Programme to Support Applied Research and Innovation THETA 2

1. Name of the Programme

Programme to Support Applied Research and Innovation THETA 2 (hereinafter also referred to as the “programme”).

2. Legal Framework of the Programme

The programme shall be implemented pursuant to:

- Act No. 130/2002 Coll., on the support of research, experimental development and innovation from public funds and on the amendment of some related laws (hereinafter also referred to as the “Act on the Support of Research and Development”), as amended;
- Treaty on the Functioning of the European Union 2012/C 326/01 (Article 107);
- Commission Regulation (EU) No. 651/2014 of 17 June 2014 declaring certain categories of aid to be compatible with the internal market in application of Articles 107 and 108 of the Treaty, in particular Articles 25, 28, 29 (hereinafter also referred to as the “Regulation”)[1], as amended;
- Framework for State Aid for Research, Development and Innovation - Official Journal of the European Union 2022/C 414/01, C 7388 of 28 October 2022 (hereinafter also referred to as the “Framework”);
- and other related regulations.

In the event that the funding of the project constitutes state aid pursuant to Article 107(1) of the Treaty, the terms of the Regulation shall apply.

Beneficiaries that are enterprises shall receive funding according to the Regulation. Beneficiaries that are research organisations[2] shall receive funding for activities according to point 20 of the Framework.

In the event that a beneficiary does not meet any of the definitions of an enterprise (does not carry out economic activity)[3] or a research organisation and any funding provided in its

[1] A new Regulation is currently under preparation. No amendments to the parts related to the programme are expected. However, in the event of any significant changes, the programme will be adjusted in accordance with the new legislation. TA CR will consult the Office for the Protection of Competition about the changes.

[2] According to the definition of point 16(ff) of the Framework.

[3] Economic activity means offering goods/services on the market regardless of the (un)profitability of this activity.

favour is in accordance with the objectives of the programme, it is possible to provide funding outside the regime of state aid, i.e., outside the regime of Article 107 of the Treaty on the functioning of the European Union, in the event that one of its defining features is not fulfilled, in particular the funding will not be directed to the economic activities of the beneficiary.

The programme is exempt from the notification obligation pursuant to Article 108(3) of the Treaty on the Functioning of the European Union, as it meets the conditions of the Regulation.

The programme excludes the payment of individual funding in favour of an enterprise:

- against whom a recovery order was issued following the decision of the European Commission, which is outstanding. Based on this decision, the European Commission declared that the funding received from a provider from the Czech Republic is illegal and incompatible with the internal market;
- which meets the definition of an undertaking in difficulty specified in Article 2(18) of the Regulation.

For enterprises receiving state aid in the programme exceeding the limit set in the Regulation, information about the beneficiary and the funding awarded to it (to the extent according to Annex III of the Regulation) shall be published on the central website as provided in Article 9 of the Regulation.

3. Provider

The provider of funding is the Technological Agency of the Czech Republic (hereinafter also referred to as “TA CR”).

4. Identification Code of the Programme

For the purposes of registration in the research, experimental development and innovation information system, the code “TS” is assigned to the programme.

5. Duration and announcement dates of the Programme

The financing period of the programme is set for the period from 2024 to 2031, i.e., 8 years. The Provider expects to announce the first call for proposals in research, development and innovation (hereinafter also referred to as the “call for proposals”) for the selection of projects in 2023, with funding starting in 2024.

The duration of the projects will be determined by the parameters of the specific call for proposals, and their completion may not exceed the duration of the programme.

6. Focus of the Programme

The THETA 2 programme is a programme focused on supporting applied research and innovation in the energy sector, which immediately follows on from the THETA programme. The focus of the programme is, as with the previous programme, relatively broad and affects all areas of dealing with all relevant types of energy in the relevant sectors, including sector coupling and interdisciplinary aspects. It includes connections both at the technical level (e.g., interaction and connection of energy with other fields such as waste management or water in the landscape) and at the social level (e.g., changes in consumer behaviour). It takes into account all the necessary dimensions of energy, from the level of national energy systems to local solutions.

The intention is to create conditions for the transformation of the energy sector in the form of research, especially in the following areas:

- Key emission-free technologies, especially from the point of view of identifying barriers to their development and their removal through instruments available from the public administration;
- Reliability and technological development of emission-free sources, including nuclear sources, together with related research to meet the needs of supervision over the safe and efficient functioning of these sources. Part of the research is the effective integration of renewable energy sources, especially from the point of view of ensuring the reliability of the operation of energy systems and the economic aspects of the functioning of energy markets;
- Modelling the functioning of energy systems and their development with respect to various possible scenarios;
- Economic and social impacts of energy transformation;
- Issues of protection and ensuring the national security of energy sources, transmission networks, and their interconnection.

Furthermore, priority research objectives are set for each call for proposals, which are prepared by the State Office for Nuclear Safety, the Energy Regulatory Office, and the Ministry of Industry and Trade, and they are specified for the individual calls for proposals by the working group of ministries and the aforementioned authorities in coordination with the Ministry of Industry and Trade.

The THETA 2 programme is based on the currently valid wording of national and transnational strategic materials that regulate the conditions for the development of the energy sector. The concept of the programme helps to achieve the objectives and partial implementation strategies of the Czech Republic in the field of energy. It is also in line with

the European vision of achieving an emission-free economy by 2050. The programme is prepared in such a way that it can also implement future versions of strategic and legislative documents, including those that will be created in the future.

Examples of the aforementioned strategic documents are: the National Action Plan for Smart Grids, the National Action Plan for the Development of Nuclear Energy in the Czech Republic, or the National Action Plan for Clean Mobility. It also follows on from strategic documents in the field of climate and air protection, such as the Climate Protection Policy of the Czech Republic, the Strategy on Adapting to Climate Change in the Czech Republic, or the National Emission Reduction Plan of the Czech Republic.

7. Objective of the Programme

The objective of the THETA 2 programme is to contribute to the **transformation and modernisation of the energy sector** through the outputs, results, and impacts of the supported projects, both by preparing innovative technologies, technical solutions, and approaches applicable in the energy sector in the short, medium and long term, and also by creating analyses for decision-making in energy and improving the quality of the regulatory framework. The fulfilment of this objective will support the achievement of the climate and energy objectives to which the Czech Republic has committed itself.

8. Justification of the Objective of the Programme

The focus, structure, and budget of the THETA 2 programme are motivated by the need for an unprecedented and fundamental transformation of the energy sector that will take place in the coming years. The medium-term horizon (the period approximately between 2030 and 2035), in which there should be a relatively significant reduction in greenhouse gas emissions, and the long-term horizon until 2050, within which climate neutrality should be achieved at the EU level, are essential. The need to transform the energy sector is based on existing national policies, strategies, and legislation, as well as on European strategies, of which the so-called European Green Deal[4] will have a major impact. This fundamental transformation is more complex for the Czech Republic, because compared to other EU countries, the Czech Republic is currently largely dependent on the use of fossil fuels (mainly in the electricity and heating sectors, but also in other sectors). The reason is that it has not been possible to significantly reduce energy consumption in the long term by using the potential of energy savings. In the Czech Republic, due to its geographical location, there is also a limited potential for the installation of renewable sources.

[4] More precisely, these are strategies and legislative proposals based on the so-called Green Agreement. In the following years, they will be implemented in national legislation and strategic documents.

The THETA 2 programme accentuates the already started general trends in energy, which are decarbonisation, digitisation, decentralisation, and democratisation[5]. It will contribute to the balanced development of energy within its basic pillars, which are (i) reliability of energy supply, (ii) long-term (environmental) sustainability, and (iii) competitiveness and acceptability of energy prices.

The THETA 2 programme, like the previous THETA programme, is primarily based on the **State Energy Concept of the Czech Republic** (hereinafter referred to as the "SEC CZ"), which sets the priorities and strategic intentions of the state in the energy sector and measures to achieve these objectives. The government-approved update of the SEC CZ (2015) defines five strategic priorities, one of which is research, development, and innovation (the next update is planned for 2023). The SEC CZ is followed by a number of so-called action plans setting the conditions for the development of specific areas. These are, for example, **the National Action Plan for Smart Grids, the National Action Plan for Clean Mobility, the National Action Plan for Energy Efficiency, and the National Action Plan for the Development of Nuclear Energy in the Czech Republic**. Most of these plans are continuously updated.

Other relevant documents for the THETA 2 programme, together with the SEC CZ, which cover the **Strategic Framework for Sustainable Development of the Czech Republic**, are e.g., the Climate Protection Policy in the Czech Republic, the State Environmental Policy of the Czech Republic, the Raw Materials Policy of the Czech Republic, or the Waste Management Plan of the Czech Republic. Also important is the Strategy on Adaption to Climate Change in the Czech Republic, which contains a set of measures for the energy sector (electricity, heating, gas and oil industry) in connection with adaptation to the effects of climate change (ensuring the operation of critical infrastructure, island operation, etc.).

The THETA 2 programme will also be linked to the **National Energy and Climate Plan of the Czech Republic** (2019), the elaboration of which results from the regulation on the administration of the Energy Union. The National Plan specifies five dimensions of the Energy Union from the state's point of view, one of which is "research, innovation, and competitiveness".

The THETA 2 programme will help to optimally fulfil international agreements and strategies of which the Czech Republic is a part. This is primarily the Paris Agreement as part of the UN Framework Convention on Climate Change. At the European level, it is primarily a superstructure vision (approved in 2019) of achieving an emission-free economy by 2050 (the European Green Deal). Currently, partial strategies and legislative proposals of the European Green Deal are being published, primarily a package aimed at reducing greenhouse

[5] The term "democratisation of energy" mainly covers changes in the energy sector associated with a higher influence of energy consumers, where the energy network is decentralised and control over the energy source is taken over (to a certain extent) by the consumer (or the community) that uses it.

gas emissions by 55% by 2030 (the so-called Fit for 55), as well as a package introducing conditions for renewable gases and hydrogen, a plan for a circular economy, or renovation strategies leading to fundamental energy savings in buildings. The current climate and energy objectives are mainly focused on (i) reducing greenhouse gas emissions, (ii) increasing the share of renewable sources in the energy mix, (iii) increasing energy efficiency, and (iv) strengthening the energy infrastructure and increasing interconnectivity.

The THETA 2 programme is also linked to activities and priorities at the level of the **European Strategic Energy Technology Plan (SET Plan)**, primarily from the point of view of the priorities and relevance of technologies for the Czech Republic and the strengthening of international cooperation.

The involvement of entities doing business in the Czech Republic in international supply chains in energy technologies is currently still relatively low. In the case of complex technological units, the investment cycle is long, and the results of research and development are applied over a long period of time. Therefore, the results of the projects in the THETA 2 programme should **contribute to the export of technologies and investment units and the involvement of companies in transnational supply chains**.

The implementation of projects supported in the programme clearly contributes to the achievement of the objectives of the National Priorities of Oriented Research, Experimental Development and Innovation[6] (hereinafter also referred to as the “RDI Priorities”), especially in Priority Area No. 2 Sustainability of energy and material resources, and additionally (or cross-sectionally) contributes to other areas of the RDI Priorities.

The THETA 2 programme is also intended to help achieve the objectives of the relevant national strategies (and in the future also their follow-up versions). At the time of preparation of the programme, these are specifically the National Research, Development and Innovation Policy of the Czech Republic 2021+ approved by Government Resolution No. 759 dated 20 July 2020 (especially objectives 1, 2, 4, and 5)[7]; the National RIS3 strategy approved by Government Resolution No. 66 dated 25 January 2021; and the Innovation Strategy of the Czech Republic 2019–2030 approved by Government Resolution No. 104 on 4 February 2019. The programme will also help implement the Strategic Framework for Economic Restructuring of the Ústí nad Labem, Moravian-Silesian, and Karlovy Vary Regions (RE:START) approved by Government Resolution No. 321 dated 29 March 2021.

Based on the experience from the implementation of the THETA programme, it is also assumed that early-stage researchers will be involved in project implementation teams. This in itself is a positive benefit of the programme, as it includes their involvement in high-quality

[6] Approved by Government Resolution No. 552 of 19 July 2012.

[7] For more details, see Annex 1: Analysis of the solved issues of the THETA 2 programme.

projects in the field of energy and thereby the creation of a pool of future researchers with previous practical experience (support for quality projects is guaranteed by the evaluation process when selecting projects for funding).

9. Criteria for Meeting the Objectives of the Programme

The Provider will evaluate the achievement of the objectives of the programme in accordance with the Methodology for the Evaluation of the Results of Research Organisations and the Evaluation of the Results of Completed Programmes valid at the time of the programme evaluation (hereinafter referred to as the “Methodology”), or other conditions set by the Provider.

The evaluation of the achievement of the objectives of the programme will take place on the basis of a set of indicators intended for monitoring the progress of the programme (interim evaluation) and evaluation of its overall performance and success (impact evaluation).

Table 9.1: Indicators of the THETA 2 programme

Indicator	Value
Average aid intensity (%)	70
Minimum number of funded projects	550
Minimum rate of successfully completed projects (%)	80
Minimum number of outputs achieved	1,000
Minimum number of outputs applied	800

*Programme indicators are monitored at the level of individual sub-programmes and calls for proposals, which is explicitly reflected in every statistical evaluation and report conducted after the end of the given call for proposals.

*The aforementioned indicator system does not define specific criteria for evaluating the achievement of the objectives of the programme. More details are included in Section 18 of the programme and Section 9 of Annex 1.

10. Expected Results and Benefits of the Programme

As in the THETA programme, the THETA 2 programme will support projects that are reasonably expected to achieve usable outputs, including publications, the application of which will contribute to the achievement of the set objectives of the programme and to positive social impacts. The programme will lead to the achievement of the following outputs in the form of results according to the Methodology and the Information Register of R&D results (RIV) valid at the time of their application:

Results relevant for sub-programme 1:

- P – patent
- G – technically implemented results – prototype, functional sample
- Z – pilot plant, verified technology
- R – software
- F – industrial design, utility model
- H – results projected in legislation and standards and results projected into guidelines and other non-legislative regulations that are mandatory under the relevant provider
- N – methodologies (NmetS, NmetC, NmetA), procedures, and specialised maps with professional content
- O – other results

Results relevant for sub-programme 2:

- P – patent
- G – technically implemented results – prototype, functional sample
- Z – pilot plant, verified technology
- R – software
- F – industrial design, utility model
- O – other results
- N – methodologies (NmetS, NmetC, NmetA)

Results relevant to sub-programme 3:

It is assumed that all results of basic and applied research according to the evaluation system approved by the government and valid at the time these results will be submitted to the RIV.

Among the expected benefits of the THETA 2 programme is a contribution to solving the challenges and needs of society and the economy in the field of energy. It is possible to

divide the benefits into two categories/areas that will be affected by the implementation of the programme: i) economic impacts; ii) social impacts. The benefits of the main objective and the objectives of the individual sub-programmes are interconnected at the programme level; therefore, they are not broken down separately for each sub-programme.

Economic impacts are considered to be the development of technologies and procedures and related impacts such as the increased sales and profitability, labour productivity, and exports of enterprises. These impacts can bring about an increase in the efficiency and usability of the obtained energy. In addition, it is also possible to expect the streamlining of technological procedures or, for example, an increase in the number of Czech participants in the instruments of EU programmes.

Social impacts are considered to be an increase in the quality of life in society, e.g., in the form of improving the quality and efficiency of services in the field of energy, easier access to new technologies in the form of open access to R&D, or the prevention of potential negative impacts associated with changes in the energy sector. Furthermore, it is assumed that the technologies will be widely used due to their transfer and availability to both experts and the general public.

For cooperating research organisations, the benefits of the programme will be manifested, e.g., in an increase in the number of their results applied in practice, in the number of commercialised patents and an increase in their commercialisation potential (both domestically and abroad).

11. Applicants for Funding and their Eligibility

Funding for a project implemented under the programme may only be obtained by applicants who meet the eligibility conditions laid down in Article 18 of the Act on the Support of Research and Development, the Regulation, and the Framework. If several applicants apply together to perform a single project, then the obligation to demonstrate eligibility shall apply to all of these applicants.

Eligibility is demonstrated by an applicant with documents in accordance with the Act on the Support of Research and Development in the manner specified by the Provider in the call documentation.

Applicants or beneficiaries of funding for a project pursuant to the Act on Support for Research, Experimental Development and Innovation, the Framework and Regulations may be:

- **Research and knowledge-dissemination organisations** – legal persons meeting the definition of a research organisation pursuant to Article 2(83) of the Regulation and pursuant to the Act on the Support of Research and Development. These organisations may implement the project individually or in collaboration with other participants. If research organisations perform economic activities in addition to non-economic activities, they are obliged to maintain separate accounting for the expenditure and income from these economic activities.
- **Enterprises** – legal and natural persons engaged in economic activity, regardless of legal form (Annex I of the Regulation), who implement the project individually or in collaboration with other participants and demonstrate the ability to co-finance the project from non-public sources.

The exception for beneficiaries who do not meet any of the definitions of an enterprise or research organisation is described in Section 2 and will be applied accordingly.

The preferred model of collaboration is the participation of a research organisation in collaboration with an enterprise.

12. Expenditure on the Programme

The total expenditure on the programme is based on an analysis of the absorption capacity, which takes into account the evaluation of calls for proposals in the field of energy to date and is distributed according to the gradual announcement of the calls for proposals. The amount from the state budget (SB) is 7,410 million CZK. The amount of expenses from other sources is 3,211.7 million CZK.

Proposed budget for the THETA 2 programme (in mil. CZK)

	2024	2025	2026	2027	2028	2029	2030	2031	Total
Total	774.0	1,304.4	1,619.8	1,619.8	1,619.8	1,619.8	1,290.1	774.0	10,621.7
Funding from the SB	540.0	910.0	1130.0	1130.0	1,130.0	1,130.0	900.0	540.0	7,410.0
Other sources	234.0	394.4	489.8	489.8	489.8	489.8	390.1	234.0	3,211.7

13. Aid Intensity

The expected average aid intensity in the programme is 70%. The aid intensity, determined as a percentage of eligible project costs, will be calculated separately for each project and for each beneficiary and other participant. If funding will be provided to enterprises according to the Regulation, the maximum aid intensity specified therein must be respected.

Table 13.1: Maximum aid intensity for industrial research and experimental development by category of participants

Activity category	Beneficiary			
	Small enterprise*	Medium-sized enterprise*	Large enterprise*	Research organisation**
Industrial research	70 %	60 %	50 %	100 %
Industrial research using an increase in aid intensity****	80 %	75 %	65 %	100 %
Experimental development	45 %	35 %	25 %	100 %
Experimental development using an increase in aid intensity****	60 %	50 %	40 %	100 %
Innovation intended for small and medium-sized enterprises	50 %	50 %	-	-
Innovation of processes and organisational innovation	50 %	50 %	15 %***	-

*A small and medium-sized enterprise is defined according to Article 2(2) and Annex I of the Regulation, and a large enterprise is defined according to Article 2(24) of the Regulation.

**Research organisation is defined according to Article 2(83) of the Regulation. The indicated aid intensity is intended for non-economic activities of research organisations, which are activities according to point 20 of the Framework.

***Support for large enterprises for innovation of processes and organisational innovation is compatible only under the conditions stated in Article 29(2) of the Regulation.

**** An increase in the aid intensity may be used if one of the conditions of Article 25(6)(b)(i) and (ii) of the Regulation. The Provider will state the specific definition in the tender documentation for the relevant call for proposals.

14. Eligible costs

Funding shall be provided for eligible project costs, i.e., for those eligible costs that are justified, are to the extent necessary for the purposes of the project and are approved by the Provider. The applicant may propose as eligible costs only the costs defined in accordance with the Act on the Support of Research and Development, and in the case of funding under the state aid regime according to the aid category, i.e., in accordance with Article 25, Article 28, and Article 29 of the Regulation. More detailed specifications of the eligible costs will be provided of the call documentation for the relevant call for proposals.

15. Incentive Effect

In order to achieve the objectives of the programme and the conditions of the Regulation, the Provider will assess the incentive effect of the funding pursuant to Article 6 of the Regulation as part of the evaluation process of the project proposals. In order to achieve the incentive effect pursuant to Article 6 of the Regulation, the start of works[8] on the project/activity must not be prior to the application for funding being submitted.

16. Method and general criteria for evaluating project proposals

The Provider will comprehensively evaluate the project proposals in accordance with the Act on the Support of Research and Development. Each project proposal will be evaluated by at least two independent experts. The Provider will set up an expert advisory body for the evaluation of project proposals accepted into the call for proposals. Proposed general evaluation criteria:

- Meeting the conditions of the call for proposals;
- Necessity of the project and its contribution to the fulfilment of the objectives of the programme;
- Expected benefit and quality of the project result;
- Feasibility and procedure of project implementation.

The detailed method of evaluating project proposals, points, and threshold values of individual evaluation criteria are set out in the call documentation for the relevant call for

[8] Pursuant to Article 2(23) of the Regulation, 'start of works' means the earlier of either the start of construction works relating to the investment, or the first legally binding commitment to order equipment or any other commitment that makes the investment irreversible. Buying land and preparatory works such as obtaining permits and conducting feasibility studies are not considered start of works. For take-overs, 'start of works' means the moment of acquiring the assets directly linked to the acquired establishment.

proposals. TA CR will not use the institute of consensus negotiation in the evaluation process.

The Provider will use data and analytical tools to evaluate possible duplications, contiguities, complementarities, and synergies between various already implemented projects and project proposals.

17. Sub-Programmes

For the purpose of achieving the objective, the programme is divided into three sub-programmes, which support and complement each other according to their focus and scope. More detailed specifications of the focus of individual sub-programmes are provided in the call documentation for the relevant call for proposals.

The sub-programmes included below follow on from the sub-programmes of the previous THETA programme and aim to continue supporting similar projects. It is also important to shift the results of research and innovation in this field closer to fulfilling the obligations that the Czech Republic has in this regard (e.g., in the areas of decarbonisation, effective “clean” energy sources, energy efficiency, etc.).

Sub-programme 1 – Research in the public interest

Objective and Focus of Sub-Programme 1

The aim of the sub-programme is to contribute to the creation of high-quality data (analyses, models, evaluation of alternative scenarios, etc.) for objective decision-making by the public administration in the administration of the energy sector (strategy, policies, legislation, regulation and pricing, setting standards, or determination of subsidies). This is accomplished through the identification of solutions that are feasible and cost-effective under the conditions of the Czech Republic for the fulfilment of the strategy of achieving climate neutrality and at the same time ensure the supply of energy in the necessary volume, time, and quality with acceptable effects on the environment and at prices that support the competitiveness of the Czech Republic. The sub-programme will contribute to the evaluation of an integral and systemic view of the transforming energy sector, including the evaluation of the impacts on society, and to the understanding of the motivation and behaviour of entities and actors in the energy sector, with a special focus on the preferences and behaviour of end consumers, including their attitudes, values, and standards.

The solved themes will take into account the basic and interconnected trends in energy, which are decarbonisation, decentralisation, digitisation and democratisation, from the point of view of public interest. They will also emphasise interdisciplinary technical areas, i.e., the interaction and connection of energy with other sectors (transport, industry, landscape management, soil, water, and waste management, agriculture, and forestry).

Budget for Sub-Programme 1

The maximum aid intensity for the sub-programme is 90% of the total eligible costs of the project.

Table 17.1: Budget for sub-programme 1 (in mil. CZK)

	2024	2025	2026	2027	2028	2029	2030	2031	Total
Total	79.0	133.1	165.2	165.2	165.2	165.2	131.7	79.0	1083.6
Funding from the SB	71.1	119.8	148.7	148.7	148.7	148.7	118.5	71.1	975.3
Other sources	7.9	13.3	16.5	16.5	16.5	16.5	13.2	7.9	108.3

Sub-programme 2 – Energy technologies for competitiveness

Objective and Focus of Sub-Programme 2

Projects in sub-programme 2 shall contribute to the preparation of technologies and solutions with rapid application in practice, whereby supporting the competitiveness of the innovation sphere, manufacturing and supply enterprises operating in the Czech Republic, and increasing their export potential through products and production processes with high added value and their involvement in international value chains. The supported technologies and technological solutions should contribute to the fulfilment of the climate-energy and environmental objectives of the Czech Republic, especially in the short- and medium-term horizon. However, in this regard it is mostly a secondary objective of this sub-programme.

Funding shall be concentrated both in new areas (where start-ups are expected to be created or the expansion of an enterprise's product line with highly innovative products and services) and in traditional areas in which research and development in the Czech Republic is already at a European and world level or can make significant use of competitive advantages (tradition, know-how, geographical conditions, existence of infrastructure, strong position on international markets, etc.).

Budget for sub-programme 2

The maximum aid intensity for sub-programme 2 is 60% of the total eligible costs of the project.

Table 17.2: Budget for sub-programme 2 (in mil. CZK)

	2024	2025	2026	2027	2028	2029	2030	2031	Total
Total	487.5	821.7	1 020.2	1 020.2	1 020.2	1 020.2	812.5	487.5	6690.0
Funding from the SB	292.5	493.0	612.1	612.1	612.1	612.1	487.5	292.5	4013.9
Other sources	195.0	328.7	408.1	408.1	408.1	408.1	325.0	195.0	2676.1

Sub-programme 3 – Technology to ensure the long-term sustainability of the energy industry

Objective and Focus of Sub-Programme 3

Sub-programme 3 shall support projects preparing technologies and solutions, which at the time of project design are at a lower level of technological readiness (TRL, typically 3 to 5) and where the results are not primarily expected to be readily applicable in practice. As a rule, these are projects with a higher degree of risk in terms of achieving the planned objectives and parameters compared to the projects in sub-programme 2. Projects should be aimed at the preparation of new and non-traditional solutions, and therefore support fundamental and groundbreaking innovations that will help the Czech Republic:

- effectively meet climate-energy and environmental objectives, energy security, and ensure acceptable energy prices in the medium- to long-term horizon;
- strengthen competitiveness through the development of unique products.

In justified cases, there may be complex and longer-term projects, if these projects aim at complex and integral technological solutions. In such cases, it is assumed that the principal investigators will mainly be established research organisations with extensive international ties.

Budget for sub-programme 3

The maximum aid intensity for sub-programme 3 is 85% of the total eligible costs of the project.

Table 17.3: Budget for sub-programme 3 (in mil. CZK)

	2024	2025	2026	2027	2028	2029	2030	2031	Total
Total	207.5	349.6	434.4	434.4	434.4	434.4	345.9	207.5	2848.1
Funding from the SB	176.4	297.2	369.2	369.2	369.2	369.2	294.0	176.4	2420.8
Other sources	31.1	52.4	65.2	65.2	65.2	65.2	51.9	31.1	427.3

18. Evaluation of the Programme

Evaluation of targeted support programmes takes place in all life cycles of the given programme, i.e., during the conception of the programme design, during the course of its implementation, and after its completion. The following chapter presents the individual types of evaluations as well as the basic evaluation procedures of the THETA 2 programme, i.e., determination of the evaluation of the programme and time schedule of the planned evaluations. A more detailed description of individual parts of the evaluation including the proposed analytical methods is presented in Section 9 “Evaluation Framework of the Programme” in Annex 1.

Types of Performed Evaluations

The evaluations focus on the programme itself, its calls for proposals, and supported projects, for which the following evaluations will be used.

Ex-ante evaluation of the programme was incorporated into the preparation phase of the programme and its purpose was to provide the elaborators with constructive feedback on individual parts of the programme and to gradually assess part of the analytical, design, and indicator system and to assess the activity and potential benefits and impacts. The evaluation focused on the following three aspects:

- Focus and objectives of the programme;
- Results and outputs of the programme; and
- Establishment of the indicator system of the programme.

Interim evaluation of the programme shall focus on an evaluation of the implementation, the established processes, and the ongoing achievement of the objectives of the programme

and its calls for proposals. The output of the evaluation shall be a final report that summarises the answers to the evaluation questions and provides recommendations aimed at making the current programme, or a subsequent programme, work more efficiently.

Final evaluation of the programme shall focus on the achievement of the objectives of the programme after its completion. The aim of the evaluation shall be to assess the success of the programme, its benefits, and results immediately after its completion. As part of the final evaluation, the specific objectives of the individual sub-programmes should also be evaluated, in addition to the programme indicators. For this, the following indicators may be used:

- For all sub-programmes: the number of results used in practice (with documentation of their application) three years after the end of the project, the number of early-stage researchers in completed projects;
- To evaluate the achievement of PP2 objectives, indicators indicating the technological competitiveness of enterprises involved in the THETA 2 programme can be used, e.g., increase in R&D expenditure, increase in the number of employed researchers, share of sales from innovative products in total sales, share of sales from license sales in total sales, etc;
- To evaluate the achievement of PP2 and PP3 objectives: the number of enterprises innovating their products and services in the electricity, gas, heat and air production and distribution sectors (from the results of the Community Innovation Survey), the number of commercialised patents in the field of energy.

Evaluation of the impact of the programme shall focus on revealing the benefits and impacts of the THETA 2 programme and all its interventions during the implementation period. The evaluation shall focus on an assessment of the qualitative benefits, particularly in the following areas:

- Development of technologies and procedures in the field of energy;
- Increasing the efficiency of energy production and its usability;
- Improving the quality and efficiency of services in the field of energy;
- Facilitating access to new technologies in the form of open access to R&D;
- Contribution of the programme to the fulfilment of the climate objectives of the Czech Republic and the EU; and
- Contribution of the programme to the concepts of decarbonisation, decentralisation, democratisation, and digitisation of energy.

An independent heterogeneous group of experts shall be involved in the impact evaluation, which should include representatives of a research organisation, the public sector, and the

application sphere, including foreign experts who are knowledgeable and actively involved in the energy sector.

Time Schedule of the Evaluation

Table 18.1: Preliminary evaluation time schedule

Year of elaboration	Type of evaluation	Estimated time span	Expected form of elaboration
2022	Ex-ante	3 months	External
2026	Interim	8–12 months	Internal
2032	Final	12–16 months	External
2036	Impact	12–18 months	External

19. Comparison of the Current Situation in the Czech Republic and Abroad

In the Czech Republic, there are several public financing programmes aimed at supporting the transformation of the energy sector. Below is a brief overview of their links and an evaluation of practice abroad. However, this is only contextual information, more detailed information may be found in the relevant documents. In the Czech Republic, TA CR implemented a programme to support applied research and experimental development EPSILON, the second sub-programme of which was aimed at achieving a long-term sustainable energy mix that supported the shift towards a less resource-intensive society. In 2015, the Ministry of Industry and Trade also launched the TRIO programme, which focused on supporting applied research, including in the field of energy. However, the projects had to be linked to so-called key enabling technologies and at the same time achieve the objectives set by the programme from the RDI Priorities. Currently, the **TREND** programme, which is based on the EPSILON programme (TA CR) and the TRIO programme (MIT), is mainly used for support. The programme is aimed at increasing the international competitiveness of enterprises through the support of industrial research and experimental development projects and the implementation of their results in practice, especially in industrial production and in the offer of products on the market according to the principles of the Industry 4.0 initiative in key application sectors identified by strategic documents and initiatives of the Czech Republic and European Union, particularly the **National RIS3 strategy**. In sub-programme 2 “Newcomers”, the objective is to initiate research and development activities in enterprises that have not yet regularly conducted research activities or purchased services from research organisations. The main applicant is an enterprise that received funding for research and

development to the maximum sum of 1 million CZK in the last five years. A research organisation can only participate as an additional participant.

Another relevant programme is the **Operational Programme Technologies and Application for Competitiveness for the period 2021–2027 (OP TAC)**. The objectives are, among other things, as follows:

- Increase added value and productivity, especially of small and medium-sized enterprises;
- Develop new innovative companies;
- Facilitate the transition to a sustainable and digital economy, which includes a modern approach in the field of energy.

A total of 81.5 billion CZK is prepared for individual activities. Enterprises from all over the Czech Republic may apply for support from the programme, with the exception of projects implemented in the territory of the Capital City of Prague.

Czech-Norwegian cooperation in research and development of CCS technologies is an important instrument for mitigating climate change. CSS stands for carbon capture and storage and the call is funded by the KAPPA programme (TA CR), the EEA, and Norway Funds. Cooperation with Norwegian entities is an opportunity for the Czech Republic to gain experience and international contacts, which researchers can then use for e.g., further cooperation within the KAPPA programme and in other international programmes.

Horizon Europe (2021-2027) is currently a key EU programme, following on from Horizon 2020, for the support of research and innovation. It is intended to help combat climate change, achieve the UN's Sustainable Development Goals and strengthen the EU's competitiveness and growth. The programme facilitates cooperation and strengthens the impact of research and innovation in the development, support and implementation of EU policies to address global challenges. It is intended to support the generation and dissemination of cutting-edge expertise and technologies. It creates jobs, helps fully engage the most talented people, supports economic growth and industrial competitiveness, and optimises investment impact as part of strengthening the European Research Area. Legal entities from the EU and associated countries can join it. Instruments of Horizon Europe with an influence on the field of energy include the following **European Partnerships**:

1) Driving Urban Transition – DUT (or Sustainable, Smart and Inclusive Cities and Communities SSI-CC): The DUT partnership is no focused solely on energy, and previously only its energy part was supported from the THETA programme. Follow-up support will continue from the SIGMA programme.
2) Clean Energy Transition – CET: The CET partnership consists of so-called "Transition Initiatives": Transition Initiative 1: Optimised Integrated European Net-

Zero Emissions Energy System; Transition Initiative 2: Enhanced Zero Emission Power Technologies; Transition Initiative 3: Enabling Climate Neutrality with Storage Technologies, Renewable Fuels and CCU/CCS; Transition Initiative 4: Efficient Zero Emission Heating and Cooling Solutions; Transition Initiative 5: Integrated Regional Energy Systems; Transition Initiative 6: Integrated Industrial Energy Systems; Transition Initiative 7: Integration in the Built Environment. CET support is also expected from the SIGMA programme.

Research and development support programmes similar to the THETA 2 programme exist in several European countries. For example, in Austria, the basic objectives for energy research and development are defined with the aim of fulfilling climate and energy obligations. Since 2007, the main source of funding for energy research and development has been the **"Climate and Energy Fund"** (administered jointly by the ministries BMVIT - Transport, Innovation and Technology and BMLFUW - Science, Research and Economy). This programme supports projects in the fields of buildings, mobility, production and energy supply, which focus specifically on the sectors currently responsible for the majority of greenhouse gas emissions. Austria is very active in the preparation and implementation of the CET partnership.

In Germany, support for research and development (including energy R&D) has always been at a high level with regard to its industrial character. Energy support has been re-allocated in connection with the Energiewende (Energy Transition). In 2022, Germany will announce the first tender in the world focused on the production of hydrogen from offshore wind energy. Support of 50 million EUR will be given to producers in Germany's exclusive economic zone in the North Sea. The federal government generally supports research and development in the field of promising energy technologies. In particular, it uses the "**7th Energy Research Programme**". The programme is a strategic element of the federal government's energy policy aimed at supporting this continuous research and innovation process. In this context, funding is mainly focused on technologies that meet the requirements of the energy transformation. Regarding the thematic priorities of energy efficiency and renewable energies, the focus is on financing measures for technologies in the field of wind and solar energy production, a higher proportion of renewable sources in heating through biomass and geothermal energy, energy-optimised buildings and neighbourhoods, and energy efficiency in the industrial sector. Of particular importance are issues related to network development, energy storage, and sectoral linkages by integrating new technologies into the energy system.

Sweden has become an innovation leader in several areas such as smart grids, the second generation of liquid biofuels, as well as the separation and storage of carbon dioxide in the geological subsoil (CCS technology). The Swedish Energy Agency has many programmes covering electromobility, smart grids, system studies, renewable sources (biomass, hydropower, in the past also solar energy, which was subsequently found to not be very efficient), and energy savings.