

THETA: Funding programme for applied research, experimental development and innovation

1. NAME OF THE PROGRAMME

THETA: Funding programme for applied research, experimental development and innovation (hereinafter referred to as “programme”).

2. LEGAL FRAMEWORK FOR THE PROGRAMME

The programme shall be implemented with regard to:

- Act No. 130/2002, on the Support of Research, Experimental Development and Innovation from Public Funds and on the Amendment of Certain Related Acts (hereinafter referred to as “Support of Research and Experimental Development and Innovations Act”), as amended;
- the Treaty on the Functioning of the European Union 2012/C 326/01, (in particular article 107, and possibly also articles 93 and 106);
- Commission Regulation (EU) No 651/2014 of 17th June 2014 declaring certain categories of aid compatible with the internal market in accordance with Articles 107 and 108 of the Treaty - Official Journal of the European Union L 187, 26th June 2014, hereinafter referred to as “Regulation”), in particular Articles 25, 28 and 29;
- the Framework for State Aid for Research, Development and Innovation - Official Journal of the European Union C 198, 27th June 2014 (hereinafter referred to as “Framework”);
C 198 of 27 June 2014 (hereinafter referred to as the "Framework");
- and other related laws and regulations.

The programme is exempt from the notification requirement of Article 108(3) of the Treaty on the Functioning of the European Union as it fulfils the conditions of the Regulation.

This programme excludes disbursement of individual aid to an undertaking:

- in favour of an undertaking which is subject to an outstanding recovery order following a previous Commission decision declaring an aid illegal and incompatible with the internal market,
- meeting the definition of an undertaking in difficulty referred to in Article 2(18) of the Regulation.

For undertakings awarded state aid exceeding EUR 500 000 under the programme, the information on the beneficiary and the aid awarded (to the extent specified in Annex III of the Regulation) shall be published on a central website as provided in Article 9 of the Regulation.

The programme shall be implemented in accordance with the National Policy on Research, Development and Innovation of the Czech Republic for the years 2016 to 2020, approved by Government Resolution No. 135 of 17th April 2016, the National Priorities of Oriented Research, Experimental Development and Innovations adopted by Government Resolution No. 552 of 19th July 2012 (hereinafter referred to as “NPOV”), the National Energy Action Plan of the Czech Republic, adopted by Government Resolution No. 362 of 18th May 2015, the updated National Research and Innovations Strategy for Intelligent Specialisation of the Czech Republic, adopted by Government Resolution No. 634 of 11th July 2016, the principles

of the Industry 4.0 Initiative acknowledged by Government Resolution No. 729 of 24th August 2016 and other national and sectoral strategies.

3. PROVIDER

The Provider is the Technology Agency of the Czech Republic (hereinafter referred to as “TA CR”).

4. PROGRAMME IDENTIFICATION CODE

For the purposes of registration in the information system for research, experimental development and innovation, the programme was assigned a “TK” code.

5. DURATION AND DATES OF ANNOUNCEMENT

The programme is supposed to run from 2018 till 2025, i.e. for a period of 8 years.

The public tender in applied research and experimental development and innovations (hereinafter referred to as “public tender”) for selecting projects eligible for the programme shall first be open in 2017 and the aid shall first be distributed in 2018. Subsequent public tenders shall be announced every year from 2018 till 2023.

The maximum duration of projects under this programme is 8 years. An average length of 36 months can be expected.

Project duration must not exceed the duration of the programme itself.

6. PROGRAMME FOCUS

The focus of the programme is based on the updated State Energy Concept of the Czech Republic, adopted by the Czech Government in May 2015. This document outlines the need to provide support for research and development projects in the field of energy following the adopted strategic documents and the European Strategic Energy Technology Plan, through strategic streamlined support for research projects in the energy sector in the context of the Sustainable Energy priority area.

Over the last few years, many other top strategic documents have been adopted in the field of energy. These include, in particular, the National Action Plan for the Development of Nuclear Energy in the Czech Republic, the National Action Plan on Smart Grids, the National Action Plan for Clean Mobility, the National Action Plan for the Energy Efficiency of the Czech Republic, the Action Plan for Biomass 2012-2020, the Multiannual Programme for the Support of Further Use of Sustainable Biofuels in Transport for 2015-2020 and some other strategic documents, which are based on the strategic framework of the State Energy Concept of the Czech Republic. Furthermore, these are strategic documents that are not directly focused on the energy sector but are closely related to this issue. These documents form the basis of the sectoral and strategic focus of this programme.

The programme focuses on projects falling under the category of applied research according to Article 25(2)(b) and (c) of the Regulation and Article 1(3)(e) of the Framework (including industrial research, experimental development or a combination thereof), the results of which have a high potential for rapid application in many areas of social life in the Czech Republic.

The implementation of the projects supported by the programme will definitely contribute to meeting the objectives of NPOV, esp. Priority area 2 *Sustainable energy and material resources*, but it should also complement, as an interdisciplinary component, other NPOV priorities.

The programme will contribute to making public funds invested in applied research bring economic or other social benefits from their implementation. The knowledge gained will contribute to defining the factors and processes that determine and influence the functioning and development of Czech society in the context of the ongoing European integration and the globalization in the field of energy. The implementation of the programme mainly assumes the application of industrial research projects (possibly involving the necessary activities in oriented basic research) as well as the support of projects with a predominance of experimental development.

The programme will build on other national R&D&I programmes, especially TIP, TRIO, ALPHA and EPSILON.

The programme shall be available for synergetic and complementary effects as part of international schemes such as the H2020¹, Euratom and other EU programmes and international programmes complying with the focus of the programme.

7. OBJECTIVE OF THE PROGRAMME

The objective of the programme is to contribute, in the medium and the long term and through the outputs, results and impacts of the supported projects, to materialize the vision of transformation and modernization of the energy sector in line with the adopted strategic documents. That will be achieved by supporting energy research, development and innovation, with special focus on (i) supporting projects in the public interest, (ii) new technologies and system components with a high potential for early application, and (iii) supporting long-term technological perspectives.

8. JUSTIFICATION OF THE OBJECTIVE OF THE PROGRAMME

The Government of the Czech Republic adopted the updated State Energy Concept of the Czech Republic in May 2015 (Resolution No. 362 of 18th May 2015). It is the principal document in the field of energy, which determines the strategic assignment for the development of Czech energy for decades to come. This document is also binding for the state administration in the field of energy management. TA CR was mandated, in cooperation with the Ministry of Industry and Trade and the Ministry of Education, Youth and Sports, to “support the pilot R&D projects in the energy sector as a follow-up to the SET Plan². The aim is also to target the new programme of strategically directed support for research projects in the field of energy (smart grids, energy storage, R&D in nuclear technologies) in the context of the “Sustainable Energy” priority area according to Czech Government Resolution No. 552 of 19th July 2012 NPOV and the needs arising from the State Energy Concept.”

The programme complies with NPOV and further responds in particular to research and development measures formulated in the National Action Plan for the Development of Nuclear Energy in the Czech Republic (according to Government Resolution No. 419 of 3rd June 2015), the National Action Plan for Clean Mobility (Government Resolution No. 941 of 20th November 2015), the National Action Plan for Smart Grids (Government Resolution No. 149 of 4th March 2015) and other relevant strategic documents.

Another motivation for the programme was the fact that in May 2015, the creation of the so-called Energy Union was decided at European level with the support of the Member States. One of the five main pillars of the Energy Union is focused on research, development, innovation and competitiveness. The European Strategic Energy Technology Plan, which

¹ Subsequently, it should be available within the Framework Program for Research and Innovation, which will replace Horizon 2020 starting from 2021.

² European Strategic Energy Technology Plan

emphasizes the system view of research and development in the field of energy, has been identified as the key subject in meeting the objectives of that pillar. The European Strategic Energy Technology Plan should serve as one of the key points for formulating the key priorities to ensure the consistency of national and European priorities, taking into account national particularities. In the context of the Energy Union, there is also a periodic evaluation of the achievement of the objectives in the individual pillars (the first evaluation of the status of the Energy Union was introduced in the communication published in November 2015). The THETA programme is then one of the main national tools for implementing the fifth pillar of the Energy Union aimed at research and development in the field of energy.

In the long run, the programme helps to implement the European climate and energy policy in the Czech Republic within its basic pillars: (i) energy security, (ii) long-term sustainability and (iii) competitiveness - affordability. The programme is also an important tool in the context of the agreed climate and energy goals by 2030, focusing in particular on (i) reducing greenhouse gas emissions, (ii) increasing the share of renewable energy sources in the energy mix, (iii) increasing energy efficiency, and (iv) enhancing the energy infrastructure and increasing interconnections. This programme also partially contributes to the transformation of the energy sector in line with the Roadmap for moving to a low-carbon economy by 2050.

9. CRITERIA FOR COMPLIANCE WITH THE PROGRAMME OBJECTIVES

The achievement of the objectives of the programme shall be evaluated in accordance with the Methodology for evaluating the results of the research organisations and the results of the completed programmes valid at the time of evaluation of the programme, or the conditions set by the provider. Achieving the objectives of the programme shall be evaluated, among other factors, on the basis of a set of indicators designed to monitor the progress of programme implementation and to evaluate its overall performance and success.

Table 9. 1: Programme indicators

Indicator	Value
1. Maximum allowable funding intensity for the programme	70 %
2. Minimum number of projects supported	300
3. Minimum rate of successfully completed projects	80 %
4. Minimum number of results	550
5. Minimum number of results applied	440

10. EXPECTED RESULTS AND BENEFITS OF THE PROGRAMME

Mostly projects that can reasonably be expected to accomplish usable results, including publications, and whose application will contribute to meeting the objectives of the programme and benefits for the society shall be supported under this programme. The programme shall make it possible to achieve the following outputs in the form of results in compliance with the Methodology and the RIV (Register of information on Results) valid at the time of their application.

Results relevant for Subprogramme 1:

P - patent;

G - technically realized results - prototype, functional sample;

Z - pilot production, proven technology;

R - software;

F - industrial and utility model;

H - results reflected in the legislation and standards and the reflected in non-legislative directives and regulations binding within the competence of the respective provider.

N - Certified methodologies, procedures and specialized maps with professional content;

Results relevant for Subprogramme 2:

P - patent;

G - technically realized results - prototype, functional sample;

Z - pilot production, proven technology;

R - software;

F - industrial and utility model.

Results relevant for Subprogramme 3:

All results of basic and applied research based on the evaluation system approved by the government and valid at the time of delivery of those results to RIV.

Among the expected benefits of the programme are mainly the improvement of the quality and number of research and development results that shall be put to practice in the form of innovative products, procedures, processes or services. The primary expected benefit of Subprogramme 1 is improving the public management of energy, and a fast implementation of the projects' results in the case of Subprogramme 2; that should have a secondary effect in improving the supported entities' indicators (e.g. growth in turnover, export, etc.). For Subprogramme 3, the expected benefit is a clear advancement in research and development of promising technologies, or system energy solutions.

For collaborating research organisations, the benefits of the programme will materialize, for example, in an increased number of results applied, in the number of patents commercialized and a growing commercialization potential. Another secondary effect can be seen in strengthening the effective transfer of know-how and technologies into practice.

11. APPLICANTS AND PROOF OF ELIGIBILITY

Eligible applicants, or, beneficiaries of aid for projects under all subprogrammes pursuant to the Support of Research and Experimental Development and Innovations Act, the Framework and the Regulation:

Enterprises - legal and natural persons who are engaged in an economic activity, regardless of legal form (Annex 1 of the Regulation) and carry out the project alone or in collaboration with other participants and demonstrate the ability to co-finance the project from non-public sources.

Research and knowledge dissemination organisations (hereinafter referred to as "research organisations") - legal entities that meet the definition of research organisation pursuant to Article 2(83) of the Regulation and the Support of Research and Experimental Development and Innovations Act and which manage the project alone or in collaboration with other participants.

Other candidates relevant only for Subprogrammes 1 and 3

Other natural and legal persons of public and private law, irrespective of their legal form or method of financing, which shall carry out activities for which the aid is provided outside the State aid scheme, i.e. they shall not be enterprises.

Only those applicants who meet the eligibility conditions set out in Section 18 of Act no. 130/2002 can obtain funding for a project implemented under the programme. If more than one applicant are involved in one project, eligibility must be proven for all of them. Eligibility shall be substantiated by the applicant in accordance with the Support of Research and Experimental Development and Innovations Act, as determined by the Provider in the tender specification.

12. EXPENDITURE ON THE PROGRAMME

The total expenditure on the programme is defined for the duration of the programme based on an analysis of the absorption capacity and an evaluation of the current public tenders relevant for the field of energy; it is scheduled in accordance with the expected progression of announcements of individual public tenders in research, development and innovation.

The total expenditure on individual projects and actions are calculated according to Article 4 of Commission Regulation (EU) No 651/2014 of 17th June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty, the so-called General Block Exemption Regulation.

The programme allocation is divided into individual subprograms as follows: Subprogramme 1 - 15%, Subprogramme 2 - 50% and Subprogramme 3 - 35%.

Table 12. 1: Programme Budget [rounded to mil. CZK]

Year	2018	2019	2020	2021	2022	2023	2024	2025	Total
Total expenditure	272	509	818	917	917	917	867	498	5 715
Public funds	200	360	580	640	640	640	600	340	4 000
Non-public resources	72	149	238	277	277	277	267	158	1715

13. AMOUNT OF SUPPORT

An average total funding intensity of 70 % is expected for the programme. The maximum permissible funding intensity per project is set at 100 % or Subprogrammes 1 and 3 and at 80 % for Subprogramme 2. The funding intensity, determined as a percentage of the project's eligible costs, shall be calculated for each project, for each beneficiary and for each other participant separately; funding provided to undertakings under the Regulation shall not exceed the maximum allowable funding intensity specified therein.

Table 13. 1: Maximum allowable funding intensity rates for industrial research and experimental development by categories of participants

Categories of activities	Beneficiaries			
	Small enterprise*	Medium-sized enterprise*	Large enterprise*	Research organisations**
Industrial research	70 %	60 %	50 %	100 %

Industrial research In case of effective cooperation	80 %	75 %	65 %	100 %
Experimental development	45 %	35 %	25 %	100 %
Experimental development In case of effective cooperation	60 %	50 %	40 %	100 %
Innovation for small and medium-sized enterprises	50 %	50 %	-	-
Process innovation and organisational innovation	50 %	50 %	15 %***	100 %

Note: *Small and medium-sized enterprises are defined in Article 2(2) of the Regulation and its Annex I; large enterprises are defined in Article 2(24) of the Regulation.

** Research organisations are defined in Article 2(83) of the Regulation. The indicated aid intensity refers to research organisations' non-economic activities.

*** Aid to large undertakings for process and organisational innovation is eligible exclusively subject to the conditions stipulated in Article 29(2) of the Regulation.

Source: Regulation

14. ELIGIBLE AND RECOGNIZED COSTS

The aid shall be granted against the eligible costs of the project, i.e. the eligible costs which the provider approves, which are justified and remain within the amounts necessary for the purposes of the project. The applicant may suggest as eligible costs only costs defined in accordance with the Support of Research and Experimental Development and Innovations Act, and, in case of aid under the regime of public aid depending on the aid category, i.e. in accordance with the Regulation Article 25(3)(a),(b),(d),(e):

- *personnel costs*: researchers, technicians and other supporting staff to the extent employed on the project: the focus is on personal costs incurred by:
 - the applicant's/beneficiary's employees allocated to the project, i.e. researchers, technicians and other supporting staff to the extent employed on the project;
 - workers with whom the applicant/beneficiary has signed a short-term or long-term agreement for work directly related to the project;
 - scholarships for students participating in the project.
- *Costs of instruments and equipment* to the extent and for the period used for the project. Where such instruments and equipment are not used for their full life for the project, only the tax depreciation costs corresponding to the life of the project are considered as eligible.
- *costs of contractual research*, knowledge and patents bought or licensed from outside sources at arm's length conditions, provided that the transaction respected the competition rules without any irregularities, as well as costs of consultancy and equivalent services used exclusively for the project;

- *Additional indirect and other operating expenses*, including costs of materials, supplies and similar products, incurred directly as a result of the project.

Under Regulation Article 28, in the case of innovation funding for small and medium-sized enterprises subject to the conditions in Article 28(3) and (4), the following costs are eligible under Subprogramme 2:

- *costs for obtaining, validating and defending patents* and other intangible assets;
- *costs for secondment of highly qualified personnel* from a research and knowledge-dissemination organization or a large enterprise, working on research, development and innovation activities in a newly created function within the beneficiary and not replacing other personnel;
- *costs for innovation advisory and support services*

Under Regulation Article 29(3), in the case of funding for process and organisational innovation, subject to the conditions in Article 29(2) and (4), the following costs are eligible under Subprogramme 2:

- *personnel costs*;
- *costs of instruments, equipment, buildings and land* to the extent and for the period used for the project;
- *costs of contractual research, knowledge and patents* bought or licensed from outside sources at arm's length conditions;
- *additional overheads and other operating costs*, including costs of materials, supplies and similar products, incurred directly as a result of the project.

15. INCENTIVE EFFECT

As a provider and in order to meet the objectives of the programme and the conditions of the Regulation, TA CR shall assess the presence of the incentive effect of the funding under Article 6 of the Regulation as part of the initial evaluation of projects.

16. METHOD AND GENERAL CRITERIA FOR ASSESSING PROJECT PROPOSALS

The project proposals shall be comprehensively evaluated by the TA CR in accordance with the Support of Research and Experimental Development and Innovations Act. Each project proposal shall be evaluated by at least two independent external evaluators. In order to evaluate the project proposals applying for funding, the TA CR shall establish a specialized advisory body.

Suggested general criteria for assessing project proposals

- Compliance with the conditions of the call for proposals,
- Usefulness of the project and its contribution to meeting the programme objectives.
- The expected benefit and quality of the project outcome,
- The feasibility of the project and its implementation procedure.

More details on the evaluation of project proposals, scoring and the threshold values for individual evaluation criteria are set out in the relevant call for proposal documentation.

In order to assess possible duplicities, links, complementarities and synergies with various other projects and project proposals already implemented, the provider shall use data management and analytical tools.

17. SUBPROGRAMMES

To achieve its goal, the programme is divided into 3 subprogrammes based on their focus and scope of action, while assuming their mutual support and complementarity. A more detailed specification of each subprogramme shall be part of the call for proposal documentation for the relevant call for proposal.

17.1 Subprogramme 1 - Research in the public interest

Subprogramme 1 Objective and Focus

The aim of the subprogramme is to improve the management of the energy sector by public administration and to develop strategic and conceptual documents by supporting research and development in the field of energy with a view to supporting research and development projects in the public interest. This concerns in particular the support for research and development in the field of reliability and technological development of nuclear installations, energy regulation and other relevant areas of the energy sector.

One of the subprogramme's objectives is to support research and development in the field of safe and efficient operation and technological development of nuclear installations, which will lead, in the medium and long term, to meeting the need to monitor the safe and efficient operation of this energy sector.

Another objective of the subprogramme is to support research of the general impacts on society related to energy regulation and pricing. Further on, there is the liberalisation and decentralization process focused on re-shaping the European wholesale energy market and the impact of that process on the Czech Republic, the liberalization and integration of national markets and the impact on the Czech consumer, the wholesale and retail markets and the issues related to ensuring the flexibility of energy systems in the Czech Republic. From a wider perspective, the subprogramme should also address issues related to the vulnerable customer, energy poverty and energy literacy.

The subprogramme should further focus on supporting research of structural issues, which should contribute to an integrated view of the energy sector. Last but not least, the subprogramme should contribute to improving the management of the energy sector, as well as the creation and potential implementation of strategic and conceptual documents in the sector.

Budget for Subprogramme 1

An average funding intensity of 95 % is expected for the subprogramme. The maximum permissible funding intensity under Subprogramme 1 is 100 % of the total eligible costs of the project.

Table 17.1: Budget for Subprogramme 1 [rounded to mil. CZK]

Year	2018	2019	2020	2021	2022	2023	2024	2025	Total
Total expenditure	64	84	84	84	84	84	84	64	632
Public funds	60	80	80	80	80	80	80	60	600
Non-public resources	4	4	4	4	4	4	4	4	32

17.2 Subprogramme 2 - Strategic Energy Technology

Objective and Focus of Subprogramme 2

The aim of the subprogramme is to contribute in the medium and long term to meeting the vision of transformation and modernization of the energy sector in line with the approved strategic materials by supporting research, development and innovation in the field of energy technology and system components with a high potential for rapid application in new products, manufacturing procedures and services. In this respect, the subprogramme (and the programme as a whole) also reflects the need for a sectoral approach to energy.

The subprogramme reflects the wider framework of the Energy Union, and its fifth pillar in particular, focusing on research, development, innovation and competitiveness, especially through the European Strategic Energy Technology Plan. This subprogramme is one of the main instruments for fulfilling this pillar of the Energy Union. In the long run, the programme helps to implement the European climate and energy policy in the Czech Republic.

Within the subprogramme, priority should be given to energy technologies that enhance the competitiveness of the Czech economy, have a potential for exportation with high added value and also contribute to protecting the environment. The support should be concentrated into areas where research and development in the Czech Republic is already at European or world level, or where it can make significant use of competitive advantages (traditions, know-how, geographic conditions, existence of infrastructure, strong position on the international market, etc.).

The subprogramme should focus specifically on the technologies and structural elements in the field of improving the efficiency and reliability of energy production, the transmission and distribution systems; technological and structural elements of smart grids (measuring devices, software tools and systems, decentralized resources and their integration into the existing system); demonstration tools and technologies integrating the energy management sectors in line with the concept of smart cities and an emphasis on energy efficiency; technologies in the field of renewable or secondary energy sources; more efficient and environmentally friendly use of fossil energy sources, including technologies directly reducing not only greenhouse gas emissions but also other pollutants, or preventing their release into the atmosphere through energy conversion processes and promising technologies in the areas of highly efficiency production and heat and cold distribution; promising technologies for clean mobility; technologies related to energy storage and, last but not least, interdisciplinary technologies and research of structural elements.

Budget for Subprogramme 2

An average funding intensity of 60 % is expected for the subprogramme. The maximum permissible funding intensity under Subprogramme 2 is 80 % of the total eligible costs of the project.

Table 17. 2: Budget for Subprogramme 2 [rounded to mil. CZK]

Year	2018	2019	2020	2021	2022	2023	2024	2025	Total
Total expenditure	133	300	434	533	533	533	533	334	3333
Public funds	80	180	260	320	320	320	320	200	2000
Non-public resources	53	120	174	213	213	213	213	134	1333

17.3 Subprogramme 3 - Long-term technological perspectives

Subprogramme 3 Objective And Focus

The aim of the subprogramme is to support long-term technological perspectives in the energy sector, which will be implemented through research and development activities of research organizations in particular. These will include, among others, (generally long-term) applied research projects (including essential core activities of oriented research) that are not expected to be immediately applicable and which will support structural energy solutions.

The subprogramme focuses on research themes that are identified to bring about a new quality in the impact of the energy industry on society - energy security, environmental protection and social adequacy, which are the critical aspects of looking at energy reality. They will be selected in cooperation with organisations active in the energy sector, based on their long-term activities in the field and with regard to relevant European strategies. Extraordinary results of research teams in the relevant areas of research (e.g. specific nuclear materials - where the Czech Republic is a major player, energy of chemical bonds, new materials, new ways of using energy raw materials and research infrastructures) will also be taken into account when selecting research topics.

Research areas will be addressed through targeted research projects whose results are not required to guarantee quick marketing as they are characterized by their long development cycle. The subprogramme will also allow to respond to new energy challenges that may arise during the programme's duration. That is why the subprogramme will allow researchers to define the topics themselves, if those have emerged within a larger social debate in the given field.

Budget for Subprogramme 3

An average funding intensity of 80 % is expected for the subprogramme. The maximum permissible funding intensity under Subprogramme 3 is 100 % of the total eligible costs of the project.

Table 17.3: Budget for Subprogramme 3 [rounded to mil. CZK]

Year	2018	2019	2020	2021	2022	2023	2024	2025	Total
Total expenditure	75	125	300	300	300	300	250	100	1750
Public funds	60	100	240	240	240	240	200	80	1400
Non-public resources	15	25	60	60	60	60	50	20	350

18. COMPARISON OF THE CURRENT SITUATION IN THE CZECH REPUBLIC AND ABROAD

In 2015-2025, TA CR runs a programme in the Czech Republic to support applied research and experimental development entitled EPSILON; its second subprogramme focuses on achieving a sustainable energy mix, thus supporting a shift towards a more energy-efficient society. The implementation of the programme, especially the 1st public tender, was very limited due to the lack of funds in the national budget for the programme in the given year, which meant much less than satisfying its absorption capacity. The EPSILON programme followed the successful ALPHA programme, which is being implemented during 2011-2019. The last tender under ALPHA was announced in 2014 without any other being planned.

In 2015, the Ministry of Industry and Trade started their TRIO programme aimed at supporting applied research, among others also in the field of energy. The projects must, however, be linked to key enabling technologies and at the same time meet the NPOV objectives. Three public tenders are scheduled to be announced in 2015, 2016 and 2017 under this programme with a closing deadline by 2021 at the latest. Only projects with a maximum funding of CZK 20 million are eligible under TRIO; EPSILON expects an average amount of funding per project up to CZK 10 million. In the field of energy, financially challenging projects are to be expected (especially under Subprogramme 3), where the above amounts granted from the national budget may not be sufficient.

Another relevant programme is the Operational Programme Business and Innovation for Competitiveness (OP PIK), which is being implemented in the programming period 2014-2020. As part of the OP PIK, a programme called Applications is implemented, focusing on acquiring new knowledge through projects of industrial research and experimental development. Authorized beneficiaries of the Applications programme are enterprises and organisations for research and dissemination of knowledge.

The projects must comply with the objectives of RIS 3; furthermore, evaluations concentrate on whether the project's strategy falls under the scope of national RIS3 specialization, which actually includes, but is not limited to, energy (specifically "Production and Distribution of Electricity"). The programme is scheduled up to 2020. In the first call, an allocation of CZK 2 billion was announced, CZK 40 million in the second, and an allocation of CZK 4.5 billion is planned for the third call. A total of CZK 6.54 billion is thus to be used in those three calls, which is approximately 77% of the programme allocation. Before launching the THETA programme, then, the Application allocation shall have been used.

At EU level, the main mechanisms for supporting energy research and development reflect the founding and the amending treaties shaping today's EU. These mechanisms are (i) Framework Programmes For Research and Technological Development (the last one with this name was the 7th Framework Program - 2007-2013, the current equivalent is Horizon 2020 for 2014-2020); the Research Fund for Coal and Steel (RFCS) and the Euratom Research and Training Programme.

The importance of energy research is demonstrated by the fact that the budget for this part increased by 41% in the 7th Framework Programme (to EUR 2.3 billion excluding Euratom) compared to the 6th Framework Programme. Another radical increase has occurred in Horizon 2020, where the value of energy-oriented R&D amounts to nearly EUR 8 billion. There is a typical increase in pilot and demonstration projects, which are usually defined by European Technology Platforms (ETPs) and European Industrial Initiatives (EIs).

Under Horizon 2020, energy (Secure, clean and efficient energy) is primarily a societal challenge, but it also includes other components - such as Excellent Science (for example FET - Future and Emerging Technologies) and Industrial Leadership (such as advanced materials or access to risk financing for small and medium-sized enterprises).

Energy in the area of social challenges has three main components: (i) energy efficiency, (ii) low carbon technologies (including renewable resources), and (iii) smart cities. These three parts are complemented by many other areas, a large part of which comes from a previously separate programme called Intelligent Energy for Europe (now absorbed by Horizon 2020).

Energy under Horizon 2020 is part of other mechanisms that are still under-utilized by entities from the Czech Republic - public-public partnerships (mainly the ERA-Net Cofund mechanism) and public-private partnerships (mainly the Hydrogen and Fuel Cells Joint Technology Initiative). There is also a separate support mechanism called EIT (European Institute for Innovation and Technology) and its Knowledge Innovation Communities (KICs), which have been in place since 2010.

The participation of Czech entities in the European mechanisms of support for research and development is insufficient or unbalanced. It is traditionally excellent in the Euratom part; in other areas, however, it is very inadequate. Entities from the Czech Republic participated in 23 projects under the 7th Framework Programme, while in the Fission part of the Euratom programme it has been in 71 projects (largely represented by ÚJV Řež). The participation of Czech entities in RFCS is negligible. Under Horizon 2020, entities from the Czech Republic are involved in a total of 22 projects, but most often in the form of CSA (Coordination support action), which are predominantly educational and good practice projects. There is an ordinary presence in the former Intelligent Energy for Europe mechanism (thanks to consulting companies in the field of energy savings). That is also why the THETA programme makes it possible to involve Czech research teams in European programmes supporting R&D&I in areas compliant with the focus of the programme.

There are research and development support programs such as THETA in many European countries. For example, Austria sets its core objectives related to energy research and development so as to meet the commitments associated with the climate and energy policy. The Climate and Energy Fund (co-managed by two ministries: BMVIT - Transport, Innovation and Technologies and BMLFUW - Science, Research and Economics) has been the main source of funding for energy research and development since 2007. The core programs are E! Mission (primarily focusing on prospective technologies, so it is the equivalent of THETA's Subprogramme 3, energy efficiency and savings, renewable energy sources, smart grids and energy storage), Smart cities and City of tomorrow programmes and a programme focusing on the key aspects of future mobility, with a special emphasis on electromobility.

In Germany, support for research and development (including energy R&D) has always been prominent, given the country's industrial character. Energy support was reallocated due to the Energiewende. The German support for energy research and development reached approximately EUR 3.5 billion in the period 2011-2014. The key programs are the Joint Initiative for Energy Storage, the Joint Initiative for the Future of the Grids and the National Innovation Programme for Hydrogen Technologies and Fuel Cells (NIP), a public-private partnership.

In Sweden, there has been a dramatic increase of public support for R&D in 2009-2011, primarily owing to the funding of demonstration projects. Sweden has become an innovative leader in several areas, such as smart grids, the second generation of liquid biofuels, and, surprisingly, also in the field of carbon capture and storage (CCS). The Swedish Energy Agency has many programs covering electromobility, smart grids, structural studies (general energy structure studies, which is a direct equivalent of THETA's Subprogramme 1), renewable resources (biomass, hydropower, previously also the solar energy - later found to be rather inefficient) or energy savings.