal: Implement innovative entrepreneurial intentions via start-ups¹⁶ and spin-offs¹⁷ by partnering with industrial partners.

Timeline: 2024 – 2026 and continuously until 2030

Responsible: MH SR

Collaborating institutions: Slovak Investments Holding, MŠVVŠ SR, Government Office SR, NVAS, higher education institutions and universities, SAV, private research institutions, municipalities, clusters and associations of legal entities

Financial allocation: EUR 1.5 million

Funding sources: MH SR state budget - SBA, a competitive call for proposals

Success indicator: Number of created start-ups and spin-off companies in the hydrogen ecosystem. Specific indicators will be set based on the priorities of the hydrogen decarbonization roadmap of Slovakia (Measure No. 1)

¹⁵ By supporting the creation of Proof-Of-Concept solutions.

¹⁶ A start-up is a new project or a newly established company, often still in the stage of creating a business plan. It is characterised by innovation, scalability, and multiple potential return on investment.

¹⁷ A spin-off is a business company separated from the parent entity with the goal of commercialising new knowledge (or an invention, discovery, etc.), primarily in the field of research.

Annex 1 - Comparison Table of Definitions of Different Types of Hydrogen

Terms used in the National Hydrogen Strategy	Terms used in the Action Plan
<p>Green Hydrogen is hydrogen produced by water electrolysis using an electrolyser, powered by electricity from renewable energy sources. Greenhouse gas emissions during the entire life cycle of renewable energy production are close to zero.</p>	<p>Renewable hydrogen of non-biological origin is hydrogen produced by electrolysis from electricity obtained from renewable non-biological sources, such as solar, wind, water, and geothermal energy. Renewable hydrogen of biological origin only contributes to achieving energy and climate goals if it is produced using truly sustainable raw materials, such as the waste and residues stated in Annex IX Part A of Directive (EU) 2018/2001 of the European Parliament and the Council¹⁸.</p>
<p>Blue Hydrogen is hydrogen produced from fossil fuels with CO₂ capture, nuclear energy sources, and waste, where greenhouse gas emissions are significantly lower (by more than 70%) than grey hydrogen produced from fossil fuels.</p>	<p>Low-carbon hydrogen is hydrogen produced from non-renewable sources, such as nuclear sources or from waste, which meets the threshold value of reducing greenhouse gas emissions by 70% compared to a comparable fossil fuel EF(t) stated in Annex V of Directive (EU) 2018/2001¹⁹.</p>
<p>Grey Hydrogen is hydrogen produced by processes using fossil fuels as the raw material (natural gas, coal gasification). Greenhouse gas emissions during the life cycle of fossil fuel production are high.</p>	<p>Fossil-based Hydrogen is hydrogen produced using various processes using fossil fuels as the raw material, particularly natural gas reforming or coal gasification. It is the hydrogen most commonly produced today. Greenhouse gas emissions during the life cycle of fossil hydrogen production are higher than 70% compared to a comparable fossil fuel EF(t).</p>

¹⁸ Directive of the European Parliament and the Council (EU) 2018/2001 of 11 December 2018, on the promotion of the use of energy from renewable sources (OJ EU L 328, 21.12.2018, p. 82).

¹⁹ The comparable fossil fuel has 94 g CO₂ eq/MJ.

Annex 2 – EU Financial Supporting Measures for Hydrogen Technologies

Recovery and Resilience Facility

This is the centrepiece of Europe's recovery plan - The Next Generation EU. Its aim is to mitigate the economic and social impact of the COVID-19 crisis and help EU economies and societies become sustainable, resilient, and better prepared for the challenges and opportunities of the green and digital transition.

Horizon Europe

Over a 7-year period, more than 1 billion euros will be invested in hydrogen-related research and innovation under Horizon Europe. Currently, there are three hydrogen-related calls ongoing, and one being prepared²⁰. A total of 12 calls have already been concluded. From 2022, further hydrogen-related calls will be published.

Clean Hydrogen JU (formerly FCH JU)

Link to the project website section with detailed information on fund and financing opportunities²¹.

European Regional Development, Cohesion Fund, REACT-EU

The European Regional Development Fund and the Cohesion Fund are part of the EU Cohesion Policy funds. These funds represent nearly one-third of the total budget of the Multiannual Financial Framework for 2021 - 2027. They will support innovation and entrepreneurial activity during the transition to a climate-neutral economy. REACT-EU provides additional funds to the European Regional Development Fund.

Just Transition Fund

This is a new EU cohesion policy fund which will support the reduction of social and economic costs of the transformation process required to meet the Union's energy and climate goals by 2030 and to achieve a climate-neutral economy in the Union by 2050. The fund focuses on the regions most affected by transformation impacts due to their dependence on fossil fuels, including coal or emission-intensive industrial processes producing pollutants affecting air quality.

Invest EU

²⁰ Horizon Europe – [Funding and tenders](#)

²¹ https://www.clean-hydrogen.europa.eu/apply-funding_en

A budget guarantee fund that simplifies access to financing for riskier commercial projects and steering private investments. It manages four main policy areas: sustainable infrastructure; research, innovation, and digitisation; small and medium-sized enterprises and social investment and skills.

Innovation Fund

The Innovation Fund is one of the world's largest funding programs for the demonstration of innovative low-carbon technologies. This is not a research program, but rather its goal is to bring highly innovative technologies to market (commercial demonstration projects).

Modernisation Fund

A special program to support the ten lowest-income EU countries in their transition to climate neutrality by assisting in the modernisation of their energy systems and improving energy efficiency by supporting investment in storage, production and the use of renewable energy sources and modernising energy networks.

Connecting Europe Facility – Energy

A key EU financing instrument for targeted infrastructure investments at European level. It supports the implementation of the Trans-European Energy Networks (TEN-E) Directive - a policy framework aimed at connecting the energy infrastructure of EU countries.

Connecting Europe Facility – Transport

A financing instrument for the implementation of European transport infrastructure policy. It contributes to the implementation of the TEN-T framework by funding key projects to modernise infrastructure and removing bottlenecks, while supporting sustainable and innovative transport solutions.

LIFE Programme

The only EU financing program exclusively focused on environmental, climate and energy objectives. The Clean Energy Transition subprogram is a new component of the LIFE program, which was previously included in the Horizon 2020 program. It is particularly significant for hydrogen-related projects.

Important Projects of Common European Interest (IPCEI)

The European Commission also supports cross-border projects covering the entire value chain by approving state aid for Important Projects of Common European Interest (IPCEI).

Annex 3 - Schedule for the Implementation of Measures

		2023				2024	2025	2026
Measure	Measure Name	1Q	2Q	3Q	4Q			
A: HYDROGEN MISSION OF CLIMATE-NEUTRAL SLOVAKIA								
Measure No. 1	Roadmap for hydrogen decarbonisation in Slovakia		-	-	-			
Measure No. 2	National project - "Improving public policies, innovation capacity, communication and support for partnership as regards the use of hydrogen in Slovakia"					-	-	-
Measure No. 3	Creation and amendment of legislation, the regulatory environment, technical and safety standards for hydrogen technologies		-	-	-	-		
B: HYDROGEN VALUE CHAIN								
Measure No. 4	Support for Important Projects of Common European Interest (IPCEI)		-	-	-	-	-	-
Measure No. 5	Support for hydrogen ecosystem pilot projects		-	-	-	-	-	
Measure No. 6	Infrastructure for the use of hydrogen in transport			-	-	-	-	-
C RESEARCH AND DEVELOPMENT TASKS								
Measure No. 7	Hydrogen Technologies Research Centre			-	-	-	-	-
Measure No. 8	Education and knowledge transfer					-	-	-
Measure No. 9	Safety of hydrogen technologies as part of research activities					-	-	-
Measure No. 10	Support for start-ups and spinoff companies					-	-	-