



APPENDIX 4

Investment proposal submission form for priority investments

Investment proposal submission form for priority investments

16/07/2021

Revision 1

MODERNISATION FUND – Accelerating the transition to climate neutrality

✉ modernisation-fund@eib.org

<https://modernisationfund.eu/>

Appendix 4 Investment proposal submission form for priority investments

for submission of the information on priority investments in accordance with
Article 10d(2) of ETS Directive¹

1. Submission information		
1.1. Targeted Investment Committee ²	S2/2021	
1.2. Priority order for assessment of priority investments ³	<p>By Submission Date - Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p> <p>If NO or for proposals submitted in batches: Please specify Priority Order</p> <p>P-1: Scheme (Part A – Priority) Modernization of energy sources <i>of the Programme HEAT (CZ)</i></p> <p>P-2: Scheme (Part A1 – Priority): Modernization of energy sources <i>of the Programme ENERGETS (CZ)</i></p>	
1.3. Is the proposal a scheme? If yes, please fill in Annex 1 of this Form. If no, please fill in Annex 2 of this Form.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

¹ Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Union and amending Council Directive 96/61/EC with amendments (ETS Directive)

² Please provide the targeted Investment Committee date in form of semester Sx and year.

³ As per article 4.3 of the Implementing Regulation.

2. Authority responsible for the implementation of the Modernisation Fund

2.1. Name	State Environmental Fund of the Czech Republic
2.2. Address	Olbrachtova 2006/9, 140 00 Praha 4, Czech Republic
2.3. Website	https://www.sfzp.cz/en/
2.4. Main contact:	
Name	Ivo Marcin
Position in the Organisation	Director of the Department of the State Fund Strategy and International Cooperation
Email	ivo.marcin@sfzp.cz
Telephone Number	+420 267 994 148
Mobile Number (optional)	+420 736 756 015

3. General information	
3.1. Title of the investment	Scheme (Part A1): Modernisation of energy production <i>priority investments of the Programme ENERG ETS (Improvement of energy efficiency and reductions of emissions of greenhouse gases in EU ETS industry)</i>
3.2. Scheme managing authority (as indicated in Annex 1 or 2)	State Environmental Fund of the Czech Republic (hereinafter also "SEF")
3.3. Beneficiary Member State	Czech Republic
3.4. Priority area(s) based on Article 10d(2) of EU ETS Directive	<input checked="" type="checkbox"/> generation and use of electricity from renewable sources, <input checked="" type="checkbox"/> the improvement of energy efficiency (excluding energy efficiency in transport, buildings, agriculture and waste), <input checked="" type="checkbox"/> energy storage, <input type="checkbox"/> modernisation of energy networks, <input checked="" type="checkbox"/> just transition in carbon-dependent region, <input type="checkbox"/> energy efficiency in transport, <input type="checkbox"/> energy efficiency in buildings, <input type="checkbox"/> energy efficiency in agriculture, <input type="checkbox"/> energy efficiency in waste.
3.5. Total investment costs (with and without VAT) (EUR)	<i>Total investment costs:</i> <ul style="list-style-type: none"> • 223,586,957 EUR with VAT and • 184,782,609 EUR w/o VAT
3.6. Total support from the Modernisation Fund for a scheme (EUR)	<i>Total support for the scheme:</i> <ul style="list-style-type: none"> • 85,000,000 EUR
3.7. Requested amount for the first disbursement from the Modernisation Fund (EUR)	Requested amount for the first disbursement: <ul style="list-style-type: none"> • 30,000,000 EUR

3.8. Please provide a NACE4 code for the economic activity (More than one code may be relevant in some cases).	Code	Pro-rata share of overall investment (%)
	C.23 Manufacture of other non-metallic mineral products	30%
	C.24 Manufacture of basic metals	20%
	C.20 Manufacture of chemicals and chemical products	10%
	C.22 Manufacture of rubber and plastic products	10%
	C.25 Manufacture of fabricated metal products, except machinery and equipment	10%
	D.35 Electricity, gas, steam and air conditioning supply	5%
	C.16 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	5%
	C.17 Manufacture of paper and paper products	5%

⁴ Revision 2 classification system of economic activities established by Regulation (EC) No 1893/2006 of the European Parliament and of the Council

	C.10 Manufacture of food products	5%
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Please provide enough detail in this Form to enable the EIB to clearly understand what the project will do, how the project will be delivered, the impact it will have and how it will meet the requirements set out in the Directive 2003/87/EC and Implementing Regulation (EU) 2020/1001.

Please be as concise as possible. Please note any supplementary information you provide will not be reviewed⁵.

⁵ Except information explicitly requested by this Proposal Form, or additionally by the EIB during the investment appraisal process.

Summary information about the scheme	
Support Programme	Improvement of energy efficiency and reductions of emissions of GHG in the EU ETS industry (ENERG ETS)
Support sub-area	Priority projects defined in the Programme ENERG ETS
Supported activities	Modernisation of energy sources and fuel base switch in EU ETS industry, with primary objective of decommissioning of coal-fired energy sources, in particular reconstruction or replacement of the energy source with a change of the fuel used or type of energy to renewable energy sources with high-efficiency CHP.
Eligible beneficiaries	Operators of EU ETS facilities in the Czech Republic
Type of support	Grant
Maximum amount of support	15,000,000 EUR
Basic outputs expected	<ul style="list-style-type: none"> • <i>no. of projects supported:</i> 9 • <i>total amount of support granted:</i> 85,000,000 EUR • <i>total investments:</i> 184,782,609 EUR without VAT; 223,586,957 EUR incl. VAT • <i>total CO₂ emission reduction:</i> 1,012 kt CO_{2eq} (2.3% of the National Energy and Climate Plan target) • <i>total energy savings:</i> 2.9 PJ (2.4% of the National Energy and Climate Plan target) • <i>no. of jobs created:</i> up to 7 in direct employment and 25 additional

List of annexes to the scheme:

Annex A – Modernisation of heat sources in the heating and industrial sectors in the Czech Republic

Annex B – Supporting low-carbon transition of the Czech Republic by EU ETS Funding Mechanisms

Annex C – Analysis of the project's compliance with the rules for the provision of public aid

Annex D – Excel calculations of costs and savings

Annex E – Analysis of project intentions submitted under the preliminary call

Annex F – Statutory declaration – Declaration of compliance

Annex G – Market analysis in the industrial sector (Enviros, November 2020)

4. General description of the investment (Annex I, points 1.1, 1.2 and 1.10 of the IR⁶)

4.1. Please briefly describe what investment objectives are, including the impact it will have in the area and/or on project participants. Describe the short, medium and long-term results/impacts that the investment will deliver and how this will be measured.

Please link to SMART (specific, measurable, achievable and time-constrained) objectives. Please demonstrate how the investment will contribute to 2030 climate and energy framework objectives of the Member State and the long-term objectives as expressed in the Paris Agreement as required by the BMS National Energy and Climate Plans (NECP). Please also elaborate as to whether the proposal supports the national Just Transition Plan (JTP) and/or national RRP (Recovery and Resilience Plans).

Please include information on: (a) the expected energy saved in MWh (for a typical full year of the investment operation); (b) the greenhouse gas emissions to be saved in equivalent tCO₂ (for a typical full year of the investment operation); (c) the additional renewable energy capacity installed, if applicable.

Investment objective of the present scheme, consistent with the aims of the 2003/87/EC Directive, is the improvement of energy efficiency. In line with article 10d of the above-mentioned Directive, no measures aiming at energy efficiency relating to energy generation using solid fossil fuels would be supported. Increasing energy efficiency will lead to savings in primary energy consumption and, among other things, it will lead to increasing the number of renewable energy sources and a reduction in greenhouse gas emissions (specific values of these contributions please see below in this section).

The aim of the investment is to increase energy efficiency and/or reduce greenhouse gas emissions primarily through changing the fuel base (and modernisation – replacement or reconstruction) of energy sources used for production of energy in industry installations covered by the EU ETS. Reduction of GHG emissions in the installations under the European Emissions Trading Scheme (EU ETS) is a key instrument of the EU climate policy as it covers around 40 % of the EU's GHG emissions. As stated in the NECP (National Energy and Climate Plan), the European target is set at 43 % compared to 2005 in the sectors covered by the EU ETS, and at 30 % in sectors outside the EU ETS. The main target of the Czech Republic is to reduce the total emissions of greenhouse gases by 30% by 2030 (compared with 2005), which corresponds to emission reductions of 44 Mt CO_{2eq} (for 2020, the goal was 32 Mt CO_{2eq}, i.e. 20% in comparison to 2005). Within the energy efficiency dimension for the period 2021-2030, the Czech Republic has three objectives:

- a) to reach primary energy sources at the level of 1,735 PJ,
- b) final consumption at the level of 990 PJ and
- c) energy intensity of GDP at the level of 0.157 MJ / CZK in 2030.

The Czech Republic has chosen as its main goal the goal expressed in terms of energy intensity of GDP. However, the projects will also contribute to other objectives in the field of air quality improvement as set out in the expected performance of the indicators (see below).

The short-term goal of this scheme is creating of a perspective for the operators of installations in EU ETS industry sector that there is an instrument designed for support of investments in low-carbon technologies

⁶ IR – Implementing Regulation (EU) 2020/1001

which is rather ambitious and strict regarding the projects eligibility. Thus, the investing environment will shift from renovation of coal-fired units towards technologies with lower carbon footprint. Partially, this goal was achieved as the last coal-fired investment in the EU ETS sector took place around the year 2017. Now this scheme should send a clear signal that low carbon investments in the heat generation is the only option possible.

The medium-term goal is supporting of projects of fuel switch, renovation of industrial energy systems and accumulation technologies, which would bring significant reductions of GHG emissions and increased energy efficiency throughout the period 2021-2030, so that they contribute to achievement of abovementioned NECP targets. These targets are likely to be refined due to increased EU climate ambition and the „Fit for 55“ package, but this scheme represents a major contribution to these targets as energy consumption in the EU ETS sector is responsible for large share of emissions (app. 13 mil. tCO₂ per year). The projects will be accompanied with estimates of emission reductions by accredited energy auditors, and the drop in emissions is expected to be evident also from the EU ETS annual emission reports.

The long-term goal is to achieve complete coal phase-out in the EU ETS industry sector. This scheme ensures that any project supported will be paired with decommissioning of any coal-fired units in the sector by 2035. The declining number of coal-fired installations in the EU ETS should be obvious in the annual reports according to Art. 21 of the Directive 2003/87/EC.

In line with the national and European strategic goals discussed above, the measures of **modernisation of energy sources and fuel base switch in EU ETS industry, with primary objectives of improvement of energy efficiency and decommissioning of coal-fired energy sources** (see more details in section 4.6); they translate into the following contributions:

Potential scheme energy savings:	2.9 PJ (2.4% of the NCEP target)
Potential scheme GHG emission reductions:	1,012 kt CO_{2eq} (2.3% of the NCEP target)
Energy saved per deployed investments:	15.5 TJ/mEUR
Emissions abated per deployed investments:	5,504 tCO₂/mEUR
Renewable energy capacity installed:	315 MW_t; 99 MW_e
Number of jobs created:	up to 7 direct & 25 additional (see details in 4.6)
(more detailed information on contributions within the scheme are presented in Annex D and also in sections 4.5 and 6.2)	

The proposed scheme is closely coordinated with preparations of the national Just Transition Plan (JTP), managed in the framework of the Operational programme Just Transition (financed from the Just Transition Fund) by the Ministry of the Environment of the Czech Republic in cooperation with SEF as an operator and projects administrator. The Czech JTP focuses on three coal regions (NUTS 3 Karlovarský, Moravskoslezský and Ústecký regions). Coal regions have **spacious areas affected by mining** (more than 70% of these areas are located in coal regions). The most affected is the Ústecký region with large surface lignite mines. The transition of an energy sector is/will be an integral part of regional plans and JTP. Both Modernisation fund and Just Transition Fund will provide financial support to this objective, and clear demarcation is set:

- **Modernisation fund** focuses on energy efficiency GHG reduction and modernisation of energy systems (as e.g. in this scheme);
- **Just Transition Fund** addresses the impacts of the transition – it will support companies creating green jobs or employees coming from the coal industry, and it will help to recover land needed for new investments into renewable sources.

It is also important to state that the majority of ETS installations are located in the coal regions. Therefore the scheme itself has a strong focus on the just transition. In order to provide coal regions with the needed support, there will be a reserved financial allocation of 30 % for the coal regions under this scheme. According to our preliminary call for project intentions, 47 % of submitted project proposals are coming from regions mentioned above.

The coordination with the **national RRP** is also on a high level. The body responsible for RRP is the Ministry of Industry and Trade. Its representatives are members of a committee and all working groups related to Modernisation fund. It should also be recalled that the RRF cannot support EU ETS entities.

4.2. Please specify targeted beneficiaries⁷.

Modernisation fund Operator / Beneficiary

Modernisation fund operator / beneficiary is the State Environmental Fund of the Czech Republic (SEF). SEF is a special fund established by the law (Act no. 388/1991 Coll.). The primary purpose of the SEF is to support measures improving the quality of the environment. SEF will distribute grants from the scheme to final beneficiaries. SEF as the institution responsible for Modernisation fund implementation administrates final beneficiary's applications, disburses grants to the final beneficiaries, and audits supported projects.

Financial capacity

SEF's budget is independent of the state budget and has its own income from environmental fees (around 60 mil. EUR per year⁸). Revenues from own economic activity (mainly interests from loans) are insignificant. SEF is also beneficiary of technical assistance to cover incurred costs of administration OP Environment and New Green Saving programme (around 13 mil. EUR per year). The total volume of the administrated grants and loans was 572 mil. EUR in 2019. Modernisation fund resources are SEF's income according to the law (Act no. 383/2012 Coll. – national transposition of ETS directive). SEF's own resources will cover administrative costs of this scheme implementation.

Administrative capacity

SEF has more than 550 employees. There is a coordination unit of Modernisation and Innovation fund. Project administration is provided by the Section of Energy and Climate projects' implementation. Horizontal issues (i.e., legal services, financial control) are covered by the economic section and legal section for all programmes. The organizational scheme of SEF can be downloaded from the Internet⁹. The State Environmental Fund of the Czech Republic has a long-term experience in the administration of support for environmental measures. In the present time, the SEF administers several financial programmes, e.g. Operational programme Environment (financed by Cohesion Fund and European Regional Development Fund), National programme Environment (financed from the budget of SEF); New Green Savings programme (funded by the State budget from emission allowances revenues); and Norway grants. Besides these programmes, the Fund will also administer support from the Just Transition Fund.

The Ministry of the Environment of the Czech Republic chairs the Czech Modernisation fund Committee as an advisory body to Minister. The Committee consists of representatives of the Ministry of Industry and Trade, Ministry of the Environment, Ministry of Finance and the SEF. It has a leading role in the implementation of the Modernisation fund in the Czech Republic.

⁷ Beneficiary - an operator, body or firm, whether public or private, responsible for initiating and implementing operations.

⁸ 3-years average 2017-2019. More on <https://monitor.statnipokladna.cz/ucetni-jednotka/00020729/prehled> [partially in English]

⁹ See https://www.sfzp.cz/wp-content/uploads/2021/03/Organizacni_struktura_03-2021.pdf

The Platform of the Modernisation fund serves as an intermediary for communication with other stakeholders. *Detailed institutional arrangements and a description of the responsibilities and competencies of the implementing body is included in the General Programme Document for the Implementation of the Modernisation fund in the Czech Republic (please see section 4.3 and [web](#)).*

Final beneficiaries

The final beneficiaries targeted by the scheme are entities operating the EU ETS installations in the Czech Republic.

Based on the analysis of submitted projects intentions, mostly measures on installations in the steel industry, chemical industry, and production of building materials are expected. *An updated list of facilities in the EU ETS is published on the [website](#) of the Ministry of the Environment.*

4.3. Please briefly demonstrate the need for the investment.

When the investment contributes to implementation of a territorial just transition plan, please provide information about the expected contribution of the investment to that plan.

The emission intensity, i.e. the emission intensity of GDP, is higher in the Czech Republic compared to the EU average, due to the higher share of industry in GDP generation and the higher emission intensity of energy production, industry and transport. In comparison to the EU average, the Czech Republic has higher specific emissions of greenhouse gases per capita (in 2019, it was 12.4 t CO_{2,eq}/capita compared to 8.7 t CO_{2,eq} in the EU). The key sources of industrial emissions are the combustion of fuel for manufacturing process heat (representing 52% of industrial emissions in the EU), and greenhouse gases emitted while processing feedstocks (48%), such as CO₂ produced when natural gas is converted to hydrogen to make ammonia for fertilizers, or during the reduction of iron ore to make steel.¹⁰

In the field of renewable energy sources, the Czech Republic aims to achieve the share of RES in gross final consumption of 22% by 2030, which is 9 percentage points higher than the 2020 target.

Moreover, under Directive 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources, an indicative target in year-on-year growth of the share of RES in the heating and cooling sector by 1.1% is also set, at the level of the average value in the period 2021-2030.

As there is currently no other support available for decarbonisation of EU ETS facilities in the Czech Republic, the Modernisation fund can be the only fund to cover companies of all sizes, including within the EU ETS in the territory of the Czech Republic.

The Emission Trading Act 383/2012 Coll., implementing the Emission Trading Directive 2003/87/EC including the Article 10d, states that the Modernisation Fund shall be used to finance projects to reduce greenhouse gas emissions, use renewable energy sources and increase energy efficiency, and appoints the SEF as implementing body.

Under the Structural Reform Support Service, the Ministry of Environment of the Czech Republic applied a project for suggesting the modalities and application of the Modernisation fund in the Czech Republic. In this

¹⁰ McKinsey & Company, Pathways to decarbonize the Czech Republic, Carbon-neutral Czech Republic 2050, Hanzlík, V., Javůrek, V., Smeets, B. & Svoboda, D., November 2020.

project the European Commission contracted a consortium of ICF and Enviros to deliver recommendations for the modalities of the Modernisation fund aiming development of its implementation in the Czech Republic. Based on the outcomes of the project, on 25th January 2021, the Czech Government adopted a **General Programme Document for the Implementation of the Modernisation fund in the Czech Republic** (available [here](#)), describing 9 areas of support including this particular ENERG ETS scheme. ICF recommended to provide grants for projects of fuel switch from fossil fuels to less carbon intensive fuels in industry as a programme with the third most important impact (for more details see Annex B).

In order for the Czech Republic to achieve the long-term EU goals in the field of decarbonisation 2050, specific types of measures are being considered for this priority scheme (for details see Annex A and section 4.5) that best meet the objectives of the Modernization Fund, show the required contributions to the goals described in section 4.1 and do not exceed the set cost-effectiveness limits.

The priority measures selected comply with the aims of the 2003/87/EC Directive regarding improvement of energy efficiency.

Modernisation of the industrial sector and its transition to less energy demanding, intensive and yet environmentally and climate friendly technologies is a necessary process that most industrial facilities in the Czech Republic must undergo in order to maintain their competitiveness in a dynamically developing environment. Importance of the investment results from a large share of industry in GDP generation. Another reason is that the industrial companies need to contribute to the overall climate and energy targets set on the level of the Czech Republic and the EU by 2030. Energy installations falling under the scope of industry are in process of switching from coal as it has been concluded by the Czech Coal Commission in 2020. Financing of measures to decarbonise industries falling into the EU ETS is also hampered by the unavailability of appropriate supporting tools.

Decarbonisation of the Czech industry

The main tool for reducing greenhouse gas emissions in industry and energy has been the European Emissions Trading Scheme since 2005. It aims to reduce emissions rapidly by 2030 compared to 2005. Thanks to the intensive industrial transformation that has taken place in our country since 1990, the situation is getting better. With the help of ambitious scenarios, the Czech Republic is aiming for an 80% reduction by 2050. However, at the moment, the conditions for achieving this goal are not clear.

Decarbonisation of the Czech industry is difficult, unlike sectors such as transport and energy. There are four technical barriers to reducing industrial greenhouse gas emissions:

- Reducing emissions from feedstocks usually requires a change in production processes.
- Not all technologies for emission-free high-temperature heat production are already commercially available. For example, in cement production, where kilns reach operating temperatures of more than 1,400°C, electrical technologies of the appropriate size are not available.
- Industrial processes are highly interconnected and can rarely be changed on their own.
- There are few natural opportunities for large, costly redevelopments and renovations, as the lifespan of systems often exceeds 50 years.

And there is even more: factors such as the *rising price of emission allowances* (where the current price of allowances exceeded EUR 50 per tonne of emissions emitted), the *reduction in free allocation to vulnerable sectors* and the planned *reduction in the number of sectors* that can claim compensation for rising electricity

prices make it very difficult to meet the ambitious vision. Rising energy prices, the cost of acquiring new technologies and rising prices of emission allowances are factors that have a strong impact on investment in Czech industry.

The increase in costs that Czech industry, unlike competitors from third countries, already have to bear today, poses a serious threat to *competitiveness*. Demand for the products of Czech companies in Europe and in the world will not disappear, but production will move elsewhere and will be more energy-intensive and often more harmful to the environment. In addition to global environmental impacts, the relocation of production, given the high share of industry in GDP in the Czech Republic, would also have a strong impact on *employment* (especially in industrial regions), *state budget revenues*, *tax collection* and *social cohesion*.

Carbon leakage¹¹ will mainly affect energy-intensive industries. These include, for example: mining industry, food industry, textile industry, paper industry, chemical industry, construction industry, automotive and metallurgical industries.

The Czech industry wants to contribute to climate protection. However, in addition to a clear and consistent industrial policy that would set the framework for a realistic industrial transformation, financial support from various national and European sources, reduction of network costs of large companies, immediate introduction of maximum compensation for indirect costs of EU ETS, and support of the Czech Republic for the introduction of a carbon tax on imported "dirty" (non climate-friendly) products are essential within the borders of the EU for products of a sector at risk of carbon leakage.

Regarding **investment needs**, a survey performed in the framework of the call for project proposals is included in Annex E.

According to the study "Pathways to decarbonize the Czech Republic"¹² by McKinsey & Company, investment costs for reducing CO₂ emissions through electrification of industry by 2030 are estimated in the amount of approximately 995 mEUR. However, these are costs associated mainly with the metallurgical sector, hence the costs of electrification of other sectors would further increase this estimate.

Due to high energy intensity in the Czech Republic, the sector of EU ETS installations is threatened by high CO₂ costs and consequent carbon leakage. This presents the highest market risk for the sector of EU ETS industry in the Czech Republic.

"Adopting more costly low-carbon processes may put producers at a competitive disadvantage if others do not implement similar changes. Furthermore, many manufactured products in the Czech Republic are commodities competing for price in

¹¹ Carbon leakage is defined as an increase of emissions outside the EU because of EU impact of climate policies and replacement of specific production out of the EU. As such policies affect the costs of economic activity, especially in energy intensive industries, they might cause companies to move production to countries with laxer greenhouse gas emission policies.

¹² See here: <https://www.mckinsey.com/cz/our-work/pathways-to-decarbonize-the-czech-republic>

an international market where increased production costs cannot feasibly be passed onto customers.” (McKinsey & Company report¹³)

So as to contribute to implementation of territorial just transition plans, financial allocation of 30% for the coal regions will be reserved under this scheme (see Annex 1, section 2.5), making a contribution to the priority area “just transition in carbon-dependent region” based on Article 10d(2) of the 2003/87/EC Directive.

For better coherence, the programme ENER G ETS has been split into two smaller schemes with more homogenous projects and technology focus. This particular scheme aims at priority projects only, i.e. fuel switch from fossil fuels to RES (in high-efficiency CHP).

Along with the above mentioned background substantiation, the SEF launched a call for registration of project intentions at the turn of the years 2020/2021, collecting large database of projects which will be submitted once the call for proposals is launched. On the basis of the preliminary call for project intentions (see Annex E) the budget of the scheme was established. Therefore, the figures used in this scheme are well substantiated.

4.4. Please briefly explain what options were analysed to achieve investment objectives. Please explain why the chosen investment is the most cost effective in achieving investment objectives.

On the basis of an expert study (Annex A), analysing the state of the Czech industry, only such investments and technical solutions were proposed that will lead to fulfilment of the goals identified in point 4.1 and will help to meet the ambitious European climate objectives by 2050.

The following biomass and biogas technologies have been considered (details please see section 4.5) which reduce the use of fossil fuels, comply with the European Commission's directive, are cost-effective in terms of reducing CO₂ emissions and also show a high level of cost-effectiveness from the point of view of energy efficiency.

The proposed investments (see section 4.5) have been chosen in view of superior cost-effectiveness and achievement of the investment objectives.

Projects are also chosen on the basis of eligibility criteria. Projects which would meet these criteria will be supported on a first come, first served basis. With this approach, the project proponents have clear view of what criteria they need to meet so they take it into account during the project preparation and they know in advance which support they can receive from the Modernization Fund.

Various options of use of Modernisation fund's financial resources were analysed by ICF (Annex B). The ICF study suggests the possibility of large savings in industrial sector, which correlates with the high energy intensity and corresponding high share of CO₂ emissions of the Czech industry. The consultants have stated that an important part of industrial installations is dependent on fossil fuels that have a significant share in the emission load which lends support to the implementation of the Modernisation fund in this sector.

¹³ McKinsey & Company, Pathways to decarbonize the Czech Republic, Carbon-neutral Czech Republic 2050, Hanzlík, V., Javůrek, V., Smeets, B. & Svoboda, D., November 2020.

The cost-effectiveness requirement is further met by defining a counterfactual investment in order to determine the amount of eligible expenditure. Counterfactual investments applicable under this scheme have been discussed with the European Commission and are detailed in Annex C – *Analysis of compliance with state aid rules*.

4.5. Please briefly describe the scope of the investment proposal (technologies, main parameters, capacities, mass and energy balances, scope of works/supplies, related infrastructure).

Please provide evidence that the proposed technology/ies are mature (actual system proven in operational environment under comparable conditions and scale and with available references).

The scheme relates to reduction of primary energy consumption and/or reduction of CO₂ emissions through modernisation (reconstruction or replacement) of equipment for combined electricity and heat production, leading to increased energy efficiency or replacement of solid fossil fuel (usually coal) by renewable energy.

Detailed analysis of benefits according to individual technologies is included in Annex D; below, only summary contributions for groups of measures are presented:

Reconstruction or replacement of energy source in industry with a change of fuel used or type of energy to renewable energy sources (biomass, steam turbine) in high-efficiency cogeneration of heat and power:

Number of expected projects with this measure	Emission reductions [ktCO ₂ /year]	Primary energy savings [TJ/year]	Reduction of CO ₂ emissions	Reduction of consumption of primary non-renewable energy
7	789	1,788	min. by 20%	min. by 10%

Reconstruction or replacement of energy source in industry with a change of fuel used or type of energy to renewable energy sources (biomethane, engine) in high-efficiency cogeneration of heat and power:

Number of expected projects with this measure	Emission reductions [ktCO ₂ /year]	Primary energy savings [TJ/year]	Reduction of CO ₂ emissions	Reduction of consumption of primary non-renewable energy
1	192	934	min. by 20%	min. by 10%

Reconstruction or replacement of energy source in industry with a change of fuel used or type of energy to renewable energy sources (biogas, engine) in high-efficiency cogeneration of heat and power:

Number of expected projects with this measure	Emission reductions [ktCO ₂ /year]	Primary energy savings [TJ/year]	Reduction of CO ₂ emissions	Reduction of consumption of primary non-renewable energy
1	32	135	min. by 20%	min. by 10%

Heat energy storage systems can only be supported as part of a comprehensive project specified above.

Expected number of projects with this measure	Heat capacity/output [MWh/MWt]	Total storage capacity [MWh]	Specific costs [mEUR/MWh]
1	0.24	9.2	0.028

In the table below, suitable technologies for low-carbon energy transition considered as the most relevant in the Czech Republic are presented.

1. Priority measures grounded in switching to biomass	
1.1 Block/unit consisting of :	- biomass fired grate steam boiler - steam turbogenerator with back-pressure turbine with steam extractions for technological needs, or for heat supply systems
1.2 Block/unit consisting of :	- biomass fired grate steam boiler - steam turbogenerator with condensing turbine with regulated steam extractions for technological needs or heat supply systems
1.3 Block/unit consisting of:	- biomass fired fluidized bed steam boiler - steam turbogenerator with back-pressure turbine with steam extractions for technological needs, or for heat supply systems
1.4 Block/unit consisting of:	- biomass fired fluidized bed steam boiler - steam turbogenerator with condensing turbine with regulated steam extractions for technological needs or heat supply systems
2. Priority measures grounded in switching to bio-methane or biogas	
2.1 Cogeneration engine consisting of :	- piston engine with generator (CHP) - engine cooling system composed of a system of exchangers transferring the removed heat for technological needs or heat supply systems

→ Detailed budget itemization is discussed in section 6.1 ←

General eligibility criteria of investments in view of meeting medium and long-term national goals

The project must not be in conflict with the outputs of the air quality improvement program for the relevant zone or agglomeration and the National Emission Reduction Program prepared in accordance with the Air Protection Act.

The following types of projects are not supported:

- implemented outside installations in the EU ETS,
- implemented within the heat supply network pursuant to Act No. 458/2000 Coll. on Business Conditions and the Performance of State Administration in the Energy Sectors and on Amendments to Certain Acts (Energy Act),
- when disconnection from heat supply networks takes place,
- installation of photovoltaic power plants, including the related accumulation of energy produced,
- reducing the energy intensity of office buildings,
- which **use solid fossil fuels in any way**,
- reduction of energy consumption within energy source combusting hard coal or lignite or another solid fossil fuel with a high CO₂ emission factor,

- measures in energy sources for which the consumption of coal or any other fuel with a high CO₂ emission factor will not be terminated after project completion.

Other conditions of support:

- The project implementation period must not exceed 5 years from the moment of project approval.
- The project must be realized in the Czech Republic.
- The applicant must not be a company in difficulty (as per Commission Regulation (EU) No. 651/2014).
- The applicant must not be bankrupt, in liquidation, have no overdue liabilities to state and public budgets, arrears of taxes and it must not be a company with a conflict of interest (as per Act No. 159/2006 Coll., on conflicts of interest, as subsequently amended, including the restrictions set out in Section 4c of the Act; if the applicant is a legal entity, its ownership structure and actual owners must be documented in the sense of Act No. 253/2008 Coll., on selected measures against legitimization of proceeds of crime and financing of terrorism, as subsequently amended.).
- The stationary source for which support is requested must be operated in full compliance with Act No. 201/2012 Coll., On Air Protection and on Amendments to Certain Other Acts, as amended (hereinafter referred to as the "Air Protection Act").

Outcomes: minimum requirements for investments in view of meeting medium and long-term national goals

If the project addresses both the reduction of CO₂ emissions and energy savings (reduction of primary energy consumption), all relevant specific costs must be met.

For modernisation (reconstruction or replacement) of equipment for the production and distribution of energy for own consumption, the project completion must achieve the following quantitative parameters:

- either reduction of CO₂ emissions by min. 20%, while the specific eligible expenses of the project may not exceed EUR 3,063 without VAT/t CO₂ per year,
- or reduction of unit CO₂ emissions per unit of production min. by 25%, while the specific eligible expenses of the project may not exceed EUR 3,063 without VAT/t CO₂ per year, calculated for the scenario where emissions after the implementation of the project will be considered in the same amount as before its implementation,
- or reduction of primary energy consumption min. by 10% compared to the initial state, while the specific eligible expenses of the project may not exceed EUR 957 without VAT/GJ per year,
- or reduction of the unit consumption of primary energy per unit of production min. by 15%, while the specific eligible expenses of the project may not exceed EUR 957 without VAT/GJ per year, calculated for the scenario where energy consumption after the implementation of the project will be considered in the same amount as before its implementation.

In the case of a project for the use of biomass fuels, it is necessary to comply with the sustainability criteria according to Article 29 of Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of energy from renewable sources.

In the case of a project for the use of fuels from biomass, as a transition from natural gas, the following conditions are defined:

- projects for stationary combustion sources covered by Directive (EU) 2015/2193 of the European Parliament and of the Council of 25 November 2015 on the limitation of emissions of certain pollutants into the air from medium combustion plants will only be supported if they guarantee 80% compliance of the emission limit value for emissions of solid pollutants defined by Decree No. 415/2012 Coll. on the permissible level of pollution and its determination and on the implementation

of certain other provisions of the Air Protection Act, for sources put into operation on 20 December 2018 or later.

- projects on stationary combustion sources covered by Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) will only be supported if they guarantee lower (the most ambitious) half of the range of values according to the Conclusions on Best Available Techniques (BAT) for solid pollutants,
- there is no increase in NO_x emissions per unit of fuel energy compared to the original state,
- projects cannot be supported in cadastral territories where, according to the maps of five-year moving averages compiled by the Czech Hydrometeorological Institute (in accordance with paragraphs 5 and 6, §11 of the Air Protection Act), one of the air pollution limits set out in point 1 of the Annex 1 of the Act has been exceeded for PM₁₀ or PM_{2.5}.

Notes:

1) Price levels are taken from an independent study "Market analysis in the industrial sector" (Enviros, November 2020; see Annex G), may be updated with regard to the year-on-year development of prices of construction work, supplies and services in the Czech Republic.

2) The situation before the project realization, in the case of energy consumption, is primarily defined by the average energy consumption for the last three closed billing years before submitting an application for support (processing Energy Assessment) as inputs to the energy balance of the production or processing node.

3) Energy storage measures can only be supported as part of a comprehensive project addressing energy source modernization as well and are assessed as an integral part of the project, i.e. the project as a whole must meet a set of relevant eligibility criteria.

Mandatory indicators setting minimum requirements for project contributions **as well as** so-called **monitored indicators will be observed** and evaluated within the implemented projects.

Mandatory indicators will be part of the grant application and will be subject to a contractual obligation; they will help to monitor and measure the achievement of specified outputs of the project itself. Fulfilment of mandatory indicators is under the direct control of the project and must be achieved in a specified time frame set down in advance. If the project target values of relevant mandatory indicators would not be fulfilled, a correction of up to 100% (depending on the degree of non-fulfilment) would be applied. *Monitored indicators* are not obligatory, but present a contribution for monitoring of project outputs from the point of view of its benefits to national strategic goals.

Below both mandatory and monitored indicators applicable for a summary of all supported types of technologies are enumerated.

The mandatory indicators include:

- reduction of final energy consumption in connection with the implementation of the project in GJ per year,
- reduction of primary energy consumption in connection with the implementation of the project in GJ per year,
- reduction of CO₂ emissions in connection with the implementation of the project in tonnes of carbon dioxide per year,
- thermal output of a newly built RES in MW_t per year,
- electrical output of a newly built RES in MW_e per year.

The monitored indicators include:

- reduction of particulate matter (PM) emissions from stationary sources,
- reduction of emissions of suspended PM₁₀ particles from stationary sources,
- reduction of emissions of suspended PM_{2.5} particles from stationary sources,
- reduction of sulphur dioxide (SO₂) emissions from stationary sources,
- reduction of nitrogen oxide (NO_x) emissions from stationary sources,
- reduction of volatile organic compounds (VOC) emissions from stationary sources,
- reduction of ammonia (NH₃) emissions from stationary sources.

The project proponents are further required to:

- submit project documentation for a construction permit, emission assessment, and energy audit together with grant application;
- complete project no later than 5 years from the moment of issuing the Decision of the Minister of the Environment on the provision of funds from the State Environmental Fund of the Czech Republic;
- keep the supported installation without any major changes for at least 10 years after project completion.

These conditions ensure that projects are in advanced stage of preparation and that the projects have specified time frame during which they must materialize.

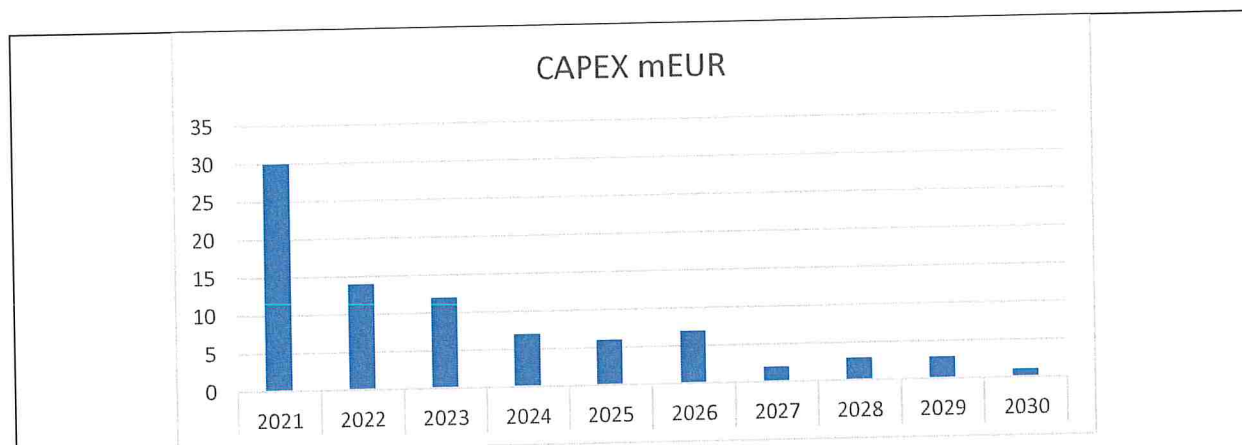
The preliminary conditions were made available to the project proponents for sake of project intentions registration. The analysis of submitted project intentions (according to our preliminary call for project intentions) shows that applicants put forward technologies that are mature and ready for implementation. As the study shows (see Annex A), these technologies are common in the Czech Republic, as well as in other EU member states, and are successfully used, including their combinations. Consequently, investment support of these technologies is a guarantee that the planned savings will be achieved.

4.6. Please indicate direct employment created by the proposed investment (separately for the implementation period, in person x years, and operation period, in number of permanent jobs created).

According to the estimate of the report submitted by ICF S.A. in association with Enviros "Supporting low-carbon transition of the Czech Republic by EU ETS Funding Mechanisms – Deliverable 4 Final; Quantitative analysis of potential impacts from Modernisation Fund deployment" (funded by the EU via the Structural Reform Support Programme and implemented in collaboration with the Czech Ministry of Environment and the European Commission; see Annex B), the reduction of energy consumption in the ENER ETS programme of the Modernization Fund implementation plan of the Czech Republic should have the direct, indirect and induced employment effect of 5,428 (FTE person-years, without public/private sector leverage), should help to create up to 25 additional jobs, which is 0.07 jobs per unit energy saved/generated (GWh) by 2030.

4.7. Please provide the investment implementation schedule.

According to the proposals of financing in years contained in projects' intentions submitted in the preliminary call for project intentions, the following investment implementation schedule for projects under this scheme can be anticipated:



On the basis of the investment implementation trend presented in the chart, the scheme implementation schedule for the year 2021 was conceived as follows:

- 1) Launching the 1st call for project proposals: 06/2021
- 2) Start of receiving applications for support: 07/2021
- 3) Submission deadline of applications (under the first call): 01/2022

The call is continuous. When the initial disbursement will be depleted, subsequent applications will be submitted to EIB to replenish the funds.

5. Justification for the Modernisation Fund (Articles 6(7)(a), 6(7)(b) and Annex I, point 1.3 of the IR)

5.1. Please provide detailed justification for the Modernisation Fund support, including the confirmation of the compliance of an investment with Article 10d(1) of Directive 2003/87/EC.

The present scheme's proposed investments into measures improving energy efficiency complies with Article 10d(1) of Directive 2003/87/EC. Energy efficiency increase is demonstrated by reduction of primary energy consumption.

No measures aiming at improvement of energy efficiency in energy production facilities using solid fossil fuels would be supported.

Given that this scheme will provide support to change of fuel base in the Czech EU ETS industry, which will lead to significant reduction of GHG emissions, gradual coal phase-out, better energy efficiency, as well as Just Transition in coal regions, we are positive that this scheme is fully in line with the aims of the 2003/87/EC Directive, the objectives of the European Union's 2030 climate and energy policy framework, with the objectives of the National Energy and Climate Plan of the Czech Republic as well as the long-term objectives as expressed in the Paris Agreement.

It fully complies with Article 10d(1) in the following aspects: it shall not provide any subsidies to new energy generation facilities that use solid fossil fuels, it will modernise energy systems, including renewable energy and energy efficiency. It also includes the financing of small-scale investment projects (there is no lower threshold for the eligible investments). The scheme will contribute to coal phase-out and decommissioning of coal-fired boilers in CHP plants.

*"The evaluation of the potential of high-efficiency cogeneration and efficient district heating and cooling for the Czech Republic" prepared by the Ministry of Industry and Trade in 2015 defines the expected progress in CHP development in 2015–2025 and it results in the following conclusions: The potential for the development of high-efficiency CHP has been identified. Growth of sources with high efficiency cogeneration can also be expected in the area of **biomass** utilisation, biogas stations (including heat transfer from existing sources) ... **However, the development of these high-efficiency CHP areas is conditional on maintaining stable economic incentives** for investors and resource providers.*

– This target is in accordance with the scheme's investments in high-efficiency cogeneration using biomass and biogas.

Implementation programme document stipulates that **projects with measures on sources for which the combustion of coal or any other fuel with a higher CO₂ emission factor would not be terminated after implementation will not be supported.**

5.2. Please provide detailed justification why the investment shall be considered as a priority investment under article 10d(2) of the ETS Directive.

The types of measures proposed for support from the scheme fall into the fields of support mentioned in the article 10d(2) of the ETS Directive.

« At least 70 % of the financial resources from the Modernisation Fund shall be used to support investments in the generation and use of electricity from renewable sources, the improvement of energy efficiency, except energy efficiency relating to energy generation using solid fossil fuels, energy storage and the modernisation of energy networks». Supported measures in the scheme include projects with high-efficient CHP installations using renewable sources only.

Renewable sources of electricity and energy storage are explicitly mentioned in the Art. 10d(2) as well as in the Assessment Guidance Document, Appendix 1, as a priority investment example. Given that no other activities than renewable sources of electricity/heat and energy storage technology will be supported under this scheme, we are positive that this scheme represents priority investment.

6. Costs (Annex I, point 1.4 of the IR)

6.1. Please provide total investment cost breakdown for individual investment projects. The following is an example of a breakdown of investment categories:

- Planning/design fees
- Land purchase
- Building and construction
- Plant and machinery or equipment
- Publicity
- Supervision

In the case of schemes, please provide total investment cost breakdown by components/measures covered by the scheme as described in section 4.5.¹⁴

Where it is required by the nature of the project, please provide units costs /cost benchmarks (i.e. in case of supply contracts, Just Transition measures, etc.) and/or costs of major components / modules.

The main investment categories are represented by the following shares, as is documented in the study by Knápek et al.¹⁵:

Type of modernization	Reconstruction of the source		Replacement of the source	
	up to 50 MWt	50-300 MWt	up to 50 MWt	50-300 MWt
Plant and machinery or equipment	85 %	90 %	70 %	75 %
Building and construction	15 %	10 %	30 %	25 %

The detailed breakdown of CAPEX per technology is presented in the following section (please see 6.2).

Other investment categories are:

- *Planning/design fees* are eligible only in case of Design & Build (& Operate) mode, and correspond to ca 0.6%.
- *Land purchase* is qualified as not eligible.
- *Publicity is eligible*, as defined in the [Design manual for projects funded from the Modernisation Fund](#).
- *Supervision* is eligible up to ca 3.0% of direct realization costs of the project.

Budget items in more detail:

Reconstruction of a coal steam boiler to biomass fired grate steam boiler with back pressure turbine

1. Fuel management ca 15%

new or a modification of coal management due to biomass parameters, such as fluctuations in properties, energy density 3 times lower than for coal, specific storage conditions; it must be completely changed:

a. *Fuel intake (car transport vs. train transport, typical of lignite)*

b. *Fuel storage (lignite can be stored in a high pile, wood chips are limited to approx. 6 m)*

c. *Fuel handling (for lignite, a dozer is enough for loading and compaction, together with standard belt conveyors; for biomass: 3 times larger spatial volume is handled; 1 ton of coal represents from 1.6 to 1.8 ton of biomass; the phenomenon of spontaneous combustion and clumping)*

¹⁴ e.g. if a scheme comprises renewable electricity generation plants from solar, wind and hydro etc. then provide the cost separately for all type of plants.

¹⁵ Knápek, J., Valentová, M., Krejcar, R., Vašíček, J., Vecka, J. 2021. Klimaticko-energetické investice v teplárenství 2014–2030. ČVUT v Praze, to be downloaded here: <https://ekonom.feld.cvut.cz/cs/katedra/lide/valenmi7/cic2030/reports/ipp-teplarenstvi-report-final.pdf>.

<i>d. Metal and oversize separator (crusher recommended)</i>	
2. Boiler including accessories:	30-35%
<i>a. Boiler pressure system depending on the design and parameters (usually drum, evaporator, water heater, steam superheater)</i>	
<i>b. Fuel tank in front of the boiler, including protection against blazing (monitoring, fire-fighting equipment)</i>	
<i>c. Supporting structure of the boiler, auxiliary structures (galleries and service platforms, stairs, floor grilles)</i>	
<i>d. DENOx – reduction of nitrogen oxide emissions, reagent injection system into the combustion chamber + reagent tank (urea) (if emissions of around 180 mg / Nm³ are required)</i>	
<i>e. Fittings (fine equipment), Sets (Coarse equipment), blowdown expander, chemical dosing, condensate tank including water and condensate pumps</i>	
<i>f. Silencers (start-up, safety valve, air intake silencer)</i>	
<i>g. Boiler grate (water or air cooled according to the considered fuel, in the case of a fluidized bed boiler)</i>	
<i>h. Steam air heater</i>	
<i>i. Air ducts including air fan (air supply under the grate sometimes by an independent fan; more massive fan in a fluidized bed boiler), flue ducts with flue gas fan including flue gas recirculation (with flue gas dilution fan according to boiler design reagent; it does not have to be used, but the demands on the DENOX system increase, including the operating consumption of the reagent)</i>	
<i>j. Insulation, linings</i>	
<i>k. Removal of residual products (slag / bottom ash) – extractors, storage vessel (silo or container)</i>	
<i>l. Cloth filter (flue gas dedusting) including ash removal, its storage (transporter / pneumatic transport + silo)</i>	
3. Steam turbine including oil management and with condenser (for condensing turbine) and exchanger (water heating for sampling or back pressure) – and its removal if the original technology was like CHP	up to 30%
4. Connecting pipes modification of the connecting part in particular, new pipes in case of total change of spatial arrangement	up to 2%

5. Feed pump <i>in case of change of feed water parameters and degasification system if there is none yet</i>	up to 4%
6. Feedwater treatment <i>Chemical water treatment plant for water clarification and preparation of demineralised water / reverse osmosis</i>	up to 4%
7. Electrical part – high current <i>cabling for drives, lighting of technology and space around the device, it is not part of the boiler room lighting as such</i>	up to 4%
8. Measurement and regulation <i>low current, sensors, gauges, actuators, emission measurement and control system (visualization, communication, data storage), source of instrumental and drive air</i>	up to 10%
9. Chimney <i>construction of a new one / modification of the existing one – reduction of the cross-section if necessary and lining</i>	up to 4%
10. Construction work for all foundations for technologies under construction	up to 20%

The projects will be subject to compliance with the legislation on public procurement and program's Guidelines of the Fund for public procurement.

Investment costs by investment categories will be monitored in particular through mandatory financial indicators of submitted projects.

6.2. With respect to the cost breakdown provided in section 9.1 above, please identify the cost components/categories/types which will be funded by the Modernisation Fund (Amount and/or percentage for each component/category/type) and/or the cost eligibility criteria to be applied to MF funding.

Suitable technologies for the transition of sources to low-carbon industrial energy

(25.5 CZK/EUR exchange rate is used)

Below is a complete list of technological variants that can be considered according to the rules of the scheme. The technical parameters are set as standard for the conditions of the Czech industry. Investment costs were determined on the basis of market research, consultations with technology suppliers, specific implementations in recent years in the Czech Republic and a study of submitted projects in the currently open call of the SEF.

For all technological variants (unless stated otherwise in the text), installation into the existing boiler room building is considered, incl. external fuel management and modification of fuel storage area (in case of biomass), in relevant cases according to BAT conditions also flue gas cleaning with fabric filter and reduction of nitrogen oxide emissions (flue gas denitrification) – DENO_x (SNCR method – selective non-catalytic reduction).

1) Transition to biomass (CHP)

1.1 Block/unit consisting of:

- biomass fired grate steam boiler

Main parameters	Power output	40 MWt (50 t/h)
	Steam output pressure	3.8 MPa
	Steam output temperature	320°C
	Boiler efficiency	86.5 %

Price of the boiler (without turbine): 15.7 mil. EUR

1.1.1 Variant

- biomass fired grate steam boiler with back pressure steam turbine and basic heat exchanger for heat supply systems (usually 90/60°C)

Turbine parameters	Power output	9 MWe
	Steam output pressure	0.2 MPa (hot water heating)
	Electric efficiency	23 %
	CHP efficiency	85 % (total full CHP regime)

Price of the turbine: 6.3 mil. EUR

Total CAPEX: 22 mil. EUR

1.1.2 Variant

- biomass fired grate steam boiler with condensing steam turbine with steam extraction

Main parameters	Power output	10.5 MWe
	Steam output pressure	0.015 MPa (condensation)
	Electric efficiency	29% (in full condensation regime)

Price of the turbine: 7.1 mil. EUR

Total CAPEX: 22.7 mil. EUR

1.2 Block/unit consisting of:

(it is an alternative to the previous technical solution and changes only the design of the boiler, which is more efficient, but also more expensive – increased efficiency of steam production on the boiler then leads to increased overall efficiency – the same production behind the boiler and turbine)

- biomass fired fluidized bed steam boiler

Main parameters	Power output	40 MWt (50 t/h)
	Steam output pressure	3.8 MPa
	Steam output temperature	320°C
	Boiler efficiency	90%

Price of the boiler: 17.6 mil. EUR

1.2.1 Variant

- biomass fired fluidized bed steam boiler with back-pressure steam turbine together with basic heat exchanger for heat supply system (usually 90/60°C)

Turbine parameters	Power output	9 MWe
	Steam output pressure	0.2 MPa (hot water heating)
	Electric efficiency	23%
	CHP efficiency	85% (total full CHP regime)

Price of the turbine: 6.3 mil. EUR

Total CAPEX: 23.9 mil. EUR

1.2.2 Variant

- biomass fired fluidized bed steam boiler with condensing steam turbine with steam extraction for heat supply system

Main parameters	Power output	40 MWt (50 t/h)
	Steam output pressure	0.015 MPa (condensation)
	Electric efficiency	29% (in full condensation regime)

Price of the turbine: 7.1 mil. EUR

Total CAPEX: 24.7 mil. EUR

2) Transition to biogas or bio-methane

2.1 Variant

- bio-methane piston engine with generator
- engine cooling system composed of a system of exchangers transferring the removed heat to the heating water of the heat supply system

Main parameters	Electric power output	31 MWe
	Thermal power output	30 MWt
	Total efficiency	94%

Total CAPEX: 25.5 mil. EUR (except. construction on a greenfield site)

2.2 Variant

- biogas piston engine with generator
- engine cooling system composed of a system of exchangers transferring the removed heat to the heating water of the heat supply system

Main parameters	Electric power output	5 MWe
	Thermal power output	5.2 MWt
	Total efficiency	86%

Total CAPEX: 4.7 mil. EUR

General conditions for eligibility of expenditures are the following:

Support may only be granted for eligible expenditure that meets all of the following conditions:

- is in accordance with the legal regulations of the Czech Republic and the EU,
- is in accordance with the program, the relevant call and the issued methodological guidelines,
- is spent in accordance with the 3E Rule (economy, efficiency, effectiveness),
- complies with the terms of the GBER,
- is appropriate, i.e. corresponds to the usual prices at the place and time,
- is duly identifiable, provable and verifiable,
- is directly and exclusively connected with the implementation of the project, is created at the time of its implementation, and is part of its budget,
- is eligible if the cost was incurred after the application was submitted.

The basic eligible costs related to the investment include in particular:

- Direct realization costs: expenditures on construction works, supplies and services directly related to the project, including the investments made. In the case of the Design & Build (& Operate) mode, it is possible to include, for example, expenditures on related project documentation into direct realization expenditures.
- Activities of professional technical or author's supervision, as well as ensuring occupational health and safety – eligible maximum 3.0% of direct realization costs of the project
- Publicity measures: expenditure on publicity measures that were incurred in direct connection with the project and in connection with the requirements for ensuring publicity are eligible; publicity requirements will be set out in the call and in the [Design manual for projects funded from the Modernisation Fund](#).
- VAT: Value added tax can be considered eligible only for recipients who cannot claim a deduction of input value added tax in the sense of relevant national legislation (Act No. 235/2004 Coll. concerning value added tax, as subsequently amended). If the right to a VAT refund arises subsequently, the beneficiary is obliged to return the relevant aid, regardless of whether or not he asserts the right before the financial administration authorities.
Eligible VAT applies only to payments which are considered eligible. If the payment is eligible only partially, then the VAT relating to that payment is eligible from the same aliquot part.

Ineligible expenditures, i.e. expenditures for which support cannot be granted are the following:

- measures that do not correspond to the objectives of the program and the conditions of the relevant call,
- purchase of used equipment,
- expenditures for the processing of project documentation and project activities (with the exception of the Design & Build (& Operate) regime),
- expenditure on the purchase of real estate,

- fees for the withdrawal of land from the agricultural land fund or land intended for the performance of forest functions and for the establishment of easement,
- taxes – VAT (except as stated above), direct taxes, gift and inheritance tax, real estate tax, real estate transfer tax, road tax, customs duties,
- expenditure on providing relevant statements,
- induced investments that are not exclusively and directly linked to the purpose of the project,
- loan instalments, interests,
- extra-works above the amount of eligible less-works,
- administrative fees (e.g. notary fees, cadastre deposits, fees for issued building permits, fees for discharging wastewater into surface waters),
- budget reserve,
- payroll and other staff expenses, overheads and operating expenses.

As can be seen from other sections of this scheme application, GBER thresholds are always the limit for total investment costs to be covered.

Input data and methodology for calculating the capital intensity of CO₂ reductions and primary energy savings

1. Resource usage time - Load factor (LF)

The amendment to the POZE Act (Act on Supported Energy Sources) and the ERO (Energy Regulatory Office) price decision for 2022 stipulate a green bonus for existing cogeneration units (CU) up to 5 MW in the regime of 3000/4400 hours/year. To calculate the investment intensity, we choose LF 3000 hours/year as a case covering a wider range of applications.

2. Emission factor (EF)

The emission factor of biomass (B) for the input fuel is 0 kg/MWh, for lignite and other fuels see the table below. It should be emphasized that these are emission factor values that relate to the energy supplied in the fuel (power input), not values related to energy production (power). For this reason, the values given in Tab. 1 do not include energy conversion efficiency, i.e. combustion efficiency is not included.

Tab.1: CO₂ emission factors for energy supplied in fuel in the Czech Republic

Fuel/energy	Emission factor (t CO₂/MWh)
Hard coal	0.330
Lignite	0.352
Coke	0.385
Lignite briquettes	0.346
Fuel and other gas oil	0.267
Low sulphur fuel oil (sulphur up to 1 % w/w)	0.279
High sulphur fuel oil (sulphur above 1 % w/w)	0.279
Natural gas	0.2
Liquefied petrol gas (LPG)	0.237
Electricity	0,86

*Source: Decree No. 140/2021 Coll. on energy audit, as amended.
Ministry of Industry and Trade. Prague 2021.*

3. Energy efficiency (E)

The energy efficiency values given below in the examples demonstrating the adopted methodology are taken from energy practice (for new technologies it can be documented by supplier offers). These values can be further updated, for example by confronting BAT with the offers of reputable suppliers.

4. CAPEX

The values of typical investment costs in the conditions of the Czech Republic are given by the compilation of the following sources:

- Specific applications of subjects interested in subsidies from the Modernization Fund
- Recently realized investments and current tenders
- Recommendations of major suppliers (Siemens)

For the purpose of standardization, it is appropriate to choose the power of the source (e.g. 50 MWt). Therefore, if the practical data relate to another performance, it is necessary to convert CAPEX to a standardized value.

5. Calculation methodology

We have to compare technologies and savings on the basis of the same output, for heating technologies it is the same output value of thermal energy (MWh or GJ). We will explain the methodology on several specific examples from practice.

Example 1: Conversion of an old heating lignite-fired boiler to a new biomass fired boiler with highly efficient cogeneration.

We will choose the net heat output P_t of the old Lignite-fired boiler and the new cogeneration biomass boiler (or the heat output of motor cogeneration or SGC – steam-gas cycle). In the case of cogeneration, the P_e of electrical power is added to it. Depending on the type of gas cogeneration (back pressure, condensation sampling, engines, SGC), this electrical output differs.

Emission intensity of new investment tCO_2/year :

$$\frac{P_t + P_e}{E_{\text{total}}(B)} \times EF(B) \times LF \quad (1)$$

This must be compared with the initial state, where the heat is generated by the old heating Lignite-fired boiler and for the equivalent production of electricity it is necessary to accept the assumption of separate condensing production from Lignite:

Emission intensity of the initial state tCO_2/year :

$$\left(\frac{P_t}{E_t(L)} + \frac{P_e}{E_e(L)} \right) \times EF(L) \times LF \quad (2)$$

Resulting tCO_2 savings/year:

Emission intensity of the initial state - emission intensity of the new investment

$$\left(\left(\frac{P_t}{E_t(L)} + \frac{P_e}{E_e(L)} \right) \times EF(L) - \frac{P_t + P_e}{E_{\text{total}}(B)} \times EF(B) \right) \times LF \quad (3)$$

After insertion of correct values from energy practice (can be evidenced by supplier offers): $((40/0.85 + 9/0.35) \times 0.352 - (49/0.87 \times 0.0)) \times 3,000 = 112,711 \text{ t CO}_2/\text{year}$, which represents a saving of 100% of the initial state. It satisfies the following condition without difficulty: *The implementation of the project must reduce, compared to the initial state, CO₂ emissions min. by 20%.*

We will also determine other parameters:

Resulting primary energy savings:

Baseline primary energy consumption - Primary energy consumption of the new investment

$$\left(\frac{P}{E(L)} - \frac{P}{E(B)} \right) \times LF \quad (4)$$

After inserting relevant values, we can see that the resulting value of 22.2% meets the condition of saving at least 10% of primary energy.

Capital intensity of conversion

The capital intensity of CO₂ and primary energy savings is then simply determined by the relationships:

$$\frac{CAPEX}{\left(\left(\frac{P_t}{E_t(L)} + \frac{P_e}{E_e(L)} \right) \times EF(L) - \frac{P_t + P_e}{E_{total}(B)} \times EF(B) \right) \times LF} \quad (5)$$

$$\frac{CAPEX}{\left(\frac{P}{E(L)} - \frac{P}{E(B)} \right) \times LF} \quad (6)$$

CAPEX values can best be obtained on the basis of verified offers from reputable suppliers that respect the price level and market situation in the country. CAPEX values always lie in a certain interval depending on the following parameters:

- Resource performance (in general, specific investment costs decrease with increasing output)
- Specific technological arrangement (steam production is more demanding than hot water production; steam output in tons/hour needs to be converted to thermal output in MW_t – the conversion factor depends on the parameters of the steam produced, i.e. temperature and pressure, in a case of a steam boiler, the coefficient of 1.3 would be used.
- Development of inflation (in 2021 supplier prices increased significantly due to rising prices of basic materials).

For the above-described example, we valued CAPEX of the technology (see Annex A, Annex 1 "Proposal of suitable technologies of the Czech Republic heat sector for the transition to low-carbon energy") at the level of 560 million CZK (= 21.96 mil. EUR). For the conversion from CZK to EUR, we will use the exchange rate of

25.5 CZK/EUR¹⁶, and after substituting into the above-mentioned relations, the capital intensity of CO₂ and primary energy savings result in (for calculations see Annex D):

Capital intensity of CO ₂ savings	195 EUR/tCO ₂ /year
Capital intensity of primary energy savings	310 EUR/MWh/year

→ Detailed calculations of contributions for each individual technology can be found in Annex D ←

The characteristics of emission reduction and energy savings parameters in the case of biomass combustion are the following:

- The emission factor in the case of biomass is 0. This implies that the criterion of minimum CO₂ savings is always met, the savings are automatically 100%. However, it should be noted that massive deployment of biomass may have other undesirable environmental consequences. Specifically, emissions other than CO₂, especially dust emissions, are practically the same as coal combustion, and the parameters are, on the contrary, significantly worse than for gas combustion. Support of conversion to biomass should therefore not be directed to areas where the population suffers from a high air pollution load (in the case of the Czech Republic, for example, the Ostrava region).
- On the contrary, the criterion of minimum primary energy savings is more difficult to achieve for biomass. Biomass is a more problematic fuel for the combustion process than coal and worse than natural gas. It also follows that the capital intensity of primary energy savings is high for biomass.
- A biomass steam boiler typically has lower energy efficiency compared to a natural gas boiler, but as a renewable source of energy, for biomass technologies the criterion of minimum non-renewable primary energy savings is comfortably achieved.

The results documented for our selected example from practice confirm the above statements.

The data will be reported based on the outputs (see Mandatory and Monitored indicators, section 4.5) of projects submitted within the grant scheme, and in accordance with the specified Regulations. The relevant value will be based on the types of measures and projects (see the basic supported project types, section 4.5) in accordance with min. eligibility criteria on energy efficiency and CO₂ emissions reduction (see Outcomes – minimum requirements for investments in view of meeting medium and long-term national goals, section 4.5).

Emission factors used in the calculations above are in accordance with the GHG Inventory Reporting of the Czech Republic.

The cost-effectiveness values are in detail included in Annex D.

We are demonstrating an improvement in energy efficiency by reducing primary energy consumption. The specific contributions calculated (according to the CTU study, Annex A) for investments within the support from the Modernization Fund are shown in Annex D.

6.3. Explain how you have estimated the investment cost.

¹⁶ According to the reference exchange rates of the European Commission: <https://eur-lex.europa.eu/legal-content/CS/TXT/PDF/?uri=CELEX:C2021/052/02&from=CS>

- Please provide the year of the preparation of the investment cost.
- Please indicate whether the costs are based on basic/detailed design, or pre/post tendering estimates, or contractual estimate. The most recent cost information should be used.
- If costs are based on finalised public procurement procedures, please provide a list of; finalised procedures, resulting contracts - their scope and price.
- Please provide justification of all investment costs - benchmark construction cost against similar projects (adjusted for differences in cost levels and year of cost estimate). Benchmark design and supervision cost items (as a percentage of overall costs) against 'normally' expected levels for the type of project.
- In case of soft investments targeting Just Transition in carbon-dependent regions: salaries benchmarked against market rates/salary bands.

The preparation of the scheme budget started during the year 2020, when ICF analysed the investment gaps and potential. Based on these recommendations, the Czech Government approved the General Programme Document in January 2021, which states that 13.3 % of the overall Modernisation Fund revenues available for the Czech Republic shall be used for the ENERGETS programme.

For the year 2021, only 3 programmes (dealing with: 1) modernization of heat supply systems – Programme HEAT, 2) new renewable sources of energy – Programme RES+, and 3) **improving energy efficiency and reducing the emissions of greenhouse gases in industry in EU ETS – Programme ENERGETS**) were chosen as having the highest impact out of 9 programmes on energy efficiency and GHG emissions reduction. Therefore the Committee for the Modernisation Fund decided to make use of the 2021 revenues as is indicated in the following table:

Estimated financial sources	
Number of auctions from 1.1.2021 to 17.9.2021	92
EUAs per auction (equal for each)	512,223
EUAs auctioned from 1.1.2021 to 17.9.2021 (total)	47,124,500
EUAs auctioned from 1.1.2021 to 17.9.2021 (CZ MF)	14,150,744
2021 average EUA price EUR/EUA (from 1.1.2021 to 27.7.2021)	46.51
Value of CZ MF share auctioned from 1.1.2021 to 17.9.2021 (EUR)	550,000,000
<i>Source: EEX, EUA Primary Market Auction Report 2021 (cited 12.4.2021): https://www.eex.com/en/market-data/environmental-markets/eua-primary-auction-spot-download</i>	
Required for the first disbursement (non-priority projects only)	93,000,000
Amount in EUR earmarked for HEAT scheme in 2021:	60,000,000
Amount in EUR earmarked for ENERGETS scheme in 2021:	33,000,000
Required for the 1st + 2nd disbursement (priority projects only)	320,000,000
Amount in EUR earmarked for priority HEAT scheme in 2021:	30,000,000
Amount in EUR approved for programme RES+ in 2021:	202,000,000
October investment increase in EUR for programme RES+ in 2021:	58,000,000
Amount in EUR earmarked for priority ENERGETS scheme in 2021:	30,000,000

In the preliminary call for project intentions, a total of 9 project intentions were accepted for this non-priority ENERG ETS scheme. Data from the preliminary call for project intentions were analysed, ineligible projects were excluded and eligible expenditure assessed and used to determine the size of the scheme.

The scheme budget was determined on the basis of cost data according to the CTU study (see Annex A), and on estimation of project proponents' interest from the preliminary call for project intentions (please refer to Annex D for detailed calculations).

All projects comply with minimum requirements for investments (for more details see section 4.5).

No soft investments targeting Just Transition in carbon-dependent regions are projected in this scheme.

7. Financing Details (Articles 4(5) and Article 6(7)(e) and Annex I, points 1.5, 1.6, 1.7 of the IR)		
7.1. Is the present investment supported with other EU/National funds/support mechanisms?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
7.2. If Yes, please provide detail (which funds, measures, support value, type of costs covered and other relevant information) <i>Please note, that provided information about contributions from other Union and national instruments shall allow to assess whether the amounts requested from the Modernisation Fund are not intended to cover the same costs of the investment as those financed by another Union or national instrument (double funding of the same costs is not allowed)-(art. 6.7.e of the Implementing Regulation).</i>		
—		
7.3. Please specify the total requested amount of the financing for the investment proposal from the Modernisation Fund (in EUR), a maximum co-financing rate and a form of financing (grant, loan, etc.).		
<i>The requested amount for this scheme is 85,000,000 EUR in total and 30,000,000 EUR for the first disbursement under this application. There will be no co-financing from other Union or national instruments, Modernisation fund co-financing rate is between 45 and 65 % of eligible costs in line with GBER.</i> The maximum amount of support in the projects of this scheme (i.e. the threshold for individual notification) is EUR 15 million. The support to the final beneficiaries will be provided in the form of grants.		

7.4. Please provide the annual financing plan showing the total planned financing resources and the planned support from the Modernisation Fund and other sources of financing for the investment.

The support will be provided after the decision of the Minister of the Environment and the grant agreement concluded with the SEF in the form of continuously paid ex post subsidies, i.e. on the basis of documented eligible expenses (payment requests will always be backed up by copies of invoicing and bank statements, or other documents) and documents proving meeting of the conditions set out in the Programme Implementation Document together with the relevant call.

The SEF will not provide pre-financing, soft loans, guarantees nor financial instruments.

The annual financing plan is presented in section 4.7, the total planned financing resources and the planned support from the Modernisation Fund are presented in sections 7.3, 3.5 and 3.5.

Subjects in industry sector obtaining support from the Modernisation Fund are bound by the conditions of its relevant calls to secure the costs remaining after receiving the aid from the Modernisation Fund.

8. State Aid (Article 6(7)(c) and Annex I, point 1.8 of the IR)

8.1. Does the investment involve granting State aid? (in the meaning of Article 107(1) of the Treaty on the Functioning of the European Union)

Yes ☒

No ☐

8.2. If Yes, please provide evidence as applicable:

- a) the Commission decision of non-objection on the national aid measure;
- b) reference under which the block-exempted measure has been registered (State aid number attributed by the Commission's electronic notification system referred to in Article 11 of Regulation (EU) No 651/2014) (GBER) or in case of new measure, the expected date of transmission of summary information on the measure as per. Article 11 of GBER.

Please specify total eligible costs as well as the aid intensities and any other relevant condition, based on the State aid decision /applicable GBER provisions.

Please confirm that the total amount requested from the Modernisation Fund and other Union and national instruments (total State aid) does not exceed the amount and percentage allowed by the State aid decision/GBER.

State aid intensities are in force at the time of submission of the scheme (10/2021), in case of relevant legislative rules update (GBER rules in particular) the scheme will be updated in accordance with all EU and national requirements.

The maximum amount of support in the projects of this scheme is thus EUR 15 million. **The scheme complies with the GBER and its Article nr. 38.** Only projects that meet the conditions of the GBER and do not exceed the limit for individual notification will be supported from the scheme.

This procedure was preliminarily consulted with the Czech Office for the Protection of Competition (ÚOHS) and at the same time we submitted the relevant documents to this Office for inspection. No fundamental observations were made so far; however, cooperation with the Office will continue.

The reference registration number (pre-notification number) under which the block-exempted measure has been registered in the Commission's electronic notification system is the following: **SA.64396**.

The maximum aid intensity according to GBER is defined below. The relevant article of the General Block Exemption Regulation (GBER) is Article 38 – Investment support for energy efficiency measures.

Applications submitted under announced calls that do not reach the GBER thresholds will be evaluated and approved on an ongoing basis after the submission of the application for support or within the deadline set in the text of the call.

Applications submitted under the announced calls that exceed the GBER thresholds will be submitted individually for assessment by the European Investment Bank; a decision issued by the European Commission will be provided. Individually submitted applications must have a decision of the European Commission on state aid issued before they can be submitted for assessment.

Support to final beneficiaries

Given the nature of the projects, the aid will be granted under a public aid scheme under Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in accordance with Articles 107 and 108 of the Treaty (hereinafter only "GBER"). The aid will be disbursed as a percentage of eligible expenditure, which may not exceed the GBER aid intensities set out below.

Relevant article of the General Block Exemption Regulation (GBER) is the following:

Article 38 – Investment support for energy efficiency measures

<i>Enterprise / support (%)</i>	Prague	Other regions
<i>Large</i>	30	45
<i>Medium</i>	40	55
<i>Small</i>	50	65


The above aid intensities are effective for the duration of the existing state aid rules.

All the above mentioned aid amounts must take into account counterfactual investment when determining the eligible expenditure (scenario without aid is indicated). The applicant quantifies the cost of the counterfactual investment/scenario that could be implemented without the aid and is considered less environmentally friendly. These costs are deducted from the costs of project implementation and the resulting amount is the eligible costs for the calculation of the maximum public support. The percentage of aid intensity according to the relevant GBER, size and location of the enterprise will then be applied to these costs.

The method of quantifying the counterfactual investment for various cases is described in Annex C.

Alternatively, it would be possible to provide support under Commission Regulation (EU) No. 1407/2013 of 18 December 2013 on the application of Articles 107 and 108 of the Treaty on the Functioning of the European Union to <i>de minimis</i> aid.
8.3. If No, please attach a statement evidencing that support for the investment proposal does not constitute State aid within the meaning of Article 107(1) of the Treaty. The statement should be signed either by the national authority responsible for the implementation of the Modernisation Fund or by the national competent authority responsible for State aid and should include either a reference to a Commission decision or <u>detailed</u> reasoning why the support does not constitute State aid.
—

9. Declaration of compliance (Article 6(7)(d) and Annex I, point 1.9 of the IR)
9.1. Please attach a declaration of investment compliance with the applicable requirements of Union and national laws. The declaration should be signed by the national authority responsible for the Modernisation Fund.
Statutory declaration – Declaration of compliance (Please see Annex F)

10. Endorsement of Authority Submitting the Investment Proposal	
Name:	Jan Kříž, Deputy Minister, Ministry of the Environment of the Czech Republic
Signature:	
Date:	14/09/2021

Annex 1. Information required under Annex I point 2 of the IR

Additional information relating to Schemes:

1. Scheme managing authority (Annex I, point 2.1 of the IR)	
1.1. Name of the scheme managing authority	State Environmental Fund
1.2. Address	Olbrachtova 2006/9, 140 00 Praha 4, Czech Republic
1.3. Website	https://www.sfzp.cz/en/
1.4. Main contact:	
Name	Ivo Marcin
Position in the Organisation	Director of the Department of the State Fund Strategy and International Cooperation
Email	ivo.marcin@sfzp.cz
Telephone Number	+420 267 994 148
Mobile Number (optional)	+420 736 756 015

2. Information about the scheme (Article 4(2) and Annex I, points 2.2-2.3 of the IR)

2.1. Please provide a general description of the entities in charge of initiating or initiating and implementing projects under the scheme. Please specify development stage of the scheme.

The final beneficiaries targeted by the scheme are the EU ETS installations in the Czech Republic. Based on the analysis of submitted projects intentions, mostly measures on installations in the steel industry, chemical industry, and production of building materials are expected. *An updated list of facilities in the EU ETS is published on the [website](#) of the Ministry of the Environment.* The development stage of the scheme is "in implementation" – calls were launched.

2.2. Please indicate whether the proposal concerns:

- an existing scheme¹⁷ ☐
- a new scheme ☒

2.3. Please specify total volume of the scheme.

The total volume of the scheme is 85,000,000 EUR.

2.4. Please specify the amount requested as the first disbursement for the scheme.

The first requested disbursement amounts to 30,000,000 EUR.

2.5. Please provide location of the investment activity and provide the list of NUTS 2 locations concerned by the scheme.

Location of the investment activity is the whole Czech Republic, i.e.: CZ01 Praha, CZ02 Střední Čechy, CZ03 Jihozápad, CZ04 Severozápad, CZ05 Severovýchod, CZ06 Jihovýchod, CZ07 Střední Morava, CZ08 Moravskoslezsko. In these, the Just Transition regions are the following: CZ04 Severozápad and CZ08 Moravskoslezsko.

2.6.	Financial Start Date	2021	Financial Completion Date	2030
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¹⁷ In the meaning of recital 3 of the Implementing Regulation (2020/1001).

Annex 2. Information required under Annex I point 3 of the IR

Additional information relating to proposals other than Schemes:

1. Project proponent (Annex I, point 3.1 of the IR)	
1.1. Name of the project proponent	
1.2. Address	
1.3. Website	
1.4. Main contact:	
Name	
Position in the Organisation	
Email	
Telephone Number	
Mobile Number (optional)	

2. Information about the project (Annex I, points 3.2-3.5 of the IR)

2.1. Please specify location of the project. Please include geographic coordinates of the investment activity and provide the list of NUTS 2 locations concerned by the proposal.

2.2. Please specify total investment of the project.

2.3. Please indicate the development stage of the project.

2.4. Please list mandatory permits obtained or to be obtained.

2.5.	Financial Start Date		Financial Completion Date	
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MODERNISATION FUND
Accelerating the transition to climate neutrality

APPENDIX 4

**Investment proposal submission form
for priority investments**

MODERNISATION FUND
Accelerating the transition to climate neutrality

**Investment proposal submission
form for priority investments**

16/07/2021

Revision 1

MODERNISATION FUND – Accelerating the transition to climate neutrality

✉ modernisation-fund@eib.org

<https://modernisationfund.eu/>

Appendix 4 Investment proposal submission form for priority investments

for submission of the information on priority investments in accordance with
Article 10d(2) of ETS Directive¹

1. Submission information		
1.1. Targeted Investment Committee ²	S2/2021	
1.2. Priority order for assessment of priority investments ³	<p>By Submission Date - Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p> <p>If NO or for proposals submitted in batches: Please specify Priority Order</p> <p>P-1: Scheme (Part A – Priority): Modernization of energy sources of the Programme HEAT (CZ)</p> <p>P-2: Scheme (Part A1 – Priority): Modernization of energy sources of the Programme ENERGETICS (CZ)</p>	
1.3. Is the proposal a scheme? If yes, please fill in Annex 1 of this Form. If no, please fill in Annex 2 of this Form.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

¹ Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Union and amending Council Directive 96/61/EC with amendments (ETS Directive)

² Please provide the targeted Investment Committee date in form of semester Sx and year.

³ As per article 4.3 of the Implementing Regulation.

2. Authority responsible for the implementation of the Modernisation Fund

2.1. Name	State Environmental Fund of the Czech Republic
2.2. Address	Olbrachtova 2006/9, 140 00 Praha 4, Czech Republic
2.3. Website	https://www.sfzp.cz/en/
2.4. Main contact:	
Name	Ivo Marcin
Position in the Organisation	Director of the Department of the State Fund Strategy and International Cooperation
Email	ivo.marcin@sfzp.cz
Telephone Number	+420 267 994 148
Mobile Number (optional)	+420 736 756 015

3. General information		
3.1. Title of the investment	Scheme (Part A): Modernization of energy sources <i>priority investments of the Programme "HEAT"</i> <i>(Modernization of thermal energy supply systems)</i>	
3.2. Project proponent / Scheme managing authority (as indicated in Annex 1 or 2)	State Environmental Fund of the Czech Republic (hereinafter also "SEF")	
3.3. Beneficiary Member State	Czech Republic	
3.4. Priority area(s) based on Article 10d(2) of EU ETS Directive	<input checked="" type="checkbox"/> generation and use of electricity from renewable sources, <input checked="" type="checkbox"/> the improvement of energy efficiency (excluding energy efficiency in transport, buildings, agriculture and waste), <input checked="" type="checkbox"/> energy storage, <input type="checkbox"/> modernisation of energy networks, <input checked="" type="checkbox"/> just transition in carbon-dependent region, <input type="checkbox"/> energy efficiency in transport, <input type="checkbox"/> energy efficiency in buildings, <input type="checkbox"/> energy efficiency in agriculture, <input type="checkbox"/> energy efficiency in waste.	
3.5. Total investment costs (with and without VAT) (EUR)	Total investment costs: • 657,608,696 EUR with VAT and • 543,478,261 EUR without VAT	
3.6. Total support from the Modernisation Fund for a scheme (EUR)	Total volume of the scheme: • 250,000,000 EUR	
3.7. Requested amount for the first disbursement from the Modernisation Fund (EUR)	Requested amount for the first disbursement: • 30,000,000 EUR	
3.8. Please provide a NACE ⁴ code for the economic activity (More than one code may be relevant in some cases).	Code	Pro-rata share of overall investment (%)
	D.35 Electricity, gas, steam and air	100 %

⁴ Revision 2 classification system of economic activities established by Regulation (EC) No 1893/2006 of the European Parliament and of the Council

	conditioning supply	
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Please provide enough detail in this Form to enable the EIB to clearly understand what the project will do, how the project will be delivered, the impact it will have and how it will meet the requirements set out in the Directive 2003/87/EC and Implementing Regulation (EU) 2020/1001.

Please be as concise as possible. Please note any supplementary information you provide will not be reviewed⁵.

⁵ Except information explicitly requested by this Proposal Form, or additionally by the EIB during the investment appraisal process.

Summary information about the scheme	
Support Programme	Modernization of thermal energy supply systems (HEAT)
Support sub-area	Priority projects defined in the Programme HEAT
Supported activities	<p>Modernisation of energy sources and fuel base switch in thermal energy supply systems, with primary objective of decommissioning of coal-fired energy sources, in particular</p> <ul style="list-style-type: none"> reconstruction or replacement of the energy source with a change of the fuel used or type of energy to renewable energy sources in high-efficiency cogeneration of heat and power (hereinafter referred to as "high-efficient CHP").
Eligible beneficiaries	Owners of thermal energy supply systems in the Czech Republic
Type of support	Grant
Maximum amount of support	15,000,000 EUR
Basic outputs expected	<ul style="list-style-type: none"> <i>no. of projects supported:</i> 25 <i>total amount of support granted:</i> 250,000,000 EUR <i>total investments:</i> 543,478,261 EUR w/o VAT and 657,608,696 EUR incl. VAT <i>total CO₂ emission reduction:</i> 1,974 kt CO_{2eq} (4.5% of the National Energy and Climate Plan target) <i>total energy savings:</i> 5.2 PJ (4.3% of the National Energy and Climate Plan target) <i>no. of jobs created:</i> up to 20 in direct employment and 74 additional

List of annexes to the scheme:

Annex A – Modernisation of heat sources in the heating and industrial sectors in the Czech Republic

Annex B – Supporting low-carbon transition of the Czech Republic by EU ETS Funding Mechanisms

Annex C – Analysis of the project's compliance with the rules for the provision of public aid

Annex D – Excel calculations of costs and savings

Annex E – Analysis of project intentions submitted under the preliminary call

Annex F – Statutory declaration – Declaration of compliance

4. General description of the investment (Annex I, points 1.1, 1.2 and 1.10 of the IR⁶)

4.1. Please briefly describe what investment objectives are, including the impact it will have in the area and/or on project participants. Describe the short, medium and long-term results/impacts that the investment will deliver and how this will be measured.

Please link to SMART (specific, measurable, achievable and time-constrained) objectives. Please demonstrate how the investment will contribute to 2030 climate and energy framework objectives of the Member State and the long-term objectives as expressed in the Paris Agreement as required by the BMS National Energy and Climate Plans (NECP). Please also elaborate as to whether the proposal supports the national Just Transition Plan (JTP) and/or national RRP (Recovery and Resilience Plans).

Please include information on: (a) the expected energy saved in MWh (for a typical full year of the investment operation); (b) the greenhouse gas emissions to be saved in equivalent tCO₂ (for a typical full year of the investment operation); (c) the additional renewable energy capacity installed, if applicable.

Investment objective of the present scheme, consistent with the aims of the 2003/87/EC Directive, is the improvement of energy efficiency. In line with article 10d of the above-mentioned Directive, no measures aiming at energy efficiency relating to energy generation using solid fossil fuels would be supported. Increasing energy efficiency will lead to savings in primary energy consumption and, among other things, it will lead to increasing the number of renewable energy sources and a reduction in greenhouse gas emissions (specific values of these contributions please see below in this section).

The aim of the investment is to increase energy efficiency and/or reduce greenhouse gas emissions primarily through changing the fuel base and modernization (replacement or reconstruction) of energy sources intended for the supply of thermal energy (produced in cogeneration), including devices for the accumulation of thermal energy. Reduction of GHG emissions in the installations under the European Emissions Trading Scheme (EU ETS) is a key instrument of the EU climate policy as it covers around 40 % of the EU's GHG emissions. As stated in the NECP (National Energy and Climate Plan), the Czech Republic's goal is to reduce the total emissions of greenhouse gases by 30% by 2030 (compared with 2005), which corresponds to emission reductions of 44 Mt CO_{2eq} (for 2020, the goal was 32 Mt CO_{2eq}, i.e. 20% in comparison to 2005). Within the energy efficiency dimension for the period 2021-2030, the Czech Republic has three objectives:

- a) to reach primary energy sources at the level of 1,735 PJ,
- b) final consumption at the level of 990 PJ and
- c) energy intensity of GDP at the level of 0.157 MJ / CZK in 2030.

However, the projects will also contribute to other objectives in the field of air quality improvement as set out in the expected performance of the indicators (see below).

The short-term goal of this scheme is creating of a perspective for the operators of installations in heating sector that there is an instrument designed for support of investments in low-carbon technologies which is rather ambitious and strict regarding the projects eligibility. Thus, the investing environment will shift from renovation of coal-fired units towards heat generation technologies with lower carbon footprint. Partially, this

⁶ IR – Implementing Regulation (EU) 2020/1001

goal was achieved as the last coal-fired investment in the EU ETS sector took place around the year 2017. Now this scheme should send a clear signal that low carbon investments in the heat generation is the only option possible.

The medium-term goal is supporting of projects of fuel switch, renovation of district heating systems and accumulation technologies, which would bring significant reductions of GHG emissions and increased energy efficiency throughout the period 2021-2030, so that they contribute to achievement of abovementioned NECP targets. However, these targets are likely to be refined due to increased EU climate ambition and the „Fit for 55“ package. The projects will be accompanied with estimates of emission reductions by accredited energy auditors, and the drop in emissions is expected to be visible also from the EU ETS annual emission reports.

The long-term goal is to achieve complete coal phase-out in the heating sector. This scheme ensures that any project supported will be paired with decommissioning of any coal-fired units in the district heating systems by 2035. The declining number of coal-fired installations in the EU ETS should be visible in the annual reports according to Art. 21 of the Directive 2003/87/EC.

In line with the national and European strategic goals discussed above, the measures of **Modernisation of energy sources and fuel base switch in heat supply sector, with primary objectives of improvement of energy efficiency and decommissioning of coal-fired energy sources** (see more details in section 4.5) translate into the following contributions:

Potential scheme energy savings:	5.2 PJ (4.3% of the NECP target)
Potential scheme GHG emission reductions:	1,974 kt CO_{2eq} (4.5% of the NECP target)
Energy saved per deployed investments:	9.6 TJ/mEUR
Emissions abated per deployed investments:	3.7 ktCO₂/mEUR
Renewable electric energy capacity installed:	265 MW_e
Renewable thermal energy capacity installed:	945 MW_t
Number of jobs created:	up to 20 direct & 74 additional (details see 4.6)
(more detailed information on contributions within the scheme are presented in Annex D and also in sections 4.5 and 6.2)	

The proposed scheme is closely coordinated with preparations of the national Just Transition Plan (JTP), managed in the framework of the Operational programme Just Transition (financed from the Just Transition Fund) by the Ministry of the Environment of the Czech Republic in cooperation with SEF as an operator and projects administrator. The Czech JTP focuses on three coal regions (NUTS 3 Karlovarský, Moravskoslezský and Ústecký regions). Coal regions have **spacious areas affected by mining** (more than 70% of these areas are located in coal regions). The most affected is the Ústecký region with large surface lignite mines. The transition of an energy sector is/will be an integral part of regional plans and JTP. Both Modernisation fund and Just Transition Fund will provide financial support to this objective, and clear demarcation is set:

- **Modernisation fund** focuses on GHG reduction and modernisation of energy systems (as e.g. in this scheme);
- **Just Transition Fund** addresses the impacts of the transition – it will support companies creating green jobs or employees coming from the coal industry, and it will help to recover land needed for new investments into renewable sources.

In order to provide the coal regions with the needed support, there will be a reserved financial allocation of 30% for the coal regions under this scheme. According to our preliminary call for project intentions, 22% of submitted project proposals are coming from regions mentioned above.

The coordination with the **national RRP** is also on a high level. The body responsible for RRP is the Ministry of Industry and Trade. Its representatives are members of the committee and of all of the working groups related to Modernisation fund.

In the first years of its implementation, the RRP will finance the modernization of district heating pipelines, therefore this measure is not part of the measures covered by this scheme.

4.2. Please specify targeted beneficiaries⁷.

Modernisation fund Operator / Beneficiary

Modernisation fund operator / beneficiary is the State Environmental Fund of the Czech Republic (SEF). SEF is a special fund established by the law (Act no. 388/1991 Coll.). The primary purpose of the SEF is to support measures improving the quality of the environment. SEF will distribute grants from the scheme to final beneficiaries. SEF as the institution responsible for Modernisation fund implementation administrates final beneficiary's applications, disburses grants to the final beneficiaries, and audits supported projects.

Financial capacity

SEF's budget is independent of the state budget and has its own income from environmental fees (around 60 mil. EUR per year⁸). Revenues from own economic activity (mainly interests from loans) are insignificant. SEF is also beneficiary of technical assistance to cover incurred costs of administration OP Environment and New Green Saving programme (around 13 mil. EUR per year). The total volume of the administrated grants and loans was 572 mil. EUR in 2019. Modernisation fund resources are SEF's income according to the law (Act no. 383/2012 Coll. – national transposition of ETS directive). SEF's own resources will cover administrative costs of this scheme implementation.

Administrative capacity

SEF has more than 550 employees. There is a coordination unit of Modernisation and Innovation fund. Project administration is provided by the Section of Energy and Climate projects' implementation. Horizontal issues (i.e., legal services, financial control) are covered by the economic section and legal section for all programmes. The organizational scheme of SEF can be downloaded from the Internet⁹. The State Environmental Fund of the Czech Republic has a long-term experience in the administration of support for environmental measures. In the present time, the SEF administers several financial programmes, e.g. Operational programme Environment (financed by Cohesion Fund and European Regional Development Fund), National programme Environment (financed from the budget of SEF); New Green Savings programme (funded by the State budget from emission allowances revenues); and Norway grants. Besides these programmes, the Fund will also administer support from the Just Transition Fund.

The Ministry of the Environment of the Czech Republic chairs the Czech Modernisation fund Committee as an advisory body to Minister. The Committee consists of representatives of the Ministry of Industry and Trade, Ministry of the Environment, Ministry of Finance and the SEF. It has a leading role in the implementation of the Modernisation fund in the Czech Republic.

The Platform of the Modernisation fund serves as an intermediary for communication and consultation with other stakeholders.

⁷ Beneficiary - an operator, body or firm, whether public or private, responsible for initiating and implementing operations.

⁸ 3-years average 2017-2019. More on <https://monitor.statnipokladna.cz/ucetni-jednotka/00020729/prehled> [partially in English]

⁹ See https://www.sfzp.cz/wp-content/uploads/2021/03/Organizacni_struktura_03-2021.pdf

Detailed institutional arrangements and a description of the responsibilities and competencies of the implementing body is included in the General Programme Document for the Implementation of the Modernisation fund in the Czech Republic (see 4.3 and [web](#)).

Final beneficiaries

Final beneficiaries shall be owners of district heating networks based in the Czech Republic and holding a business licence for Central Heating Supply Systems and District Heating Network operation pursuant to Act no. 458/2000 Coll. Owners without the licence are eligible if the network is operated by a licenced entity. Significant number of projects is expected from electricity generators according to Art. 10c of the Emission Trading Directive.

4.3. Please briefly demonstrate the need for the investment.

When the investment contributes to implementation of a territorial just transition plan, please provide information about the expected contribution of the investment to that plan.

The unique structure of heat and electricity production in the Czech Republic, which makes extensive use of Central Heating Supply Systems, with the dominant use of coal, presents specific challenges on the path to transformation to a low-carbon economy.

(for a more detailed description of this structure please see Annex A¹⁰)

In the field of renewable energy sources, the Czech Republic aims to achieve the share of RES in gross final consumption of 22% by 2030, which is 9 percentage points higher than the 2020 target.

Moreover, under Directive 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources, an indicative target in year-on-year growth of the share of RES in the heating and cooling sector by 1.1% is also set, at the level of the average value in the period 2021-2030.

The Emission Trading Act 383/2012 Coll., implementing the Emission Trading Directive 2003/87/EC including the Article 10d, states that the Modernisation Fund shall be used to finance projects to reduce greenhouse gas emissions, use renewable energy sources and increase energy efficiency, and appoints the SEF as implementing body.

Under the Structural Reform Support Service, the Ministry of Environment of the Czech Republic applied a project for suggesting the modalities and application of the Modernisation fund in the Czech Republic. In this project the European Commission contracted a consortium of ICF and Enviros to deliver recommendations for the modalities of the Modernisation fund aiming development of its implementation in the Czech Republic. Based on the outcomes of the project, on 25th January 2021, the Czech Government adopted a **General Programme Document for the Implementation of the Modernisation fund in the Czech Republic** (available [here](#)), describing 9 areas of support including this particular HEAT scheme. ICF recommended to provide grants for projects of fuel switch from fossil fuels to less carbon intensive fuels in heating industry as a programme with the second most important impact (for more details see Annex B).

¹⁰ The study was prepared by a consortium led by the Czech Technical University (CTU).

In order for the Czech Republic to achieve the long-term EU goals in the field of decarbonisation 2050, specific types of measures are being considered for this priority scheme based on the shift from combustion of fossil fuels into biomass (for details see Annex A and section 4.5) that best meet the objectives of the Modernization Fund, show the required contributions to the goals described in section 4.1 and do not exceed the set cost-effectiveness limits.

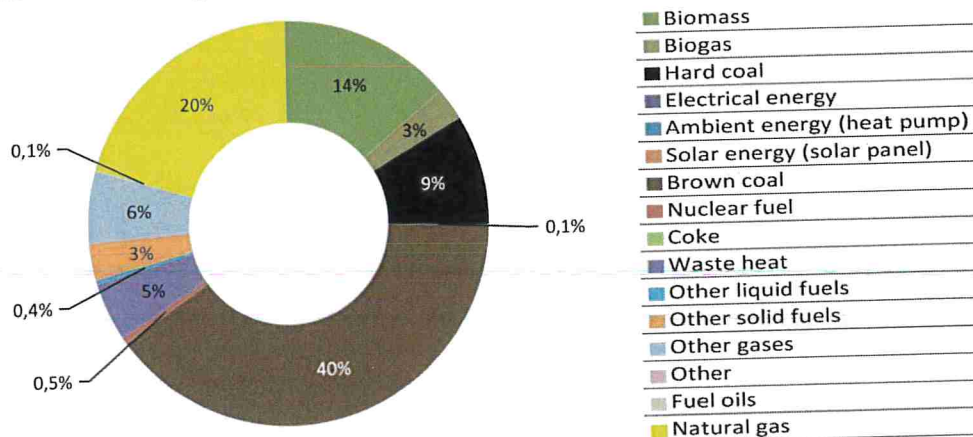
The priority measures selected comply with the aims of the 2003/87/EC Directive regarding improvement of energy efficiency.

As indicated above, the Czech Republic has a large sector of central heating systems which needs to be relatively quickly transformed into a wider use of RES. To achieve the goals of the Czech Republic in the field of reducing greenhouse gas emissions and primary energy consumption by 2030, envisaged in the National Energy and Climate Plan, it is necessary to step up investments in fuel base shifting projects of sources primarily intended for heat supply, with a view to decommission coal and increase the use of RES.

Heat supply systems are in process of switching away from coal as it is intended in the National Energy and Climate Plan of the Czech Republic. In 2020, the Czech Coal Commission recommended to the government to terminate use of coal in Czech energy system by 2038. The transformation of central heating systems away from coal is one of the main prerequisites which the Modernization Fund should support.

There are about 40 coal-fired district CHPs and many more heating plants under the EU ETS in the Czech Republic. The annual heat production of these plants is about 53 PJ. In the ERO (Energy Regulatory Office of the Czech Republic) "Yearly report on the operation of Czech heat supply systems for 2020" (pdf to be downloaded [here](#)), still a significant share of fossil fuels in heat production is apparent (see chart under this paragraph; the order of the fuels in the chart is clockwise). This implies considerable potential for investment in the heating industry with a view to the transition to low-carbon economy. Approx. 40% of households (ca 1.7 million households) is connected to a district heating network and heat producers still use as their fuel predominantly coal in about 49% proportion, which provides an opportunity for decarbonisation efforts as it is easier and more effective to focus on small number of central heating supply systems' operators rather than large amount of individuals. However, these heating plants are very often high-efficient coal-fired EU ETS installations facing increasingly high costs for allowance purchases. Customers connected to the heating supply systems often consider disconnection from the grid and installing local gas-fired heat source in order to avert the carbon-induced costs. To prevent this from happening and in order to make use of the economic pressure from the EU ETS, the heating sector needs substantial investment wave with adequate support scheme. The Modernization Fund should be used to fulfil this role.

Shares of fuels in gross heat production



Regarding **investment needs**, the Association for District Heating of the Czech Republic estimated in 2020 the following amounts:

Investment priority	Investments [mEUR]	Estimated GHGs reduction [mil. tCO ₂ /year]
Renewable energy sources and energy storage	840	2.100
Fuel-switch from lignite/hard coal to natural gas	253	0.900
District heating networks and waste heat treatment	666	0.211
Total	1,759	3,211

According to the report by Knápek et al.¹¹ under EUKI project mentioned before, investment needs in current prices of the given year for the modernization of the heating sector until 2030 in EUR (exchange rate 25 CZK/EUR), after taking into account the escalations of prices of construction works and technology (according to the assumptions presented in the report), are as follows:

- conservative scenario: **4,300 mEUR**,
- optimistic scenario: **3,900 mEUR**.

In order to contribute to implementation of territorial just transition plans, financial allocation of 30% for the coal regions will be reserved under this scheme (see Annex 1, section 2.5), making a contribution to the priority area "just transition in carbon-dependent region" based on Article 10d(2) of the 2003/87/EC Directive.

For better coherence, the programme HEAT has been split into two smaller schemes with more homogenous projects and technology focus. This particular scheme aims at priority projects only, i.e. fuel switch from fossil fuels to RES (in high-efficiency CHP).

Along with above mentioned background substantiation, the SEF launched a call for registration of project intentions at the turn of the years 2020/2021, collecting large database of projects which will be submitted once the call for proposals is launched. On the basis of the preliminary call for project intentions (see Annex E) the budget of the scheme was established. Therefore, the figures used in this scheme are well substantiated.

4.4. Please briefly explain what options were analysed to achieve investment objectives. Please explain why the chosen investment is the most cost effective in achieving investment objectives.

On the basis of an expert study (Annex A), analysing the state of the Czech heating industry, only such investments and technical solutions were proposed that will lead to fulfilment of the goals identified in point 4.1 and will help to meet the ambitious European climate objectives by 2050.

The following technologies have been considered (details please see section 4.5) which reduce the use of fossil fuels, comply with the European Commission's directive, are cost-effective in terms of reducing CO₂ emissions and also show a high level of cost-effectiveness from the point of view of energy efficiency.

Projects are also chosen on the basis of eligibility criteria. Projects which would meet these criteria will be supported on a first come, first served basis. With this approach, the project proponents have clear view of what criteria they need to meet so they take it into account during the project preparation and they know in advance which support they can receive from the Modernization Fund.

Various options of use of Modernisation fund's financial resources were analysed by ICF (Annex B). The ICF study suggests the possibility of large savings in this sector, which correlates with high share of CO₂ emissions of the Czech heat supply systems. The consultants have concluded that an important part of heat supply networks works with sources that have a significant share in the emission load and at the same time, coal represents more than 50 % of their energy sources, which lends support to the implementation of the Modernisation fund in this sector.

The cost-effectiveness requirement is further met by defining a counterfactual investment in order to determine the amount of eligible expenditure. Counterfactual investments applicable under this scheme have been discussed with the European Commission and are discussed more in detail in Annex C – *Analysis of compliance with state aid rules*.

4.5. Please briefly describe the scope of the investment proposal (technologies, main parameters, capacities, mass and energy balances, scope of works/supplies, related infrastructure).

Please provide evidence that the proposed technology/ies are mature (actual system proven in operational environment under comparable conditions and scale and with available references).

The scheme relates to reduction of primary energy consumption and/or reduction of CO₂ emissions through modernisation (reconstruction or replacement) of equipment for combined electricity and heat production in heat supply systems, leading to increased efficiency or change of solid fossil fuel base or type of energy.

Detailed analysis of benefits according to individual technologies is included in Annex D; below, only summary contributions for groups of measures are presented:

Reconstruction or replacement of a heat source in a heat supply network with a change of fuel used or type of energy to renewable energy sources in high-efficiency cogeneration of heat and power:

¹¹ Knápek, J., Valentová, M., Krejcar, R., Vašíček, J., Vecka, J. 2021. Klimaticko-energetické investice v teplárenství 2014–2030. ČVUT v Praze, to be downloaded here:
<https://ekonom.feld.cvut.cz/cs/katedra/lide/valenmi7/cic2030/reports/ipp-teplarenstvi-report-final.pdf>

Number of expected projects with this measure	Emission reductions [ktCO ₂ /year]	Primary energy savings [TJ/year]	Reduction of CO ₂ emissions	Reduction of consumption of primary non-renewable energy
25	1,974	5,198	min. by 20%	min. by 10%

Heat energy storage systems can only be supported as part of a comprehensive project specified above.

Expected number of projects with this measure	Heat capacity/output [MWh/MWt]	Total storage capacity [MWh]	Specific costs [mEUR/MWh]
7	0.24	65	0.028

In the table below, suitable technologies for low-carbon energy transition considered as the most relevant in the Czech Republic are presented.

1. Priority measures grounded in switching to biomass	
1.1 Block/unit consisting of :	- biomass fired grate steam boiler - steam turbogenerator with back-pressure turbine and basic heat exchanger for heat supply systems (usually 90/60°C)
1.2 Block/unit consisting of :	- biomass fired grate steam boiler - steam turbogenerator with condensing turbine with regulated steam extractions for heat supply systems
1.3 Block/unit consisting of:	- biomass fired fluidized bed steam boiler - steam turbogenerator with back-pressure turbine and basic heat exchanger for heat supply systems (usually 90/60°C)
1.4 Block/unit consisting of:	- biomass fired fluidized bed steam boiler - steam turbogenerator with condensing turbine with regulated steam extractions for heat supply systems
2. Priority measures grounded in switching to bio-methane or biogas	
2.1 Cogeneration engine	- piston engine with generator (CHP) - engine cooling system composed of a system of exchangers transferring the removed heat to the heating water of the heat supply systems

→ Detailed budget itemization is discussed in section 6.1 ←

General eligibility criteria of investments in view of meeting medium and long-term national goals

The project must not be in conflict with the outputs of the air quality improvement program for the relevant zone or agglomeration and the National Emission Reduction Program prepared in accordance with the Air Protection Act.

The following types of projects are not supported:

- reconstruction, replacement or construction of energy sources and heat distribution systems that are not part of heat supply networks,
- where disconnection from heat supply networks takes place,

- installation of photovoltaic power plants, including the related accumulation of energy produced,
- focused on the construction of new heat sources, i.e. when the implementation does not seek to modernize or replace existing sources.

Other conditions of support:

- After the implementation of the project, no coal or coal-derived fuels may be burned in the subject of support in question (if it is a stationary combustion source).
- The project implementation period must not exceed 5 years from the moment of project approval.
- The project must be realized in the Czech Republic.
- The applicant must not be a company in difficulty (as per Commission Regulation (EU) No. 651/2014).
- The applicant must not be bankrupt, in liquidation, have no overdue liabilities to state and public budgets, arrears of taxes and it must not be a company with a conflict of interest (as per Act No. 159/2006 Coll., on conflicts of interest, as subsequently amended, including the restrictions set out in Section 4c of the Act; if the applicant is a legal entity, its ownership structure and actual owners must be documented in the sense of Act No. 253/2008 Coll., on selected measures against legitimization of proceeds of crime and financing of terrorism, as subsequently amended.).
- The stationary source for which support is requested must be operated in full compliance with Act No. 201/2012 Coll., On Air Protection and on Amendments to Certain Other Acts, as amended (hereinafter referred to as the "Air Protection Act").

Outcomes: minimum requirements for investments in view of meeting medium and long-term national goals

The implementation of the project must reduce, compared to the initial state:

- CO₂ emissions min. by 20%,
- consumption of primary non-renewable energy min. by 10%.

Acceptable is:

- transition from natural gas or another fossil fuel with higher CO₂ emission factor to biomass or biogas or bio-methane in high-efficient CHP.

In the case of a project for the use of biomass fuels, it is necessary to comply with the sustainability criteria according to Article 29 of Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of energy from renewable sources.

In the case of a project for the use of fuels from biomass, as a transition from natural gas, the following conditions are defined:

- projects for stationary combustion sources covered by Directive (EU) 2015/2193 of the European Parliament and of the Council of 25 November 2015 on the limitation of emissions of certain pollutants into the air from medium combustion plants will only be supported if they guarantee 80% compliance of the emission limit value for emissions of solid pollutants defined by Decree No. 415/2012 Coll. on the permissible level of pollution and its determination and on the implementation of certain other provisions of the Air Protection Act, for sources put into operation on 20 December 2018 or later.
- projects on stationary combustion sources covered by Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) will only be supported if they guarantee lower (the most ambitious) half of the range of values according to the Conclusions on Best Available Techniques (BAT) for solid pollutants,
- there is no increase in NO_x emissions per unit of fuel energy compared to the original state,

- projects cannot be supported in cadastral territories where, according to the maps of five-year moving averages compiled by the Czech Hydrometeorological Institute (in accordance with paragraphs 5 and 6, §11 of the Air Protection Act), one of the air pollution limits set out in point 1 of the Annex 1 of the Act has been exceeded for PM₁₀ or PM_{2.5}.

Mandatory indicators setting minimum requirements for project contributions **as well as** so-called **monitored indicators will be observed** and evaluated within the implemented projects.

Mandatory indicators will be part of the grant application and will be subject to a contractual obligation; they will help to monitor and measure the achievement of specified outputs of the project itself. Fulfilment of mandatory indicators is under the direct control of the project and must be achieved in a specified time frame set down in advance. If the project target values of relevant mandatory indicators would not be fulfilled, a correction of up to 100% (depending on the degree of non-fulfilment) would be applied. *Monitored indicators* are not obligatory, but present a contribution for monitoring of project outputs from the point of view of its benefits to national strategic goals.

Below both mandatory and monitored indicators applicable for a summary of all supported types of technologies are enumerated.

The mandatory indicators include:

- reduction of primary energy consumption in connection with the implementation of the project in GJ per year,
- reduction of non-renewable primary energy consumption in connection with the implementation of the project in GJ per year,
- reduction of CO₂ emissions in connection with the implementation of the project in tonnes of carbon dioxide per year,
- thermal output of a newly built RES in MW_t,
- electrical output of a newly built RES in MW_e,
- amount of thermal energy produced from CHP from RES in GJ per year,
- amount of electricity produced from CHP from RES in MWh per year.

The monitored indicators include:

- reduction of particulate matter (PM) emissions from stationary sources,
- reduction of emissions of suspended PM₁₀ particles from stationary sources,
- reduction of emissions of suspended PM_{2.5} particles from stationary sources,
- reduction of sulphur dioxide (SO₂) emissions from stationary sources,
- reduction of nitrogen oxide (NO_x) emissions from stationary sources,
- reduction of volatile organic compounds (VOC) emissions from stationary sources,
- reduction of ammonia (NH₃) emissions from stationary sources,
- reduction of polycyclic aromatic hydrocarbon (PAH) emissions from stationary sources of air pollution.

The project proponents are further required to:

- submit project documentation for a construction permit, emission assessment, and energy audit together with grant application;
- complete project no later than 5 years from the moment of issuing the Decision of the Minister of the Environment on the provision of funds from the State Environmental Fund of the Czech Republic;

- keep the supported installation without any major changes for at least 10 years after project completion.

These conditions ensure that projects are in advanced stage of preparation and that the projects have specified time frame during which they must materialize.

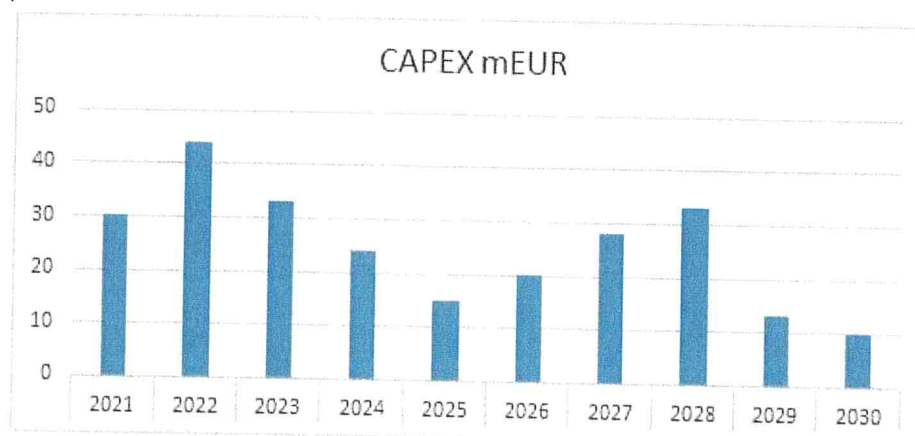
The preliminary conditions were made publicly available and a call for project intentions was launched in order to gain information about the potential of projects that would fall under the program, incl. information about their stage of preparation. The analysis of submitted project intentions shows that applicants put forward technologies that are mature and ready for implementation. These technologies are already in use in some EU ETS installations, e.g. TTS Energo Třebíč (biomass-fired CHP), which proves the maturity of the technology. As the study shows (see Annex A), these technologies are common in the Czech Republic, as well as in other EU member states, and are successfully used, including their combinations. Consequently, investment support of these technologies is a guarantee that the planned savings will be achieved.

4.6. Please indicate direct employment created by the proposed investment (separately for the implementation period, in person x years, and operation period, in number of permanent jobs created).

According to the estimate of the report submitted by ICF S.A. in association with Enviros "Supporting low-carbon transition of the Czech Republic by EU ETS Funding Mechanisms – Deliverable 4 Final; Quantitative analysis of potential impacts from Modernisation Fund deployment" (funded by the EU via the Structural Reform Support Programme and implemented in collaboration with the Czech Ministry of Environment and the European Commission; see Annex B), the reduction of energy consumption in the HEAT programme of the Modernization Fund implementation plan of the Czech Republic should have the direct, indirect and induced employment effect of 15,966 (FTE person-years, without public/private sector leverage), should help to create up to 74 additional jobs, which is 0.22 jobs per unit energy saved/ generated (GWh) by 2030.

4.7. Please provide the investment implementation schedule.

According to the proposals of financing in years contained in projects' intentions submitted in the preliminary call for project intentions, the following investment implementation schedule for projects under this scheme can be anticipated:



On the basis of the investment implementation trend presented in the chart, the scheme implementation schedule for the year 2021 was conceived as follows:

- 1) Launching the 1st call for project proposals: 04/2021
- 2) Start of receiving applications for support: 05/2021

Submission deadline of applications (under the first call): 01/2022

The call is continuous. When the initial disbursement will be depleted, subsequent applications will be submitted to EIB to replenish the funds.

5. Justification for the Modernisation Fund (Articles 6(7)(a), 6(7)(b) and Annex I, point 1.3 of the IR)

5.1. Please provide detailed justification for the Modernisation Fund support, including the confirmation of the compliance of an investment with Article 10d(1) of Directive 2003/87/EC.

The present scheme's proposed investments into measures improving energy efficiency complies with Article 10d(1) of Directive 2003/87/EC. Energy efficiency increase is demonstrated by reduction of primary energy consumption.

No measures aiming at improvement of energy efficiency in energy production facilities using solid fossil fuels would be supported.

Given that this scheme will provide support to renewable power generation, which will lead to significant reduction of GHG emissions, gradual coal phase-out, Just Transition in coal regions, decentralization of power sources as well as better energy efficiency, we are positive that this scheme is fully in line with the aims of the 2003/87/EC Directive, the objectives of the European Union's 2030 climate and energy policy framework, with the objectives of the National Energy and Climate Plan of the Czech Republic as well as the long-term objectives as expressed in the Paris Agreement.

It fully complies with Article 10d(1) in the following aspects: it shall not provide any subsidies to new energy generation facilities that use solid fossil fuels, it will modernise energy systems, including renewable energy and energy efficiency. It also includes the financing of small-scale investment projects (there is no lower threshold for the eligible investments). The scheme will contribute to coal phase-out and decommissioning of coal-fired boilers in CHP facilities.

The **National Energy and Climate Plan** enumerates a complex set of targets for the heating sector. It states that in connection with the ongoing decentralisation of electricity sources, it will be necessary to ensure the overall flexibility of the energy system. From this perspective, heating sources should be more involved in the provision of support services at the distribution and transmission system level. At the same time, thanks to the possibility of using **cogeneration**, production sources could contribute to flexible electricity supplies.

"The evaluation of the potential of high-efficiency cogeneration and efficient district heating and cooling for the Czech Republic" prepared by the Ministry of Industry and Trade in 2015 defines the expected progress in CHP development in 2015–2025 and it results in the following conclusions: The potential for the development of high-efficiency CHP has been identified. Growth of sources with high efficiency cogeneration can also be expected in the area of **biomass** utilisation, biogas stations (including heat transfer from existing sources). **However, the development of these high-efficiency CHP areas is conditional on maintaining stable economic incentives** for investors and resource providers.

– *This target is in accordance with the scheme's investments in high-efficiency cogeneration using biomass and biogas.*

Other Czech strategic documents (such as the **Action Plan for Biomass in the Czech Republic 2012–2020**) also mention the heating sector as one of the sectors with a high potential to use **biomass**, which should at least partially help to replace coal.

– This target is in accordance with the scheme's investments in measures of fossil fuel change to biomass.

Implementation programme document stipulates that **projects with measures on sources for which the combustion of coal** or any other fuel with a higher CO₂ emission factor would not be terminated after implementation **will not be supported**.

5.2. Please provide detailed justification why the investment shall be considered as a priority investment under article 10d(2) of the ETS Directive.

The types of measures proposed for support from the scheme fall into the fields of support mentioned in the article 10d(2) of the ETS Directive:

« At least 70 % of the financial resources from the Modernisation Fund shall be used to support investments in the generation and use of electricity from renewable sources, the improvement of energy efficiency, except energy efficiency relating to energy generation using solid fossil fuels, energy storage and the modernisation of energy networks». Supported measures in the scheme include projects with high-efficient CHP installations using renewable sources only.

Renewable sources of electricity and energy storage are explicitly mentioned in the Art. 10d(2) as well as in the Assessment Guidance Document, Appendix 1, as a priority investment example. Given that no other activities than renewable sources of electricity/heat and energy storage technology will be supported under this scheme, as described in part 4.5, we are positive that this scheme represents priority investment.

6. Costs (Annex I, point 1.4 of the IR)

6.1. Please provide total investment cost breakdown for individual investment projects. The following is an example of a breakdown of investment categories:

- Planning/design fees
- Land purchase
- Building and construction
- Plant and machinery or equipment
- Publicity
- Supervision

In the case of schemes, please provide total investment cost breakdown by components/measures covered by the scheme as described in section 4.5.¹²

Where it is required by the nature of the project, please provide units costs /cost benchmarks (i.e. in case of supply contracts, Just Transition measures, etc.) and/or costs of major components / modules.

¹² e.g. if a scheme comprises renewable electricity generation plants from solar, wind and hydro etc. then provide the cost separately for all type of plants.

The main investment categories are represented by the following shares, as is documented in the study by Knápek et al.¹³, mentioned in the section 4.3:

Type of modernization	Reconstruction of the source		Replacement of the source	
	up to 50 MWt	50-300 MWt	up to 50 MWt	50-300 MWt
Plant and machinery or equipment	85 %	90 %	70 %	75 %
Building and construction	15 %	10 %	30 %	25 %

The detailed breakdown of CAPEX per technology is presented in the following section (please see 6.2).

Other investment categories are:

- *Planning/design fees* are eligible only in case of Design & Build (& Operate) mode, and correspond to ca 0.6%.
- *Land purchase* is qualified as not eligible.
- *Publicity is eligible*, as defined in the [Design manual for projects funded from the Modernisation Fund](#).
- *Supervision* is eligible up to ca 3.0% of direct realization costs of the project.

Budget items in more detail:

Reconstruction of a coal steam boiler to biomass fired grate steam boiler with back pressure turbine

1. Fuel management ca 15%

new or a modification of coal management due to biomass parameters, such as fluctuations in properties, energy density 3 times lower than for coal, specific storage conditions; it must be completely changed:

a. *Fuel intake (car transport vs. train transport, typical of lignite)*

b. *Fuel storage (lignite can be stored in a high pile, wood chips are limited to approx. 6 m)*

c. *Fuel handling (for lignite, a dozer is enough for loading and compaction, together with standard belt conveyors; for biomass: 3 times larger spatial volume is handled; 1 ton of coal represents from 1.6 to 1.8 ton of biomass; the phenomenon of spontaneous combustion and clumping)*

d. *Metal and oversize separator (crusher recommended)*

2. Boiler including accessories: 30-35%

- *Boiler pressure system depending on the design and parameters (usually drum, evaporator, water heater, steam superheater)*

- *Fuel tank in front of the boiler, including protection against blazing (monitoring, fire-fighting equipment)*

¹³ Knápek, J., Valentová, M., Krejcar, R., Vašíček, J., Vecka, J. 2021. Klimaticko-energetické investice v teplárenství 2014–2030. ČVUT v Praze, to be downloaded here: <https://ekonom.feld.cvut.cz/cs/katedra/lide/valenmi7/cic2030/reports/ipp-teplarenstvi-report-final.pdf>.

	<ul style="list-style-type: none"> Supporting structure of the boiler, auxiliary structures (galleries and service platforms, stairs, floor grilles) 	
	<ul style="list-style-type: none"> DENOX – reduction of nitrogen oxide emissions, reagent injection system into the combustion chamber + reagent tank (urea) (if emissions of around 180 mg / Nm³ are required) 	
	<ul style="list-style-type: none"> Fittings (fine equipment), Sets (Coarse equipment), blowdown expander, chemical dosing, condensate tank including water and condensate pumps 	
	<ul style="list-style-type: none"> Silencers (start-up, safety valve, air intake silencer) 	
	<ul style="list-style-type: none"> Boiler grate (water or air cooled according to the considered fuel, in the case of a fluidized bed boiler) 	
	<ul style="list-style-type: none"> Steam air heater 	
	<ul style="list-style-type: none"> Air ducts including air fan (air supply under the grate sometimes by an independent fan; more massive fan in a fluidized bed boiler), flue ducts with flue gas fan including flue gas recirculation (with flue gas dilution fan according to boiler design reagent; it does not have to be used, but the demands on the DENOX system increase, including the operating consumption of the reagent) 	
	<ul style="list-style-type: none"> Insulation, linings 	
	<ul style="list-style-type: none"> Removal of residual products (slag / bottom ash) – extractors, storage vessel (silo or container) 	
	<ul style="list-style-type: none"> Cloth filter (flue gas dedusting) including ash removal, its storage (transporter / pneumatic transport + silo) 	
3.	Steam turbine including oil management and with condenser (for condensing turbine) and exchanger (water heating for sampling or back pressure) – and its removal if the original technology was like CHP	up to 30%
4.	Connecting pipes modification of the connecting part in particular, new pipes in case of total change of spatial arrangement	up to 2%
5.	Feed pump in case of change of feed water parameters and degasification system if there is none yet	up to 4%
6.	Feedwater treatment Chemical water treatment plant for water clarification and preparation of demineralised water / reverse osmosis	up to 4%
7.	Electrical part – high current cabling for drives, lighting of technology and space around the device, it is not part of the boiler room lighting as such	up to 4%
8.	Measurement and regulation low current, sensors, gauges, actuators, emission measurement and control system (visualization, communication, data storage), source of instrumental and drive air	up to 10%

9. Chimney <i>construction of a new one / modification of the existing one – reduction of the cross-section if necessary and lining</i>	up to 4%
10. Construction work for all foundations for technologies under construction	up to 20%

The projects will be subject to compliance with the legislation on public procurement and program's Guidelines of the Fund for public procurement.

Investment costs by investment categories will be monitored in particular through mandatory financial indicators of submitted projects.

6.2. With respect to the cost breakdown provided in section 9.1 above, please identify the cost components/categories/types which will be funded by the Modernisation Fund (Amount and/or percentage for each component/category/type) and/or the cost eligibility criteria to be applied to MF funding.

Suitable technologies for the transition to low-carbon energy

(25.5 CZK/EUR exchange rate is used)

Below is a complete list of technological variants that can be considered according to the rules of the scheme. The technical parameters are set as standard for the conditions of the Czech heating industry. Investment costs were determined on the basis of market research, consultations with technology suppliers, specific implementations in recent years in the Czech Republic and a study of submitted projects in the currently open call of the SEF.

For all technological variants (unless stated otherwise in the text), installation into the existing boiler room building is considered, incl. external fuel management and modification of fuel storage area (necessary in case of biomass), in relevant cases according to BAT conditions also flue gas cleaning with fabric filter and reduction of nitrogen oxide emissions (flue gas denitrification) DENO_x (SNCR method – selective non-catalytic reduction).

1) Transition to biomass (CHP)

1.1 Block/unit consisting of:

- biomass fired grate steam boiler

Main parameters	Power output	40 MWt (50 t/h)
	Steam output pressure	3.8 MPa
	Steam output temperature	320°C
	Boiler efficiency	86.5 %

Price of the boiler (without turbine): 15.7 mil. EUR

1.1.1 Variant

- biomass fired grate steam boiler with back pressure steam turbine and basic heat exchanger for heat supply systems (usually 90/60°C)

Turbine parameters	Power output	9 MWe
	Steam output pressure	0.2 MPa (hot water heating)
	Electric efficiency	23 %
	CHP efficiency	85 % (total full CHP regime)

Price of the turbine: 6.3 mil. EUR

Total CAPEX: 22 mil. EUR

1.1.2 Variant

- biomass fired grate steam boiler with condensing steam turbine with steam extraction

Main parameters	Power output	10.5 MWe
	Steam output pressure	0.015 MPa (condensation)
	Electric efficiency	29% (in full condensation regime)

Price of the turbine: 7.1 mil. EUR

Total CAPEX: 22.7 mil. EUR

1.2 Block/unit consisting of:

(it is an alternative to the previous technical solution and changes only the design of the boiler, which is more efficient, but also more expensive – increased efficiency of steam production on the boiler then leads to increased overall efficiency – the same production behind the boiler and turbine)

- biomass fired fluidized bed steam boiler

Main parameters	Power output	40 MWt (50 t/h)
	Steam output pressure	3.8 MPa
	Steam output temperature	320°C
	Boiler efficiency	90%

Price of the boiler: 17.6 mil. EUR

1.2.1 Variant

- biomass fired fluidized bed steam boiler with back-pressure steam turbine together with basic heat exchanger for heat supply system (usually 90/60°C)

Turbine parameters	Power output	9 MWe
	Steam output pressure	0.2 MPa (hot water heating)
	Electric efficiency	23%
	CHP efficiency	85% (total full CHP regime)

Price of the turbine: 6.3 mil. EUR

Total CAPEX: 23.9 mil. EUR

1.2.2 Variant

- biomass fired fluidized bed steam boiler with condensing steam turbine with steam extraction for heat supply system

Main parameters	Power output	40 MWt (50 t/h)
	Steam output pressure	0.015 MPa (condensation)
	Electric efficiency	29% (in full condensation regime)

Price of the turbine: 7.1 mil. EUR

Total CAPEX: 24.7 mil. EUR

2) Transition to biogas or bio-methane

2.1 Variant

- bio-methane piston engine with generator
- engine cooling system composed of a system of exchangers transferring the removed heat to the heating water of the heat supply system

Main parameters	Electric power output	31 MWe
	Thermal power output	30 MWt
	Total efficiency	94%

Total CAPEX: 25.5 mil. EUR (*except. construction on a greenfield site*)

2.2 Variant

- biogas piston engine with generator
- engine cooling system composed of a system of exchangers transferring the removed heat to the heating water of the heat supply system

Main parameters	Electric power output	5 MWe
	Thermal power output	5.2 MWt
	Total efficiency	86%

Total CAPEX: 4.7 mil. EUR

All variants can be completed with a heat storage system. Typical examples of hot water accumulators are described in next tables.

Main parameters	Accumulation capacity	22 MWh
	CAPEX (incl. installation, without new engine room connected to the existing system)	0.6 mil. EUR

Main parameters	Accumulation capacity	45 MWh
	CAPEX (incl. installation, with new engine room on a greenfield site)	2.2 mil. EUR

General conditions for eligibility of expenditures are the following:

Support may only be granted for eligible expenditure that meets all of the following conditions:

- is in accordance with the legal regulations of the Czech Republic and the EU,
- is in accordance with the program, the relevant call and the issued methodological guidelines,
- is spent in accordance with the 3E Rule (economy, efficiency, effectiveness),
- complies with the terms of the GBER,
- is appropriate, i.e. corresponds to the usual prices at the place and time,
- is duly identifiable, provable and verifiable,
- is directly and exclusively connected with the implementation of the project, is created at the time of its implementation, and is part of its budget,
- is eligible if the cost was incurred after the application was submitted.

The basic eligible costs related to the investment include in particular:

- Direct realization costs: expenditures on construction works, supplies and services directly related to the project, including the investments made. In the case of the Design & Build (& Operate) mode, it is possible to include, for example, expenditures on related project documentation into direct realization expenditures.
- Activities of professional technical or author's supervision, as well as ensuring occupational health and safety – eligible maximum 3.0% of direct realization costs of the project
- Publicity measures: expenditure on publicity measures that were incurred in direct connection with the project and in connection with the requirements for ensuring publicity are eligible; publicity requirements will be set out in the call and in the [Design manual for projects funded from the Modernisation Fund](#).
- VAT: Value added tax can be considered eligible only for recipients who cannot claim a deduction of input value added tax in the sense of relevant national legislation (Act No. 235/2004 Coll. concerning value added tax, as subsequently amended). If the right to a VAT refund arises subsequently, the beneficiary is obliged to return the relevant aid, regardless of whether or not he asserts the right before the financial administration authorities.
Eligible VAT applies only to payments which are considered eligible. If the payment is eligible only partially, then the VAT relating to that payment is eligible from the same aliquot part.

Ineligible expenditures, i.e. expenditures for which support cannot be granted are the following:

- measures that do not correspond to the objectives of the program and the conditions of the relevant call,
- purchase of used equipment,
- expenditures for the processing of project documentation and project activities (with the exception of the Design & Build (& Operate) regime),
- expenditure on the purchase of real estate,
- fees for the withdrawal of land from the agricultural land fund or land intended for the performance of forest functions and for the establishment of easement,
- taxes – VAT (except as stated above), direct taxes, gift and inheritance tax, real estate tax, real estate transfer tax, road tax, customs duties,
- expenditure on providing relevant statements,
- induced investments that are not exclusively and directly linked to the purpose of the project,
- loan instalments, interests,
- extra-works above the amount of eligible less-works,
- administrative fees (e.g. notary fees, cadastre deposits, fees for issued building permits, fees for discharging wastewater into surface waters),
- budget reserve,
- payroll and other staff expenses, overheads and operating expenses.

As can be seen from other sections of this scheme application, GBER thresholds are always the limit for total investment costs to be covered.

Input data and methodology for calculating the capital intensity of CO₂ reductions and primary energy savings

1. Resource usage time - Load factor (LF)

The amendment to the POZE Act (Act on Supported Energy Sources) and the ERO (Energy Regulatory Office) price decision for 2022 stipulate a green bonus for existing cogeneration units (CU) up to 5 MW in the regime of 3000/4400 hours/year. To calculate the investment intensity, we choose LF 3000 hours/year as a case covering a wider range of applications.

2. Emission factor (EF)

The emission factor of biomass (B) for the input fuel is 0 kg/MWh, for lignite and other fuels see the table below. It should be emphasized that these are emission factor values that relate to the energy supplied in the fuel (power input), not values related to energy production (power). For this reason, the values given in Tab. 1 do not include energy conversion efficiency, i.e. combustion efficiency is not included.

Tab.1: CO₂ emission factors for energy supplied in fuel in the Czech Republic

Fuel/energy	Emission factor (t CO ₂ /MWh)
Hard coal	0.330
Lignite	0.352
Coke	0.385
Lignite briquettes	0.346
Fuel and other gas oil	0.267
Low sulphur fuel oil (sulphur up to 1 % w/w)	0.279

High sulphur fuel oil (sulphur above 1 % w/w)	0.279
Natural gas	0.2
Liquefied petrol gas (LPG)	0.237
Electricity	0,86

*Source: Decree No. 140/2021 Coll. on energy audit, as amended.
Ministry of Industry and Trade. Prague 2021.*

3. Energy efficiency (E)

The energy efficiency values given below in the examples demonstrating the adopted methodology are taken from energy practice (for new technologies it can be documented by supplier offers). These values can be further updated, for example by confronting BAT with the offers of reputable suppliers.

4. CAPEX

The values of typical investment costs in the conditions of the Czech Republic are given by the compilation of the following sources:

- Specific applications of subjects interested in subsidies from the Modernization Fund
- Recently realized investments and current tenders
- Recommendations of major suppliers (Siemens)

For the purpose of standardization, it is appropriate to choose the power of the source (e.g. 50 MWt). Therefore, if the practical data relate to another performance, it is necessary to convert CAPEX to a standardized value.

5. Calculation methodology

We have to compare technologies and savings on the basis of the same output, for heating technologies it is the same output value of thermal energy (MWh or GJ). We will explain the methodology on several specific examples from practice.

Example 1: Conversion of an old heating lignite-fired boiler to a new biomass fired boiler with highly efficient cogeneration.

We will choose the net heat output P_t of the old Lignite-fired boiler and the new cogeneration biomass boiler (or the heat output of motor cogeneration or SGC – steam-gas cycle). In the case of cogeneration, the P_e of electrical power is added to it. Depending on the type of gas cogeneration (back pressure, condensation sampling, engines, SGC), this electrical output differs.

Emission intensity of new investment tCO_2/year :

$$\frac{P_t + P_e}{E_{total}(B)} \times EF(B) \times LF \quad (1)$$

This must be compared with the initial state, where the heat is generated by the old heating Lignite-fired boiler and for the equivalent production of electricity it is necessary to accept the assumption of separate condensing production from Lignite:

Emission intensity of the initial state tCO_2/year :

$$\left(\frac{P_t}{E_t(L)} + \frac{P_e}{E_e(L)} \right) \times EF(L) \times LF \quad (2)$$

Resulting tCO₂ savings/year:

Emission intensity of the initial state - emission intensity of the new investment

$$\left(\left(\frac{P_t}{E_t(L)} + \frac{P_e}{E_e(L)} \right) \times EF(L) - \frac{P_t + P_e}{E_{total}(B)} \times EF(B) \right) \times LF \quad (3)$$

After insertion of correct values from energy practice (can be evidenced by supplier offers): $((40/0.85 + 9/0.35) \times 0.352 - (49/0.87 \times 0.0)) \times 3,000 = 76,848 \text{ t CO}_2/\text{year}$, which represents a saving of 100% of the initial state. It satisfies the following condition without difficulty: *The implementation of the project must reduce, compared to the initial state, CO₂ emissions min. by 20%.*

We will also determine other parameters:

Resulting primary energy savings:

Baseline primary energy consumption - Primary energy consumption of the new investment

$$\left(\frac{P}{E(L)} - \frac{P}{E(B)} \right) \times LF \quad (4)$$

After inserting relevant values, we can see that the resulting value of 22,2% meets the condition of saving at least 10% of primary energy.

Capital intensity of conversion

The capital intensity of CO₂ and primary energy savings is then simply determined by the relationships:

$$\frac{CAPEX}{\left(\left(\frac{P_t}{E_t(L)} + \frac{P_e}{E_e(L)} \right) \times EF(L) - \frac{P_t + P_e}{E_{total}(B)} \times EF(B) \right) \times LF} \quad (5)$$

$$\frac{CAPEX}{\left(\frac{P}{E(L)} - \frac{P}{E(B)} \right) \times LF} \quad (6)$$

CAPEX values can best be obtained on the basis of verified offers from reputable suppliers that respect the price level and market situation in the country. CAPEX values always lie in a certain interval depending on the following parameters:

- Resource performance (in general, specific investment costs decrease with increasing output)
- Specific technological arrangement (steam production is more demanding than hot water production; steam output in tons/hour needs to be converted to thermal output in MW_t – the conversion factor depends on the parameters of the steam produced, i.e. temperature and pressure, in a case of a steam boiler, the coefficient of 1.3 would be used.
- Development of inflation (in 2021 supplier prices increased significantly due to rising prices of basic materials).

For the above-described example, we valued CAPEX of the technology (see Annex A, Annex 1 "Proposal of suitable technologies of the Czech Republic heat sector for the transition to low-carbon energy") at the level

of 560 million CZK (= 21.96 mil. EUR). For the conversion from CZK to EUR, we will use the exchange rate of 25.5 CZK/EUR¹⁴, and after substituting into the above-mentioned relations, the capital intensity of CO₂ and primary energy savings result in (for calculations see Annex D):

Capital intensity of CO ₂ savings	286 EUR/tCO ₂ /year
Capital intensity of primary energy savings	454 EUR/MWh/year

→ Detailed calculations of contributions for each individual technology can be found in Annex D ←

The characteristics of emission reduction and energy savings parameters in the case of biomass combustion are the following:

- The emission factor in the case of biomass is 0. This implies that the criterion of minimum CO₂ savings is always met, the savings are automatically 100%. However, it should be noted that massive deployment of biomass may have other undesirable environmental consequences. Specifically, emissions other than CO₂, especially dust emissions, are practically the same as coal combustion, and the parameters are, on the contrary, significantly worse than for gas combustion. Support of conversion to biomass should therefore not be directed to areas where the population suffers from a high air pollution load (in the case of the Czech Republic, for example, the Ostrava region).
- On the contrary, the criterion of minimum primary energy savings is more difficult to achieve for biomass. Biomass is a more problematic fuel for the combustion process than coal and worse than natural gas. It also follows that the capital intensity of primary energy savings is high for biomass.
- A biomass steam boiler typically has lower energy efficiency compared to a natural gas boiler, but as a renewable source of energy, for biomass technologies the criterion of minimum non-renewable primary energy savings is comfortably achieved.

The results documented for our selected example from practice confirm the above statements.

The data will be reported based on the outputs (see Mandatory and Monitored indicators, section 4.5) of projects submitted within the grant scheme, and in accordance with the specified Regulations. The relevant value will be based on the types of measures and projects (see the basic supported project types, section 4.5) in accordance with min. eligibility criteria on energy efficiency and CO₂ emissions reduction (see Outcomes – minimum requirements for investments in view of meeting medium and long-term national goals, section 4.5).

Emission factors used in the calculations above are in accordance with the GHG Inventory Reporting of the Czech Republic.

The cost-effectiveness values are in detail included in Annex D.

We are demonstrating an improvement in energy efficiency by reducing primary energy consumption. The specific contributions calculated (according to the CTU study, Annex A) for investments within the support from the Modernization Fund are shown in Annex D.

6.3. Explain how you have estimated the investment cost.

- Please provide the year of the preparation of the investment cost.

¹⁴ According to the reference exchange rates of the European Commission: <https://eur-lex.europa.eu/legal-content/CS/TXT/PDF/?uri=CELEX:C2021/052/02&from=CS>

- Please indicate whether the costs are based on basic/detailed design, or pre/post tendering estimates, or contractual estimate. The most recent cost information should be used.
- If costs are based on finalised public procurement procedures, please provide a list of; finalised procedures, resulting contracts - their scope and price.
- Please provide justification of all investment costs - benchmark construction cost against similar projects (adjusted for differences in cost levels and year of cost estimate). Benchmark design and supervision cost items (as a percentage of overall costs) against 'normally' expected levels for the type of project.
- In case of soft investments targeting Just Transition in carbon-dependent regions: salaries benchmarked against market rates/salary bands.

The preparation of the scheme budget started during the year 2020, when ICF analysed the investment gaps and potential. Based on these recommendations, the Czech Government approved the General Programme Document in January 2021, which states that 26 % of the overall Modernisation Fund revenues available for the Czech Republic shall be used for the HEAT programme.

For the year 2021, only 3 programmes (dealing with: 1) **modernization of heat supply systems – Programme HEAT**, 2) new renewable sources of energy – Programme RES+, and 3) improving energy efficiency and reducing the emissions of greenhouse gases in industry in EU ETS – Programme ENERGETS) were chosen as having the highest impact out of 9 programmes on energy efficiency and GHG emissions reduction. Therefore the Committee for the Modernisation Fund decided to make use of the 2021 revenues as follows:

Estimated financial sources	
Number of auctions from 1.1.2021 to 17.9.2021	92
EUAs per auction (equal for each)	512,223
EUAs auctioned from 1.1.2021 to 17.9.2021 (total)	47,124,500
EUAs auctioned from 1.1.2021 to 17.9.2021 (CZ MF)	14,150,744
2021 average EUA price EUR/EUA (from 1.1.2021 to 27.7.2021)	46.51
Value of CZ MF share auctioned from 1.1.2021 to 17.9.2021 (EUR)	550,000,000
<i>Source: EEX, EUA Primary Market Auction Report 2021 (cited 12.4.2021): https://www.eex.com/en/market-data/environmental-markets/eua-primary-auction-spot-download</i>	
Required for the first disbursement (non-priority projects only)	93,000,000
Amount in EUR earmarked for HEAT scheme in 2021:	60,000,000
Amount in EUR earmarked for ENERGETS scheme in 2021:	33,000,000
Required for the 1 st + 2 nd disbursement (priority projects only)	320,000,000
Amount in EUR earmarked for priority HEAT scheme in 2021:	30,000,000
Amount in EUR approved for programme RES+ in 2021:	202,000,000
October investment increase in EUR for programme RES+ in 2021:	58,000,000
Amount in EUR earmarked for priority ENERGETS scheme in 2021:	30,000,000

In the preliminary call for project intentions, a total of 555 project intentions were accepted for the whole HEAT programme. Data from the preliminary call for project intentions were analysed, ineligible projects were excluded and eligible expenditure (in total, 25 project intentions were evaluated as eligible for this scheme) assessed and used to determine the size of the scheme.

The scheme budget was determined on the basis of cost data according to the CTU study (see Annex A), and on estimation of project proponents' interest from the preliminary call for project intentions (please refer to Annex D for detailed calculations).

All projects comply with minimum requirements for investments (for more details see section 4.5).

No soft investments targeting Just Transition in carbon-dependent regions are projected in this scheme.

7. Financing Details (Articles 4(5) and Article 6(7)(e) and Annex I, points 1.5, 1.6, 1.7 of the IR)

7.1. Is the present investment supported with other EU/National funds/support mechanisms?

Yes ☐

No ☒

7.2. If Yes, please provide detail (which funds, measures, support value, type of costs covered and other relevant information)

Please note, that provided information about contributions from other Union and national instruments shall allow to assess whether the amounts requested from the Modernisation Fund are not intended to cover the same costs of the investment as those financed by another Union or national instrument (double funding of the same costs is not allowed)-(art. 6.7.e of the Implementing Regulation).

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7.3. Please specify the total requested amount of the financing for the investment proposal from the Modernisation Fund (in EUR), a maximum co-financing rate and a form of financing (grant, loan, etc.).

The requested amount for this scheme is 250,000,000 EUR in total and 30,000,000 EUR for the first disbursement under this application. There will be no co-financing from other Union or national instruments. Modernisation fund co-financing rate is between 45 and 80 % of eligible costs in line with GBER.

The maximum amount of support in the projects of this scheme (i.e. the threshold for individual notification) is EUR 15 million.

The support to the final beneficiaries will be provided in the form of grants.

7.4. Please provide the annual financing plan showing the total planned financing resources and the planned support from the Modernisation Fund and other sources of financing for the investment.

The support will be provided after the decision of the Minister of the Environment and the grant agreement concluded with the SEF in the form of continuously paid ex post subsidies, i.e. on the basis of documented eligible expenses (payment requests will always be backed up by copies of invoicing and bank statements, or other documents) and documents proving meeting of the conditions set out in the Programme Implementation Document together with the relevant call.

The SEF will not provide pre-financing, soft loans, guarantees nor financial instruments.

The annual financing plan is presented in section 4.7, the total planned financing resources and the planned support from the Modernisation Fund are presented in sections 7.3, 3.5 and 3.5.

Subjects producing heat obtaining support from the Modernisation Fund are bound by the conditions of its relevant calls to secure the costs remaining after receiving the aid from the Modernisation Fund.

8. State Aid (Article 6(7)(c) and Annex I, point 1.8 of the IR)

8.1. Does the investment involve granting State aid? (in the meaning of Article 107(1) of the Treaty on the Functioning of the European Union)

Yes ☒

No ☐

8.2. If Yes, please provide evidence as applicable:

- a) the Commission decision of non-objection on the national aid measure;
- b) reference under which the block-exempted measure has been registered (State aid number attributed by the Commission's electronic notification system referred to in Article 11 of Regulation (EU) No 651/2014) (GBER) or in case of new measure, the expected date of transmission of summary information on the measure as per. Article 11 of GBER.

Please specify total eligible costs as well as the aid intensities and any other relevant condition, based on the State aid decision /applicable GBER provisions.

Please confirm that the total amount requested from the Modernisation Fund and other Union and national instruments (total State aid) does not exceed the amount and percentage allowed by the State aid decision/GBER.

State aid intensities are in force at the time of submission of the scheme (10/2021), in case of relevant legislative rules update (GBER rules in particular) the scheme will be updated in accordance with all EU and national requirements.

The maximum amount of support in the projects of this scheme is thus EUR 15 million. **The scheme complies with the GBER and its Article nr. 46.** Only projects that meet the conditions of the GBER and do not exceed the limit for individual notification will be supported from the scheme.

This procedure was preliminarily consulted with the Czech Office for the Protection of Competition (ÚOHS) and at the same time we submitted the relevant documents to this Office for inspection. No fundamental observations were made so far; however, cooperation with the Office will continue.

The reference registration number under which the block-exempted measure has been registered in the Commission's electronic notification system is the following: **SA.62857**.

The maximum aid intensity according to GBER is defined below. The relevant article of the General Block Exemption Regulation (GBER) is Article 46 – Investment aid for energy efficient district heating and cooling.

Applications submitted under announced calls that do not reach the GBER thresholds will be evaluated and approved on an ongoing basis after the submission of the application for support or within the deadline set in the text of the call.

Applications submitted under the announced calls that exceed the GBER thresholds will be submitted individually for assessment by the European Investment Bank; a decision issued by the European Commission will be provided. Individually submitted applications must have a decision of the European Commission on state aid issued before they can be submitted for assessment.

Support to final beneficiaries

Given the nature of the projects, the aid will be granted under a public aid scheme under Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in accordance with Articles 107 and 108 of the Treaty (hereinafter only "GBER"). The aid will be disbursed as a percentage of eligible expenditure, which may not exceed the GBER aid intensities set out below.

Relevant article of the General Block Exemption Regulation (GBER) is the following:

Article 46 – Investment aid for energy efficient remote heating and cooling (sources)

This support can be used for all other projects of heat supply networks (counting complex ones), including the installation of a cogeneration unit.

Enterprise / support (%)	Prague	Other regions
Large	45	60
Medium	55	70
Small	65	80

The above aid intensities are effective for the duration of the existing state aid rules.

All the above mentioned aid amounts must take into account counterfactual investment when determining the eligible expenditure (scenario without aid is indicated). The applicant quantifies the cost of the counterfactual investment/scenario that could be implemented without the aid and is considered less environmentally friendly. These costs are deducted from the costs of project implementation and the resulting amount is the eligible costs for the calculation of the maximum public support. The percentage of aid intensity according to the relevant GBER, size and location of the enterprise will then be applied to these costs.

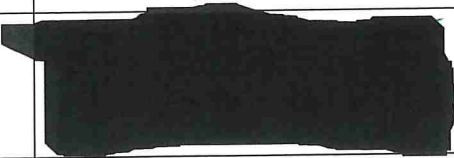
The method of quantifying the counterfactual investment for various cases is described in Annex C.

Alternatively, it would be possible to provide support under Commission Regulation (EU) No. 1407/2013 of 18 December 2013 on the application of Articles 107 and 108 of the Treaty on the Functioning of the European Union to *de minimis* aid.

8.3. If No, please attach a statement evidencing that support for the investment proposal does not constitute State aid within the meaning of Article 107(1) of the Treaty. The statement should be signed either by the national authority responsible for the implementation of the Modernisation Fund or by the national

competent authority responsible for State aid and should include either a reference to a Commission decision or <u>detailed</u> reasoning why the support does not constitute State aid.
—

9. Declaration of compliance (Article 6(7)(d) and Annex I, point 1.9 of the IR)
9.1. Please attach a declaration of investment compliance with the applicable requirements of Union and national laws. The declaration should be signed by the national authority responsible for the Modernisation Fund.
Statutory declaration – Declaration of compliance (Please see Annex F)

10. Endorsement of Authority Submitting the Investment Proposal	
Name:	Jan Kříž, Deputy Minister, Ministry of the Environment of the Czech Republic
Signature:	
Date:	14/09/2021

Annex 1. Information required under Annex I point 2 of the IR

Additional information relating to Schemes:

1. Scheme managing authority (Annex I, point 2.1 of the IR)	
1.1. Name of the scheme managing authority	State Environmental Fund
1.2. Address	Olbrachtova 2006/9, 140 00 Praha 4, Czech Republic
1.3. Website	https://www.sfzp.cz/en/
1.4. Main contact:	
Name	Ivo Marcin
Position in the Organisation	Director of the Department of the State Fund Strategy and International Cooperation
Email	ivo.marcin@sfzp.cz
Telephone Number	+420 267 994 148
Mobile Number (optional)	+420 736 756 015

2. Information about the scheme (Article 4(2) and Annex I, points 2.2-2.3 of the IR)

2.1. Please provide a general description of the entities in charge of initiating or initiating and implementing projects under the scheme. Please specify development stage of the scheme.

The final beneficiaries targeted by the scheme are owners of heating infrastructure according to Act No. 458/2000 Coll. on Business Conditions and the Performance of State Administration in the Energy Sectors and on Amendments to Certain Acts who have a license for the production of thermal energy and/or electricity and a license for the distribution of thermal energy or owners of heating infrastructure who do not have a license, but the infrastructure is operated by an entity with the relevant licenses.

The licenses mentioned are granted by the Energy Regulatory Office (ERO) pursuant to § 5 of Act No. 458/2000 Coll., on business conditions and public administration in the energy sectors and amending certain laws (the Energy Act) as subsequently amended.

The development stage of the scheme is "in implementation" – calls were launched and some project applications have already been received.

2.2. Please indicate whether the proposal concerns:

- an existing scheme¹⁵ ☐
- a new scheme ☒

2.3. Please specify total volume of the scheme.

The total volume of the scheme is 250,000,000 EUR.

2.4. Please specify the amount requested as the first disbursement for the scheme.

The first requested disbursement amounts to 30,000,000 EUR.

2.5. Please provide location of the investment activity and provide the list of NUTS 2 locations concerned by the scheme.

Location of the investment activity is the whole Czech Republic, i.e.: CZ01 Praha, CZ02 Střední Čechy, CZ03 Jihozápad, CZ04 Severozápad, CZ05 Severovýchod, CZ06 Jihovýchod, CZ07 Střední Morava, CZ08 Moravskoslezsko. In these, the Just Transition regions are the following: CZ04 Severozápad and CZ08 Moravskoslezsko.

2.6.	Financial Start Date	2021	Financial Completion Date	2030
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¹⁵ In the meaning of recital 3 of the Implementing Regulation (2020/1001).

Annex 2. Information required under Annex I point 3 of the IR

Additional information relating to proposals other than Schemes:

1. Project proponent (Annex I, point 3.1 of the IR)	
1.1. Name of the project proponent	
1.2. Address	
1.3. Website	
1.4. Main contact:	
Name	
Position in the Organisation	
Email	
Telephone Number	
Mobile Number (optional)	

2. Information about the project (Annex I, points 3.2-3.5 of the IR)

2.1. Please specify location of the project. Please include geographic coordinates of the investment activity and provide the list of NUTS 2 locations concerned by the proposal.

2.2. Please specify total investment of the project.

2.3. Please indicate the development stage of the project.

2.4. Please list mandatory permits obtained or to be obtained.

2.5.	Financial Start Date		Financial Completion Date	
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APPENDIX 4

Investment proposal submission form for priority investments

MODERNISATION FUND
Accelerating the transition to climate neutrality

**Investment proposal submission form
for priority investments**

11/02/2021

MODERNISATION FUND – Accelerating the transition to climate neutrality

✉ modernisation-fund@eib.org

<https://modernisationfund.eu/>

Appendix 4 Investment proposal submission form for priority investments

for submission of the information on priority investments in accordance with Article 10d(2) of ETS Directive¹

1. Submission information		
1.1. Targeted Investment Committee ²	S1/2021	
1.2. Priority order for assessment of priority investments ³	<p>By Submission Date - Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>If NO or for proposals submitted in batches: Please specify Priority Order: Reference Number</p> <p>P-1: Scheme (Part A – Priority): Support for photovoltaic power plants with installed capacity up to 1 MW <i>of the Programme RES+ (CZ)</i></p> <p>P-2: Scheme (Part B – Priority): Support for photovoltaic power plants with installed capacity above 1 MW <i>of the Programme RES+ (CZ)</i></p> <p>P-3: Scheme (Part A – Priority): Modernization of energy sources <i>of the Programme HEAT (CZ)</i></p> <p>P-4: Scheme (Part A1 – Priority): Modernization of energy sources <i>of the Programme ENERGETS (CZ)</i></p>	
1.3. Is the proposal a scheme? If yes, please fill in Annex 1 of this Form. If no, please fill in Annex 2 of this Form.	Yes <input type="checkbox"/>	No <input type="checkbox"/>

2. General information

¹ Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Union and amending Council Directive 96/61/EC with amendments (ETS Directive)

² Please provide the targeted Investment Committee date in form of semester Sx and year.

³ As per article 4.3 of the Implementing Regulation.

2.1. Title of the investment	Scheme (Part A): Support for photovoltaic power plants with installed capacity up to 1 MW <i>of the "RES+" Programme (New renewable energy sources)</i>				
2.2. Investment proponent / Managing authority	State Environmental Fund of the Czech Republic				
2.3. Beneficiary Member State	Czech Republic				
2.4. Priority area(s) based on Article 10d(2) the investment targets	<input type="checkbox"/> generation and use of electricity from renewable sources, <input type="checkbox"/> energy storage and the modernisation of energy networks <input type="checkbox"/> just transition in carbon-dependent region				
2.5. Total investment costs in EUR (with and without VAT) / total volume of the scheme	Total investment costs: <ul style="list-style-type: none"> • 663,770,000 EUR with VAT and • 548,570,000 EUR without VAT Total volume of the scheme (amount of support from the Modernization Fund): <ul style="list-style-type: none"> • 192,000,000 EUR 				
2.6. Requested amount of the financing from the Modernisation Fund in case of the project (EUR) or In case of schemes requested amount for the first disbursement from the Modernisation Fund (EUR).	Requested amount for the first disbursement: <ul style="list-style-type: none"> • 39,000,000 EUR 				
2.7. Please provide a NACE ⁴ code for the economic activity (More than one code may be relevant in some cases).	<table border="1"> <thead> <tr> <th>Code</th><th>Pro-rata share of overall investment (%)</th></tr> </thead> <tbody> <tr> <td>D.35 Electricity, gas, steam and air conditioning supply</td><td>100%</td></tr> </tbody> </table>	Code	Pro-rata share of overall investment (%)	D.35 Electricity, gas, steam and air conditioning supply	100%
Code	Pro-rata share of overall investment (%)				
D.35 Electricity, gas, steam and air conditioning supply	100%				

⁴ Revision 2 classification system of economic activities established by Regulation (EC) No 1893/2006 of the European Parliament and of the Council

3. Authority responsible for the implementation of the Modernisation Fund	
3.1. Name	State Environmental Fund of the Czech Republic
3.2. Address	Olbrachtova 2006/9, 140 00 Praha 4, Czech Republic
3.3. Website	https://www.sfzp.cz/en/
3.4. Main contact:	
Name	Ivo Marcin
Position in the Organisation	Director of the Department of the State Fund Strategy and International Cooperation
Email	ivo.marcin@sfzp.cz
Telephone Number	+420 267 994 148
Mobile Number (optional)	+420 736 756 015

Please provide enough detail in this Form to enable the EIB to clearly understand what the project will do, how the project will be delivered, the impact it will have and how it will meet the requirements set out in the Directive 2003/87/EC and Implementing Regulation (EU) 2020/1001.

Please be as concise as possible. Please note any supplementary information you provide will not be reviewed⁵.

⁵ Except information explicitly requested by this Proposal Form, or additionally by the EIB during the investment appraisal process.

Summary table about the scheme	
Scheme from the Support Programme:	Renewable Energy Sources (RES+)
Support sub-area	Priority projects defined in Article 5.2.2 of the Programme
Supported activities	Installation of new renewable energy sources – photovoltaic power plants with installed power output up to 1 MWp – and elements of active energy management
Type of support	Ex-post Grants, unit price not exceeding the aid intensity according to GBER
Maximum amount of support for a project	15,000,000 EUR
Basic outputs expected (based on the project intentions registration) <ul style="list-style-type: none"> • <i>no. of projects supported:</i> • <i>total amount of subsidy:</i> • <i>total investment costs:</i> • <i>total RES capacity installed:</i> • <i>electricity storage capacity:</i> • <i>total CO₂ emission reduction:</i> • <i>total energy savings:</i> • <i>no. of jobs created:</i> 	1154 192,000,000 EUR 549 mEUR w/o VAT and 664 mEUR incl. VAT 452.2 MW (23.9% of the NECP ⁶ target) 124.5 MWh 389 kt CO _{2eq} (0.9% of the NECP target) 1,628 TJ (1.4% of the NECP target) 1,757 in direct employment

⁶ National Energy and Climate Plan

4. General description of the investment (Annex I, points 1.1, 1.2 and 1.10 of the IR⁷)

4.1. Please briefly describe what investment objectives are, including the impact it will have in the area and/or on project participants. Describe the short, medium and long-term results/impacts that the investment will deliver and how this will be measured.

Please link to SMART (specific, measurable, achievable and time-constrained) objectives. Please demonstrate how the investment will contribute to 2030 climate and energy framework objectives of the Member State and the long-term objectives as expressed in the Paris Agreement as required by the BMS National Energy and Climate Plans (NECP). Please also elaborate as to whether the proposal supports the national Just Transition Plan (JTP) and/or national RRP (Recovery and Resilience Plans).

Please include information on: (a) the expected energy saved in MWh (for a typical full year of the investment operation); (b) the greenhouse gas emissions to be saved in equivalent tCO₂ (for a typical full year of the investment operation); (c) the additional renewable energy capacity installed, if applicable;

The objective is to promote investments in renewable energy sources (RES) by providing investment subsidies for new installed capacity. This particular scheme focuses on projects of photovoltaic power plants with installed capacity up to 1 MWe. For sake of grid stability, energy storage technologies can be supported as a part of the project.

The short-term goal of this scheme is supporting the emerging interest in renewable energy among small investors – businesses (with focus elsewhere than energy production), individuals, and municipalities. This is a sector with large potential for PV installation, which is slowly getting rid of the idea that PV is too expensive. Having a scheme for supporting a large number of small projects will start a wave of project intentions and interest in renewable technology. Partially this goal was achieved as the State Environmental Fund (SEF) received thousands of project intentions during the project intentions registration. The same effect can be expected as was seen after introduction of the programme Greenlight for Savings in 2009 financed from the AAU trading revenues, after which the interest in energy savings soared.

The medium-term goal is to provide support for RES projects throughout the period 2021-2030 so that they contribute to achievement of NECP targets – reduction of GHG emissions by 30% compared to 2005 levels and increase of share of renewable energy to 22% of the gross energy consumption. The NECP target for new PVE capacity is 2088 MWp. These targets are likely to be refined due to increased EU climate ambition and expected „Fit for 55“ package, but this scheme should exceed the current NECP targets. It will also put the Czech Republic on track towards the Paris Agreement goal of climate neutrality by 2050, because the new RES capacity will represent an economic pressure in the merit order in relation to fossil fuels-fired sources that will not have been replaced yet. According to the ICF Study, this scheme (together with a scheme for large-scale PV and other RES projects) should result in new RES capacity of 3074 MWp and production of 17,5 TWh of renewable energy by 2030, saving 6,5 mil. t CO₂ annually. The reduction of GHG emissions should be clearly visible from the EU ETS reporting in the EU Transaction Log. Even the ICF estimates can be considered as conservative, having on mind the results from the project intentions registration.

⁷ IR – Implementing Regulation (EU) 2020/1001

The long-term goal is to replace all coal-fired power plants as the sum of small PV installations will gradually push the carbon-intensive power plants from the merit order. The reduction of installations with coal-fired units, total of coal-based source streams as well as amount of coal combusted in EU ETS installations will be seen in the reporting pursuant to Art. 21 of the Emission Trading Directive 2003/87/EC.

In line with the national and European strategic goals discussed above, these measures in priority projects are supported:

Installations of new renewable energy sources (photovoltaic power plants with installed power output up to 1 MWp) and elements of active energy management (see more details in section 4.5); they translate into the following envisaged contributions:

Renewable energy capacity installed: **452.2 MW** (23.9% of the NECP target)

Total CO₂ emission reductions: **389 kt CO_{2eq}** (0.9% of the NECP target)

Electricity storage capacity: **124.5 MWh**

Energy saved per support: **8.5 TJ/mEUR**

Emissions abated per support: **2.0 ktCO₂/mEUR**

Direct employment created: **1,757 additional jobs**

Indirect/induced employment created: **3,704 FTE person-years**

Total eligible costs: **516 mEUR**

Total investment costs: **549 mEUR**

(see also sections 4.7 and 5.2)

The amounts of electricity produced from PV power plants is calculated in accordance with the ČSN EN 15316-4-3 standard based on the average values of solar irradiance in the usual conditions of the Czech Republic and the minimum required efficiency of photovoltaic cells (for more details see programme document, Annex A). Reduction of greenhouse gases emissions is calculated with a presumption that the electricity generated from renewable sources replaces the production of fossil fuels-fired power plants.

Methodology used for calculation of potential reduction of CO₂ emissions proceeds from Decree 140/2021 of March 2021 on Energy Audit which is grounded in Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC. The emission factor for electricity, used for calculation of the scheme contribution to the national climate goal, is 0.860 t CO₂/MWh.

In the preliminary call for project intentions, a total of 8,224 eligible project intentions were submitted for the whole RES+ programme, of which there are 5,599 projects for the present scheme with a total cost amounting to 2,662 mEUR and envisaged support from the Modernization Fund of 932 mEUR.

The proposed scheme is closely coordinated with preparations of the national Just Transition Plan (JTP), managed in the framework of the Operational programme Just Transition (financed from the Just Transition Fund) by the Ministry of the Environment of the Czech Republic in cooperation with SEF as an operator and projects administrator. The Czech JTP focuses on three coal regions (NUTS 3 Karlovarský, Moravskoslezský and Ústecký regions). Coal regions have **spacious areas affected by mining** (more than 70% of these areas are located in coal regions). The most affected is the Ústecký region with large surface lignite mines. PV powerplants supported by this scheme could be a good solution – it will help to replace energy sources, recover land, and it will also create new jobs. Both Modernisation fund and Just Transition Fund will provide financial support to this objective, and clear demarcation is set:

- **Modernisation fund** focuses on reducing greenhouse gases, and it supports new renewable energy sources (such as this scheme);

- **Just Transition Fund** addresses the impacts of the transition – it will support companies creating green jobs or employees coming from the coal industry, and it will help to recover land needed for new investments into renewable sources.

In the whole of the Czech Republic – as can be seen in the preliminary call for project intentions – photovoltaic power plants have a dominant position in renewable energy sources considered by potential applicants and coal regions thus will get a large part of the positive economic effect generated by this scheme; this can help the economy and transition significantly.

The coordination with the **national RRP** is also on a high level. The body responsible for RRP is the Ministry of Industry and Trade. Its representatives are members of a committee and all working groups related to Modernisation fund.

One of the objectives of the RRP is to achieve a **target share for renewable energy sources** according to the NECP (22% in 2030). The RRP strongly focuses on small installations of RES connected to buildings (in the residential, commercial, and public sectors), and this scheme will support similar types of installations, thus complementing the scheme for PV powerplants with installed power output above 1 MWp supporting larger installations. Both instruments will thus contribute to the abovementioned objective.

4.2. Please specify targeted beneficiaries⁸

Modernisation fund Operator / Intermediate Beneficiary

Modernisation fund operator / beneficiary is the State Environmental Fund of the Czech Republic (SEF). SEF is a special fund established by the law (Act no. 388/1991 Coll.). The primary purpose of the SEF is to support measures improving the quality of the environment. SEF will distribute grants from the scheme to final beneficiaries. SEF as the institution responsible for Modernisation fund implementation administers final beneficiary's applications, disburses grants to the final beneficiaries, and audits supported projects.

Financial capacity

SEF's budget is independent of the state budget and has its own income from environmental fees (around 60 mil. EUR per year⁹). Revenues from own economic activity (mainly interests from loans) are insignificant. SEF is also beneficiary of technical assistance to cover incurred costs of administration OP Environment and New Green Saving programme (around 13 mil. EUR per year). The total volume of the administered grants and loans was 572 mil. EUR in 2019. Modernisation fund resources are SEF's income according to the law (Act no. 383/2012 Coll. – national transposition of ETS directive). SEF's own resources will cover administrative costs of this scheme implementation.

Administrative capacity

SEF has more than 550 employees. There is a coordination unit of Modernisation and Innovation fund. Project administration is provided by the Section of Energy and Climate projects' implementation. Horizontal issues (i.e., legal services, financial control) are covered by the economic section and legal section for all programmes without specific allocation of employees. The organizational scheme of SEF can be downloaded from the Internet¹⁰. The SEF has long-term experience in the administration of support for environmental measures. In the present time, the SEF administers several financial programmes, e.g. Operational programme Environment (financed by Cohesion Fund and European Regional Development Fund), National programme Environment (financed from the budget of SEF); New Green Savings programme (funded by the

⁸ Beneficiary - an operator, body or firm, whether public or private, responsible for initiating and implementing operations.

⁹ 3-years average 2017-2019. More on <https://monitor.statnipokladna.cz/ucetni-jednotka/00020729/prehled> [partially in English]

¹⁰ See https://www.sfzp.cz/wp-content/uploads/2021/03/Organizacni_struktura_03-2021.pdf

State budget from emission allowances revenues); and Norway grants. Besides these programmes, the Fund will also administer support from the Just Transition Fund.

The Ministry of the Environment of the Czech Republic chairs the Czech Modernisation fund Committee as an advisory body to Minister. The Committee consists of representatives of the Ministry of Industry and Trade, Ministry of the Environment, Ministry of Finance and the SEF. It has a leading role in the implementation of the Modernisation fund in the Czech Republic.

The Platform of the Modernisation fund serves as an intermediary for communication with other stakeholders.

Detailed institutional arrangements and a description of the responsibilities and competencies of the implementing body is included in the General Programme Document for the Implementation of the Modernisation fund in the Czech Republic (CZ; see 4.3 and [web](#)) or the Programme Implementation Document (Annex A).

Final beneficiaries

Final beneficiaries can be any body based in the Czech Republic and holding a business licence in the energy sector pursuant to Act no. 458/2000 Coll (for more details and exceptions see Annex A). The scheme will support legal entities, municipalities, individuals as well as communities for renewable energy.

4.3. Please briefly demonstrate the need for the investment.

When the investment contributes to implementation of a territorial just transition plan, please provide information about the expected contribution of the investment to that plan.

In the Czech Republic, the share of RES in total energy consumption is still very low (around 16 %). More than 43 % of electricity is produced in coal and lignite-fired power plants, which emit app. 45 mil. t CO₂ per year. This represents two thirds of the Czech EU ETS sector.

The SEF launched a call for registration of project intentions at the end of 2020, collecting large database of projects which will be submitted once the call for proposals is launched. As can be seen from the analysis of project intentions registration (see Annex B), there is a strong appetite for PV projects among investors. However, the Czech Republic has no subsidy scheme for PV projects as specified above, unlike Member States like Germany or Poland, which are therefore more attractive for potential investors and “investment leakage” occurs. The RES+ programme and this particular scheme will represent a strong incentive for investments in renewables in the Czech Republic, which will enable making use of the potential for PV projects on brownfields and buildings.

The scheme contributes to implementation of territorial just transition plans (see also section 4.1).

Detailed information on the need for the investment is a part of a study (see Annex C) worked out by a team lead by ICF and supported by Enviro in the framework of a project “Supporting low-carbon transition of the Czech Republic by EU ETS Funding Mechanisms”. This project was supported by the Directorate General for Structural Reform Support (DG REFORM) through the Commission’s Structural Reform Support Service and aimed at developing an implementation framework for the Modernisation Fund in the Czech Republic. The specific project objectives were to:

1. Identify in which sectors the Modernisation Fund could be of most use based on a cross-sectoral gap assessment and an analysis of the energy system needs;
2. Propose national implementation modalities for the Modernisation Fund;

3. Assess the environmental, economic and financial leverage impact of the preferred implementation scenario.

In October 2020, the consortium delivered a final report comprising recommendations for the efficient use of the Modernization Fund as well as State Aid recommendations. Based on this report, in January 2021 the Czech Government approved a General Programme Document specifying 9 areas of support which are to be funded from the Modernization Fund as 9 programmes. One of these programmes named RES+ will provide grants for projects of new renewable sources of electricity. For sake of easier assessment by the EIB, the programme RES+ was split into several smaller programmes with homogenous projects and technology focus. This particular scheme aims at Photovoltaic Power Plants with capacity up to 1 MW.

Throughout the process of Modernisation fund implementation in the Czech Republic, the SEF and the Ministry of the Environment (MoE) have held consultations with stakeholders, other ministries and offices, including the Office for Protection of Competition, grid regulation bodies, business associations, NGOs and municipalities through a special consultative body – the Platform for the Modernization Fund. The Platform was created for the purpose of providing space for sharing the information about preparation of the Modernization fund and for consultations. Additionally, several bilateral meetings were held with members of the Platform.

Cooperation was also established with the Czech Technical University's expert department, which provided a specifically designed cost analysis together with methodology of calculation of counterfactual investment (Annex D).

The need for the investment and its adequacy is thus clearly demonstrated.

- 4.4. Please briefly explain what options were analysed to achieve investment objectives. Please explain why the chosen investment is the most cost effective in achieving investment objectives.

Four options were analysed:

1. **Operating subsidy** – this support tool is common for renewable power generation in the EU and worldwide. However, the Czech Republic has a very negative experience from year 2010 when the overly generous operating subsidy for PV power plants caused enormous public expenditures for decades and reputation of PV technology was harmed substantially. For this reason, operating subsidy was out of question and only investment grants were being considered.
2. **IRR targeting** – another option was a system of a fixed internal rate of return. The system would calculate the investment grant necessary for the IRR to reach a predetermined number. Every project would receive different rate of support but the IRR would be the same for all. This system would motivate project proponents to invest in more quality components and equipment rather than to look for the cheapest option. However, this approach would have to create a costs benchmark in order to determine the IRR – projects with lower costs would enjoy windfall profits while projects with higher costs would not materialize. Also, it would require a very detailed economic analysis of each project, including future revenues which are dependent on the future price of electricity and energy commodities. Such information being not easily and reliably available, this option was set aside.
3. **Competitive bidding scheme** – bidding is a form of auction, but in this case the investment grant would be auctioned, not the operating subsidy. The threshold for the auction is the amount of funds available. This option secures grants for the most cost-effective projects, but concerns were that the emphasis on the lowest costs would bring low quality projects and an enormous administrative burden would also diminish contribution of this approach given the number of projects to installed power output ratio. Consequently, this option was also set aside.

4. **Subsidy per unit** - typical projects were described and their costs per installed capacity unit (in EUR/kWp) were determined. Based on this, subsidy per unit was calculated so that the subsidy respects the GBER thresholds. Projects will be supported on a First Come, First Served basis. With this approach, the project proponents have clear view of what support they can receive from the Modernization Fund. Under this scheme, we expect large number of applicants with small projects – at this scale, competitive bidding is not effective as the economic conditions vary significantly among different projects. The Czech Technical University provided an analysis containing a methodology of eligibility verification and unit costs for various types of PV installations based on up-to-date technology and market scrutiny (See Annex D).

For the abovementioned reasons, the Subsidy per unit approach was chosen as a project selection method for the PV power plants up to 1 MWp. The criteria and unit prices are described in detail in the Programme Document for RES+, which is enclosed (Annex A).

4.5. Please briefly describe foreseen investments (technologies, main parameters, capacities, mass and energy balances, scope of works/supplies, related infrastructure).

Please provide evidence that the proposed technology/ies are mature (actual system proven in operational environment under comparable conditions and scale and with available references).

In this scheme, supported projects consist of installations of new photovoltaic power plants and elements of active energy management. Electricity storage systems can only be supported as part of a complex photovoltaic plant project installed directly at the source site. Only projects that meet the objectives of the program and the eligibility criteria can be supported.

General eligibility criteria of investments

The following eligibility criteria will be applied to all investments:

- a) The project implementation period must not exceed 3 years from the moment of issuing the Decision of the Minister of the Environment on the provision of funds from the State Environmental Fund of the Czech Republic;
- b) The project must be realized in the Czech Republic.
- c) The project must meet the general and specific conditions given by the relevant type of public support according to GBER.
- d) The applicant must not be a company in difficulty. (as per Commission Regulation (EU) No. 651/2014)
- e) The applicant must not have a conflict of interest. (as per Act No. 159/2006 Coll., on conflicts of interest, as subsequently amended, including the restrictions set out in Section 4c of the Act; if the applicant is a legal entity, its ownership structure and actual owners must be documented in the sense of Act No. 253/2008 Coll., on selected measures against legitimization of proceeds of crime and financing of terrorism, as subsequently amended.)

The project proponent is obliged to equip the electricity generation facility according to the conditions set out in the following documents:

- contract for connection to the transmission or distribution system,
- Commission Regulation (EU) 2016/631 of 14 April 2016 laying down a network code for requirements for the connection of generations to the electricity system,
- Rules for the Operation of the Transmission or Distribution System.

These requirements ensure that the project has been approved by local electricity distributor and grid operator, thus the technical connection is realistic.

Projects must not be purposely divided into separate applications in order to circumvent the thresholds set by the program, i.e. in particular the GBER threshold. In the case of a project divided into several stages, these stages are considered as separate projects if the time between the next two stages of implementation is longer than 3 years.

Within one project it is possible to use only one place of implementation, which means one offtake or transfer point or a group of decentralized sources of RES, which form the so-called virtual power plant.

Photovoltaic power plants must not be built on the agricultural land areas (except for agrophotovoltaic projects) or land intended for the performance of the forest function.

Installation of PV plants on the areas of the agricultural land is possible only in the case of protection classes according to the certified soil ecological unit (BPEJ) III to V, provided that the use of the land for construction of PV is permitted by local administration authorities.

Only plants in which only the following photovoltaic modules, inverters and batteries will be installed can be supported:

- with independently verified parameters, which will be supported by copies of certificates issued by accredited certification bodies,
- with a manufacturer-guaranteed service life of at least 20 years for modules and 10 years for inverters and batteries.

Minimum efficiency of modules under standard test conditions (STC):

- 19.0% for monofacial modules made of monocrystalline silicon,
- 18.0% for monofacial modules made of multicrystalline silicon,
- 19.0% for bifacial modules at 0% bifacial gain,
- 12.0% for thin film modules,
- not specified for special products and applications (e.g.: agrophotovoltaics with sunshare technology, special photovoltaic coverings, technology designed for flat roofs with low load capacity).

Minimum inverter efficiency must be 97.0% (Euro efficiency).

Aid for the construction of an electricity storage system may only be granted for systems with a capacity of:

- min. 20% of the theoretical hourly production at the installed peak power of the PV plant (hereinafter also $THP_{from P_{inst}}$),
- max. equal to $THP_{from P_{inst}}$.

Lead-based, NiCd, or NiMH-based technologies will not be supported.

Power plants must be equipped with transformers (inverters) with continuous or discrete controllability of the power supplied to the electrical system, enabling the management of power output.

More details on these requirements can be found in the Programme Implementation Document (Annex A).

Within the implemented projects, mandatory indicators setting minimum requirements for project contributions as well as so-called monitored indicators will be monitored and evaluated by SEF.

Mandatory indicators will be part of the grant application and will be subject to a contractual obligation; they will help to monitor and measure the achievement of specified outputs of the project itself. Fulfilment of mandatory indicators is under the direct control of the project by SEF and must be achieved in a specified time frame set down in advance. If the project target values of relevant mandatory indicators would not be fulfilled, a correction of up to 100% (depending on the degree of non-fulfilment) would be applied.