

PL04 MONITORING REPORT

PART A

Programme monitored	PL04: SAVING ENERGY AND PROMOTING RENEWABLE ENERGY SOURCES
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Date of submission	August 17, 2017
Programme Operator	Narodowy Fundusz Ochrony Środowiska i Gospodarki Wodnej (National Fund for Environmental Protection and Water Management) - Ministry of Environment of Poland
Visited projects	<ul style="list-style-type: none"> • PL0007 - Reconstruction of boiler K1 in order to adapt to the combustion of biomass in Siekierki, Warsaw • PL0008 –Reduction of pollution emission by modernization of the dust extracting installation and the WR 5-022 boiler in PEC Sp. z o.o. • PL0071 – Improved energy efficiency in buildings of the Regional Hospital in Kolobrzeg • PL0092 – Construction of the Flue Gas Desulphurisation (FGD) System in Elektrociepłownia “KRAKOW” S.A • PL0095 – Construction of a SO2 reduction system in unit no. 5 at Turów Power Plant • PL0096 – Construction of a sulphur oxides reduction system in unit no. 6 at the Turów Power Plant • PL0097 – Construction of a system for reducing nitrogen oxide emissions from units 1-3 at the Turów Power Plant • PL0122 – Thermo modernization of objects: Public Junior High School No. 2, Public Schools Complex No. 4 and Primary School No. 6 in Swinoujście • PL0135 - Retrofitting of public buildings and educational institutions in the Korfantów Commune

Monitoring carried out (period)	May – July 2017
Background to Programme/ Reason for the Monitoring	<p>The main purpose for this monitoring assignment is to:</p> <ul style="list-style-type: none"> • Document and assess the achievement of programme results (outputs and outcomes), including those not covered by the indicators in the Programme Agreement. • Identify lessons learned, including from projects cancelled or withdrawn, that can contribute to better planning and implementation of similar future interventions. • Identify barriers to the involvement of private sector stakeholders (including industries, SME's, households).

PART B

Content

1. Description of how the monitoring was conducted	4
2. Findings	7
2.1 Introduction – Overview of the programme implementation	7
2.2 Key questions	10
2.3. Other findings.....	29
2.3.1. General remarks to the support of some large industrial projects.....	29
2.3.2. Sources of emissions in Poland.....	29
2.3.3. Renewable energy outlook	34
2.3.4 GHG emissions calculation for Outcome 4 projects	35
3. Stakeholders’ comments	36
4. Conclusions and recommendations.....	38
5. List of annexes	44
Annex 1: Overview of the projects investigated.....	45
Annex 2: Summary of the site visits.....	52
Annex 3: Summary of the questionnaire survey	69
Annex 4: Summary of the phone interviews	75
Annex 5: Summary of project reviews.....	77

1. Description of how the monitoring was conducted

The **Monitoring Team (MT)** consisted of:

- Petr Kořán – leader of the Monitoring Team
- Jakub Heller – member of the Monitoring Team, sectoral expert
- Karol Bajer – sectoral and local expert

The monitoring was elaborated in the **following stages**:

- **Initial stage** involving clarification of the service purpose and scope with the FMO, contacting the Programme Operator (PO), the National Focal Point (NFP) and requesting documents needed for the service
- **Performing the monitoring tasks:**
 - Study of programme documentation.
 - Organizing the meeting with the NFP and the PO (May 30th 2017, Warsaw).
 - Organizing site visits of projects: PL0007, PL0008, PL0071, PL0092, PL0095, PL0096, PL0097, PL0122 and PL0135; main findings are summarized in Annex 2.
 - Developing and performing online survey (using Survey Monkey online tool) for public and private respondents; questions of the survey and main findings are attached as Annex 3.
 - Interviewing selected project promoters by phone; main findings are summarized in Annex 4.
 - Reviewing project documentation of selected projects; main findings are summarized in Annex 5.
 - The list of investigated projects and the assessment methods used for each project are summarized in Annex 1.
- **Analytical stage** and drafting the monitoring report.

Programme documents used:

- Annual Programme Reports (APR) 2013-2016
- Programme Agreement and its annexes
- Report “Poland: Rapid Assessment of Energy Efficiency and Renewable Energy” (2016)
- Monitoring Report of PL04 programme (2014)
- Programme proposal and annexes
- PL04 Appraisal Report
- Strategic Report on the implementation of the Financial Mechanism of the European Economic Area and the Norwegian Financial Mechanism 2009-2014 in Poland in 2016
- Calls documentation

Other relevant documents used:

- Documentation of selected implemented or withdrawn projects:
 - Application form
 - Latest report (final report if available)
 - Any documentation relevant to withdrawal of withdrawn projects
- Documentation of selected rejected projects:
 - Application form
 - Evaluation report
- Intermediate results (online questionnaire results) of the evaluation for the Ministry of Development made by the consortium of companies IDEA Instytut Sp. z o.o. and Policy & Action Group (PAG) Uniconsult Sp. z o.o.
- Corresponding EU legislation and reference documents, especially:
 - Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty (Text with EEA relevance)
 - DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast) (Text with EEA relevance)
 - Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (Text with EEA relevance)
 - Reference Document on Best Available Techniques for Energy Efficiency
 - Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

Limitations

For the assessment of the programme and after planning of the tasks with the FMO, the MT approached the PO and the NFP with request for programme and project documentation. For the selected projects the MT requested the following information:

- Project inventory with identification of project number, title, location, type of applicant, status (ongoing, completed, withdrawn, rejected), call, budget and contact
- For selected ongoing, withdrawn or completed projects: energy audit, project application, evaluation form, progress reports, final report, any documentation explaining reasons for withdrawn projects
- For selected rejected projects, the requested documentation included the application form and evaluation report.

Some of the documents listed above exist only in paper form, which is in some cases very extensive (e.g. energy audits), therefore the PO asked the MT to reduce the documentation and extend the time needed for document transfer. Documentation that was made available

to the MT during June included project application for all selected projects, latest available report for completed, ongoing or withdrawn projects and evaluation report for rejected projects. Energy audits therefore could only be acquired from projects visited and as a sample from the PO. The delay in providing the documentation led to extension of the draft report deadline by approximately 1 month (approved by the FMO).

Another limiting factor was the fact that many projects were not finished (i.e. completed and reported) during the implementation of the monitoring task. At the time of transfer of project data only about 30 projects were completed, therefore it was not possible to assess achievement of the programme targets quantitatively. This can only be done after completion of all projects and after acquiring control energy audits after 1 year (and later after 5 years) of operation for some projects, though calculated (and reported) values are reliable enough to assess whether the overall targets at programme level have been reached.

2. Findings

Summary information about the programme implementation is provided in section 2.1 in order to clarify numbers of projects funded under different outcomes and calls. The rest of section 2 is structured according to the key questions raised by the FMO in the Terms of Reference for this service.

2.1 Introduction – Overview of the programme implementation

The PL04 programme has been implemented through 5 programme outcomes:

- Outcome 1: Improved energy efficiency in buildings
- Outcome 2: Increased awareness of and education in energy efficiency,
- Outcome 3: Increased renewable energy production
- Outcome 4: Reduced production of waste and reduced emissions to air, water and ground
- Outcome 5: Improved energy efficiency in buildings

Outcomes 1 - 3 are funded by the EEA grants and Outcomes 4 - 5 by the Norwegian grants. The outcomes have been implemented as follows:

Outcome 1 (Building programme)

The Building programme has been implemented through **95 projects** realized by public authorities or private entities providing public services (public-owned companies) that were selected through 2 open calls (in May-July 2013 and July – September 2014).

Outcome 2 (Awareness campaign)

The awareness raising campaign (**1 project**) was implemented by the PO. The corresponding project is out of focus of this monitoring, but it was briefly reviewed with positive results (the project exceeded the planned impacts). On the other hand, several of the interviewed project promoters mentioned that they would prefer using the funds spent for general awareness raising rather than for improvement of information assistance provided by the PO to the project promoters. Some of the interviewed persons also expressed their reservation to the very broad range of target groups of the awareness campaign. According to them, it would be more efficient to address directly potential applicants rather than implementing a very generic campaign with hardly measurable impacts.

In the opinion of the MT, continuation of support to awareness raising activities in the new programme is still relevant mainly with respect to quite limited activities in this field in Poland. It would be recommendable to focus the campaign on renewable energy sources and on good practice examples of small-scale installations in SMEs, public buildings and households.

Outcome 3 (RES programme)

Support of renewable energy projects has been implemented through **5 projects** selected within 2 open calls for public and private (public owned) entities. All of the projects to be completed come from the original first call; no project from the second call has been brought to completion.

Outcome 4 (Industrial programme)

The Industrial programme represents extension of the PL04 programme after shifting funds from other activities. The allocation has been used for preselected industrial projects that had been positively evaluated under the Operational Programme Infrastructure and Environment (OPIE - Structural Funds) but available funds in the OPIE did not allow funding them. 28 projects were offered funding from PL04, out of which **23 were contracted**. Additionally, two calls were organized for additional industry projects. Through the calls (February-April 2014 and July-September 2015) only **1 additional project** was selected and funded.

Outcome 5 (Extension of building and RES programmes)

54 projects funded under Outcome 1 and 3 have been extended (additional grant awarded to them based on extended activities implemented in the projects) up to date, **out of which 24 projects** have been extended using NFM grants. The 24 extended projects represent the Outcome 5. These are not additional projects but extensions of the projects already previously selected and funded under Outcomes 1 and 3.

The following table provides overview of applications, approved projects and withdrawals in all calls of Outcomes 1, 3, 4 and 5.

Outcome 1 - Improved energy efficiency in buildings				
Outcome 3 - Increased renewable energy production				
Outcome 5 - Improved energy efficiency in buildings - extension				
CALL1				
May-July 2013				
	submitted	approved	Resigned or cancelled	completed or to be completed
Outcome 1	211	79	13	66
Outcome 3	31	8	3	5
Total	242	87	16	71
CALL2				
July - September 2014				
	submitted	approved	resigned	completed or to be completed
Outcome 1	79	37	8	29
Outcome 3	5	1	1	0
Total	84	38	9	29
EXTENSION				
2015				
	submitted	approved	resigned	completed or to be completed
Outcome 1	55	52	11	41
Outcome 3	3	2	1	1
out of which Outcome 5		24		24
Total	58	54	12	42

Outcome 4 - Reduced production of waste...(industrial projects)				
PRE-DEFINED				
	preselected	approved	resigned	completed or to be completed
Outcome 4	28	23	0	23
CALL 1 Industry				
February - April 2014				
	submitted	approved	resigned	completed or to be completed
Outcome 4	4	3	2	1
CALL 2 Industry				
July - September 2015				
	submitted	approved	resigned	completed or to be completed
Outcome 4	2	0	0	0

2.2 Key questions

Programme design and relevance

- 1) *How many of the applications received under outcomes 1, 3 and 5 came from private entities providing public services? If any of these applicants were rejected, what were the reasons?*

Outcome 5 wasn't implemented as an open call for additional projects but as an offer for extension presented to the projects already funded under Outcome 1 and 3 in two previous calls (in 2013 and 2014). This was mainly due to unexploited funds left in the programme and short remaining time till the end of the eligibility period (it would have not been feasible to prepare and implement new projects). The table below summarizes number of applications under calls for Outcomes 1 (buildings) and 3 (renewables) in 2013 and 2014 according to the type of applicant.

	Call 2013	Call 2014
Outcome 1: Improved energy efficiency in buildings – public applicants	180	65
Outcome 1: Improved energy efficiency in buildings – private applicants	31	14
Outcome 3: Increased renewable energy production – public applicants	25	4
Outcome 3: Increased renewable energy production – private applicants	6	1
Total number of applications	242	84

The eligibility criteria allowing participation of private entities was defined by the call documentation as follows:

- 1. Improvement of the energy efficiency of buildings, including thermo-modernization of buildings used for: public administration, education, health, social care, higher education, science, tourism and sport.*
- 2. Modernization or replacement of existing energy sources (together with the replacement or reconstruction of outdated local networks) supplying public buildings referred to in point 1 with modern, energy efficient and ecological sources of heat or electricity with a total rated power of up to 5 MW, including: renewable sources or combined heat and power (cogeneration / trigeneration) sources.*

The total number of project applications submitted by private bodies providing public services in the two calls for Outcomes 1 and 3 was 52, out of which 16 were funded (according to the project inventory provided by the PO). That means that 36 applications were rejected. The evaluation procedure included formal check and technical assessment by two experts. Projects that passed the formal check had to score over the minimum point threshold of 55 out of maximum of 100 points in the technical assessment stage. Projects that haven't reached the threshold were rejected.

There were problems with initial setting of selection procedures within the 2013 call as described in the Monitoring Report elaborated by INBAS Company in 2014. It resulted in high number of projects rejected for formal reasons and consequently into high number of appeals (73). There were also 27 appeals against the result of technical evaluation. The majority of appeals was assessed positively and therefore the selection procedure had to be repeated.

As stated in the Monitoring Report 2014 and verified during the current interviews, the original formal eligibility criteria as well as the rules for Ecological Effectiveness Audit were too complicated for many applicants resulting in the high number of rejected applications and the appeals. During current monitoring, the MT requested documentation of 7 rejected projects (4 submitted by private entities, 3 by public bodies) in order to check the reasons for rejection.

The reasons for rejection are summarized in Annex 5. **Based on the reviews and interviews, it can be stated that:**

- Eligibility criteria were not clearly defined in the calls texts resulting in misunderstanding of some applicants and rejection of their applications in formal check stage. It relates especially to relatively vague definition of “private body providing public services”. The “private body providing public services” (possibly co-owned by the municipality) can be for example hospital, cultural, educational or other publicly beneficial organization. The term does not relate to any specific legal entity but has been only defined in the call text. The definition was quite narrow (allowed only specific types of services as eligible) and was apparently misinterpreted by some unsuccessful applicants.
- The Ecological Effectiveness audit requirement was too complicated for many applicants. They often struggled not only with the audit but even with the application form. Therefore they had to hire external companies helping them with the form and the audit. The methodology of the audit was developed by the PO specifically for PL04. The PL04 application annexes included a guideline for preparing the ecological effectiveness audit. The guideline enabled consultancies to offer a unique service – preparation of PL04 ecological effectiveness audits. The audit is methodologically correct, but it should be applied to all projects in the future. Pre-defined projects didn't have to use it in the current programme, which caused the unavailability of CO₂ data in many of them. It is a hybrid of a standard energy effectiveness audit (defined in Polish law, but still often causing problems with interpretation of calculating methods), CO₂ reduction calculations and economic effectiveness assessment. The amount of input data and required calculations caused troubles to many applicants despite the support provided by professional energy auditors. It resulted in many failures in the formal check stage.
- The reviewed projects that failed in the technical assessment stage did not reach the minimum point threshold. The MT reviewed the technical criteria and guidelines for assigning points in each criterion. The evaluation and scoring procedure was very complicated in the 1st call resulting in many appeals against evaluation results. This was described in the previous monitoring report in 2014. The procedure was then changed by the PO. Since the scales for assigning points are based on quantified indicators excluding influence of expert opinion on the scores, the scoring was rather mechanical and the results for the two evaluations of each of the two selected projects were consequently exactly the same. This puts usefulness of hiring an external company for technical evaluation and performing double assessment with the same expectable results under question. Internal employees of the PO could do evaluation based on hard data and fixed scales.
- There were no indications of unfair evaluation detected by the MT neither during the

review of rejected applications nor during interviews with the applicants, though it has to be reminded that the MT did not have the opportunity to check the full project application with all annexes (existing only in paper form).

2) Based on interviews and the survey, what elements of the call process seemed to have discouraged private sector applicants to apply for funding under the Norway and EEA Grants? Please provide examples to explain.

As summarized in section 2.1, there were just 6 applications submitted within 2 industrial calls under Outcome 4, out of which only 1 project has been implemented. On the other hand, the interest of private bodies providing public services under Outcomes 1 and 3 (and the extension under Outcome 5) was good.

Based on the reviews, interviews and site visits as well as the meeting with the PO/NFP, there are various reasons contributing in different degree to the disinterest of private bodies to apply for funding. These are summarized as follows:

- a) Private enterprises were not eligible applicants under Outcome 1 and 3 unless they provided relatively limited types of public services as explained above. Despite of this, the interest of private bodies under those Outcomes was satisfactory, though extending the range of public services and their more precise definition would be commendable.
- b) Each applicant could only submit 1 proposal in the calls for Outcomes 1 and 3. Some of the interviewed private applicants mentioned that they would be interested in submitting more applications. This requirement is also not consistent with the approach applied for pre-defined projects and industrial calls, where some of the promoters implemented up to 4 projects (EDF Company, PGE Company).
- c) There was very high requirement of reduction of CO₂ emissions by at least 100 000 t/year in 2014 call (lowered to 20 000 t/y in 2015 call) for Outcome 4. This requirement basically disqualified many small and medium sized enterprises just due to the fact that they do not produce such enormous amounts of CO₂.
- d) At the same time, the large projects meeting the requirement are usually financially demanding, which consequently causes very low grant rate because of the maximum support of 20M PLN that can be awarded to an enterprise¹. In case of some of the reviewed or visited projects (e.g. PL0095, PL0096, PL0092), this resulted in an effective grant rate of as low as 10 or even 8%. It is then less attractive for the companies to accept high administrative burden of the grant implementation while getting very small part of their investment covered by the grant.

¹ The cap is not required by the legislation, but by the programme conditions coming from this limit in the Operational Programme Infrastructure and Environment (SF). The legislation defines a maximum grant rate only. EU legislation uses the following formula for maximum state aid for large projects (within regional aid):
 Maximum aid amount = $R \times (50 + 0,50 \times B + 0,34 \times C)$ where: R is the maximum aid intensity applicable in the area concerned, excluding the increased aid intensity for SMEs. B is the part of eligible costs between EUR 50 million and EUR 100 million. C is the part of eligible costs above EUR 100 million;

- e) There is a limited remaining absorption capacity among large enterprises in Poland in the area of energy effectiveness that could be supported from the programme given the legislative situation and the conditions of the programme. The interviews revealed that large companies usually plan very large investments (e.g. supercritical coal burning installation by PGE company with estimated costs of 4-5 billion PLN), where the cap of 20M PLN would mean grant rate under 1% of the investment costs. Many relevant measures in energy sector have been already implemented.
- f) The Outcome 4 objective was “reducing greenhouse gas emissions and air pollution and increase the share of renewable energy in the overall energy balance”, which would allow also other projects than just those meeting the requirement for CO₂ emission reductions. **There is an absorption capacity in Poland in area of reduction of the air pollution, but the requirement for CO₂ emissions reduction may have prevented the investors to apply.**
- g) There was very short time available for preparation of project applications under the Outcome 4 calls:
- 2014 Call*
Announcement of the call – 31.01.2014
Start of submission of proposals – 3.02.2014
End of submission of proposals – 7.04.2014
- 2015 Call*
Announcement of the call – 09.07.2015
Start of submission of proposals – 10.07.2015
End of submission of proposals – 14.09.2015
- As obvious from the timing of the calls, there was almost no time between announcement of the calls and launching submission of proposals. Then there were only 2 months for preparation of the application including all annexes and permits that are usually required for such investments. At the same time, the calls required only submission of investment projects where the works hadn't been commenced yet at the time of submission. This prevented already running projects to apply and distracted applicants perceiving the high time risk of completion before the final eligibility date.
- h) There were large funds available for the same type of industrial projects in the Operational Programme Infrastructure (operated by the PO of PL04) within Polish Structural Funds. Since the conditions are comparable with the PL04 programme, it can be assumed that some enterprises prefer to use the Structural Funds because they are more familiar with the programme. There was high interest of applicants in the past calls of the Operational Programme, which was used to utilize major part of allocation allocated to Outcome 4 of PL04 by shifting reserve projects of the Operational Programme as pre-defined projects in PL04.
- i) While the MT did not perform detailed comparison of administrative requirements and submission procedures used for other programmes in Poland, several interviewed

and surveyed private bodies mentioned that PL04 requirements were more demanding than usual in other grant schemes. It relates for example to absence of electronic submission system or the need for submission of paper form of the application and its annexes. It has to be noted in this context that the call documentation of PL04 calls contains about 20 different documents and guidelines, which is excessive and confusing.

3) *What are the biggest barriers to attract projects, promoters and support from the private sector? What are the likely funding gaps currently facing potential project promoters seeking to invest in renewable energy and energy efficiency?*

The barriers related to the programme setup and conditions are explained in the previous point. Other barriers identified by the MT include:

a) Legislative requirements

General Block Exemption Regulation (GBER) 2014-2020 requires energy efficient district heating to be eligible for funding from public resources. Energy efficient district heating is defined by EC Directive 2012/27/EU on energy efficiency (implemented in the Polish legislation) as follows:

‘efficient district heating and cooling’ means a district heating or cooling system using at least 50 % renewable energy, 50 % waste heat, 75 % cogenerated heat or 50 % of a combination of such energy and heat;

This requirement is transposed into Polish law. No stricter conditions are applied.

According to information acquired from the interviewed project promoters (e.g. PL0008, PL0092), more than 90% of district heating companies in Poland do not comply with the energy efficiency requirement set by the regulation. It would exclude them from applying for modernization projects in the future grant period.

Major part of the energy sector (not only the district heating companies) in Poland still relies on fossil fuels (especially coal). In November 2009, Poland adopted the National Energy Policy up to 2030. The government has committed itself to continuing with domestic anthracite and lignite as primary fuels for electricity generation, arguing that it is cheap and guarantees national energy independence and security. Recent General Block Exemption Regulation explicitly excludes activities of the coal sector as well as the related energy generation, distribution and infrastructure from the regional aid. Horizontal aid allows the sector to be funded in a limited range of activities:

- Renewable energy sources (only in the form of loans)
- Energy efficiency projects
- Construction and modernization of heating networks.

b) Financial barriers

Several project promoters mentioned the fact that their preferred form of grant was non-returnable support rather than loans that were used as additional form of support of PL04 projects (funded from the national budget). With regard to information from large companies implementing PL04 projects, they could possibly get the same or even better interest rates on loans taken on commercial bank market than the subsidized loan.

Low pre-financing was mentioned as a barrier by several project promoters, especially by private bodies providing public services, i.e. those under Outcome 1 and 3. Those bodies don't dispose of sufficient own resources enabling them to cover the project costs and they are thus forced to take loans that decrease effective grant rate received.

c) Eligibility barriers

As outlined in the answer to the previous question, the MT believes that there is no reason to create barriers for small and medium sized projects (i.e. those not meeting the requirement for minimum amount of avoided CO₂ emissions). There is a large potential among Polish SMEs (e.g. food industry, manufacturing, chemical industry and other fast-growing sectors) for energy efficiency and RES measures (e.g. decreasing energy demand in production, generation of renewable energy for own consumption or even increasing energy efficiency of private residential buildings). Current conditions of the industry calls resulted in situation when the public support was awarded mainly to very large companies that would be able to implement the projects even without the grant (low motivation effect of the support). Moreover, several of the industries explained that they had been obliged to implement the supported projects in order to comply with legislative requirements (e.g. maximum emissions of nitrogen and sulphur oxides).

d) General policy barriers

Relatively uncertain support of the political representation of Poland to renewable energy sources still persists. Current officials emphasize coal as the main source of energy for the future, which represents a barrier for faster development of RES installations.

On the other hand there is a potential for innovation and significant reduction of emissions even within the coal industry involving advanced technologies for cleaner and more efficient energy production from coal like e.g. (underground) coal gasification or supercritical and ultra-supercritical coal firing, though these technologies are still not brought to the technology readiness level needed for hitting the market. More about the policy barriers is given in section 2.3.3.

Funding gaps identified

Public sector:

Prevailing part of the consulted public project promoters confirmed still **very high absorption capacity for continuation of the building programme**. For example, the project promoter of PL0071 stated that there were still about 30 % of hospitals in the West Pomeranian Voivodship in need of energy efficiency measures. The PO also confirmed the demand for

continuation of thermo-modernization of public buildings in the future programme. Improving the energy efficiency of public buildings was the most frequent funding gap indicated by respondents of the questionnaire survey as presented below (the question was open):

What are the funding gaps for public applicants? ²	
Answer	Frequency of occurrence
Improving the energy efficiency of public buildings	10
RES installations (other than PV)	9
Photovoltaics	8
Residential (private) buildings thermo-modernization	5
Street lighting modernization	3
Small to medium size cogeneration installations	2

Other ideas for future funding priorities as mentioned in the interviews with the public authorities can be summarized as follows:

- Photovoltaic installations for production of electricity for own consumption
- Other RES installations
- Residential buildings thermo-modernization
- Increasing efficiency of public lighting systems
- Energy efficiency of sport facilities
- Exchange of boilers in private (family) houses
- Thermo-modernization of historical buildings
- Construction of new energy efficient public buildings
- Thermo-modernization of private family houses

As for expectable cost effectiveness of these priorities, just few of them (possibly RES installations and some thermo-modernization projects) can meet the limit set by the Blue Book (150 EUR per ton of CO₂ avoided) depending on actual setting of the project (size, current energy source and consumption, previous energy efficiency measures implemented, technical parameters of the new solution etc.).

The MT would like to point out that a regional or national scheme for exchange of old coal-burning stoves could have a major effect on air quality in many Polish villages and small towns suffering from absence of modern district heating facilities. A similar programme has been running in the Czech Republic for about 3 years with great success, extremely high interest of applicants (physical persons) and noticeable effects in reduced emissions of dust and harmful gases in the Czech countryside. The programme doesn't necessarily require changing the fuel (though change from coal to biomass is highly recommended and preferred), but it supports installation of new automatic stoves meeting emission class 3 or 4, which has enormous impact on emissions produced even from coal, which will probably

² Total of 54 answers collected. The question was open. The table includes 37 answers; the remaining answers were irrelevant or occurred just once.

remain the main energy source in Poland for decades.

Another funding gap identified by the MT is an increased support (higher grant rate and higher pre-financing) to small municipalities that are unable to secure co-financing of projects from own resources.

Private sector:

Funding gaps perceived by the private sector are generally those caused by legislative limitations as described in the previous point, i.e. mainly modernization of coal-based projects towards lower emissions of sulphur and nitrogen oxides and dust. This relates to power generation as well as to district heating companies interviewed. Another priority is modernization of energy generation and heating facilities to comply with BAT requirements for energy sector. Only one of the interviewed project promoters mentioned support of small scale cogeneration plants (up to 1MWe) as potentially interesting.

Large number of enterprises plan costly investment projects improving energy efficiency and reducing emissions from existing coal-based installations. The answers collected by the questionnaire survey and confirming this situation are given below (both questions were open).

What are the main funding gaps for private bodies? ³	
Answer	Frequency of occurrence
Reduce gas (other than just CO ₂) and dust emissions by improving efficiency of pollutant capture/removal	7
Support to coal projects in Poland	2
Large RES installations	2
Article 124 of EU No 651/2014 of 17.06.2014 (energy efficient district heating and cooling)	1
Small cogeneration units up to 1 MWe	1

What are your recommendations for the next programming period?⁴	
Answer	Frequency of occurrence
Increasing regional and horizontal aid for the professional energy sector (max grant, coal industry)	3
Simplify application and payment documentation	2
Possibility of avoiding art. 124 Commission Regulation (EU) No 651/2014 of 17.06.2014 - support to district heating and cooling systems not compliant with energy efficiency definition	1
Incentives for small cogeneration, financing of dust extraction and desulphurisation installations	1

³ Total of 15 answers collected. The question was open. Two answers were irrelevant.

⁴ Total of 12 answers were collected. The question was open. 1 answer was irrelevant.

More flexibility in financial support of different topics	1
To be implemented earlier than promised two years	1
The next period should be analogous forms of funding / public aid /	1
More opportunities for the private sector	1

However, this feedback is based on opinions of very limited group of project promoters, i.e. those who were able to get funded within the PLO4 programme – mostly large companies. In the opinion of the MT, **there is a large potential in smaller scale projects implemented by SMEs** ranging from support for elaboration of energy audits through thermo-modernization of buildings, adopting measures for energy efficient production and technologies, to RES utilization to recovery of heat and waste for energy purposes. This would be the recommendable direction for definition of future programme priorities rather than seeking for large projects, especially those that would be implemented even without the grant because of legislative requirements and very low actual grant rate that can be provided under the current state aid rules. Opening the programme and making the eligibility conditions flexible both from the standpoint of applicant status and character and scope of the activities would lead to more interest and possibly to variety of innovative project ideas generated by the enterprises.

4) What, if any, differences should there be in a strategy used to attract these two different target groups (public vs private) in applying for support for renewable energy and energy efficiency projects?

Public applicants

Attracting public applicants doesn't require any specific major action in the future because there is still high demand for grants in area of thermo-modernization of public buildings and RES installations as verified during the interviews, site visits and the survey. However, the complaints and comments of the public project promoters should be taken into account. The wishes and comments of public bodies have been sorted in the order of frequency of occurrence as follows:

- Simplification of application and management procedures, quicker payments
- Continuing the support as in the current period
- Higher advance payment needed, grants preferred over loans, higher grants
- More time needed for preparation of application
- Formal quality of call documentation has to be improved

The MT supports all of the project promoters' comments. The comment to formal quality of call documentation can be translated as necessity to condense the information provided in many different guidelines rather than improve the formal quality of specific documents.

Additionally, the MT would recommend opening the programme to **more types of public buildings including residential buildings or new energy efficient buildings** as well as to more types of applicants, especially **NGOs**.

The grant rate used for public projects is found generally adequate by the MT, though for small municipalities (under 2000 inhabitants) it could be **possibly increased up to 85-90%** of eligible costs because they have serious problems in assuring their own co-financing.

Private bodies

As explained in previous sections, the interest of large companies is limited due to state aid conditions (maximum grant and grant rate) and due to various legislative limitations including uncertain conditions for development of RES installations. Therefore attracting more interest from private bodies should be based on **more open conditions in terms of size of the projects** (while keeping the required ecological and economical effectiveness of the projects among the main selection criteria) encouraging smaller enterprises (SMEs) to apply with variety of possible activities (thermo-modernization of industrial buildings, energy efficiency in production, RES or even modernization private-owned residential buildings).

Another option recommended by the MT is to consider introduction of a **micro-grant scheme for residential and family houses for exchange of ineffective coal-burning stoves** for modern stoves complying with emission classes 3 or 4 and enabling both coal and biomass as fuel. Czech programme of Stove grants implemented by the State Environmental Fund of the Czech Republic can be used as inspiration. The programme makes it possible for physical persons to acquire up to approximately 5000 EUR for exchange of the stove with possible combination with other energy efficiency measures (change of windows and doors, thermos-insulation and reconstruction of heating system). Since the main target group are owners of family houses, the programme has to be very simple as for administrative requirements. Current call plans to support exchange of 35 000 old ineffective stoves. More information can be found at www.sfpz.cz/sekce/873/kotlikove-dotace/ in Czech language. Working translation of guidelines of the programme are attached as separate document (Annex 6) to this report.

All recommendations of public bodies to administrative and formal conditions of the programme as described above should also apply for private bodies. Special emphasis should be given on **enough time for preparation of project application** with all necessary permits (at least 4 months) as well as on **timely start of the programme** as such in order to prevent too short implementation period for supported projects.

Changing the starting cost eligibility date may also add to the attractiveness of the programme. It is a common practice in many grant schemes (e.g. Structural Funds, H2020 and others) that the starting eligibility date is prior to signing a grant agreement for individual projects, because it allows more flexibility to the applicant and prevents incompatibility of the grant scheme timing with various project activities (for example construction works colliding with winter season). This can lead to delays in the project implementation, to related necessity to amend the grant agreement and even to failure or withdrawal of the project if overall timing of the programme is as tight as it was in PLO4. A more flexible eligibility period therefore decreases time risk for the applicants and contributes to the overall attractiveness of the programme for potential applicants.

In general, a starting eligibility date is defined by the requirement for incentive (motivational) effect of state aid in accordance with COMMISSION REGULATION (EU) No 651/2014 as

follows: “Aid shall be considered to have an incentive effect if the beneficiary has submitted a written application for the aid to the Member State concerned before work on the project or activity starts.” The condition means that a project promoter can start realizing a project just after submitting an application for a grant, i.e. before possibly signing a grant agreement in case the project is selected for funding. Of course it means that the project promoter accepts the risk that the grant is not awarded, but it allows projects that would be implemented even without the state support (which was the case for many industrial projects funded under PL04) to be started already during the period of project evaluation and contracting.

Results, lessons learned and sustainability

5) What are the most significant programme outcomes achieved of those not covered by the programme agreement?

The PO provided the MT with an **inventory of indicators** as reported in June 2017 based on approved final reports and excluding the projects that will confirm achievement of target values after 1 year of operation. The file has been translated by the MT and is attached as Annex 6 to this report. It provides an overview both on main indicators as well as specific result indicators per project.

Currently confirmed achieved values of the main indicators do not meet the targets except of number of exchanged boilers, number of promotional campaigns and number of people reached by the campaigns (please see sheet “PL04 result”). However, based on the planned values of funded projects (sheet “PL04 plan”) the achievement of main targets seems assured though the table is subject of continuous updates. Final values achieved still have to be confirmed by major part of the project promoters after one year of operation of the projects by energy audits. Exceeding the planned targets was reported in many cases during the interviews and site visits performed by the MT. Especially the industrial projects can easily document actually achieved values of emissions and energy savings by online monitoring and regular controls performed by state environmental authorities. **In general, the programme is on track towards exceeding the target values of the main indicators** specified in the Programme Agreement.

Other outcomes of implemented projects as reported by Outcome 1, 3 and 5 project promoters based on the survey are summarized below. Interviews confirmed mainly the first four outcomes as presented in the following table.

Outcomes 1, 3 and 5	yes	rather yes
Improved visual appearance of the building	48	10
Improved air quality	43	17
Reduced emissions of other substances than CO ₂	37	18
Lower operational costs	25	25
Reduction of waste production	19	12
Increased awareness	17	33
Creation of jobs	1	5
Direct incomes	1	6

Apart from the **visual appearance** of the modernized buildings reported by the most of the public promoters, the main additional outcome is **reduction of emissions** of other substances than CO₂. This outcome is apparent, but it can't be supported by quantified values since related parameters can't be directly measured and it is not required from the project promoters, which applies also to savings of operational costs, reduction of waste production and other quantifiable outcomes. Increased awareness about energy efficiency or RES is also hardly measurable.

The additional outcomes for Outcome 4 (industrial projects) are similar to public ones except of improvement of visual appearance of the building as summarized in the survey table below and confirmed by additional promoters interviewed and visited.

Outcome 4 (industrial projects)	yes	rather yes
Improved visual appearance of the building	13	3
Improved air quality	10	3
Reduced emission of other substances than CO ₂	3	12
Lower operational costs	3	3
Reduction of waste production	2	1
Increased awareness	1	1
Creation of jobs	1	3
Direct incomes	0	1

Industrial projects can provide quantified values for reduction of emissions of CO₂, other harmful gases and substances as well as ashes and other wastes thanks to existing monitoring systems and regular controls. Current achievement based on the final reports and follow-up audits approved so far are summarized below together with national annual emissions data published⁵ by The National Centre for Emissions Management (KOBiZE) and Eurostat.

	SO ₂ (Mg/year)	NO _x (Mg/year)	CO (Mg/year)	Dust PM10+PM2 .5 (Mg/year)	Soot / ash (Mg/year)	Wastes (Mg/year)	Benzo(a)- pyrene (Mg/year)
PL04 effect	18 044,568	1 984,199	125,040	1 128,511	64,15788	40 563,08	0,00016
Annual national emissions in 2015	690 260,2	713 803,8	2 407 022,6	345 678,1	n.a.	139 000 000	139,4
% of PL04 effect on annual national emissions	2,6%	0,003%	Less than 0,001%	0,003%	-	Less than 0,001%	Less than 0,001%

⁵ See <http://www.kobize.pl/en/article/krajowa-inwentaryzacja-emisji/id/385/zanieczyszczenia-powietrza>

Additional effects of the programme have been also studied by the survey performed by IDEA Company. The main effects as identified by the survey respondents (without distinguishing between private and public bodies) in the order of frequency of occurrence are:

- Improvement of the quality of the environment (air pollution)
- Improvement of the quality of life of the inhabitants (health effects, heat comfort, visual appearance of the buildings)
- Improvement of the quality of teaching and learning (this can be translated as improved comfort of modernized schools)
- Improved accessibility to public services (modernized public buildings)
- Improvement of the image of the region for citizens and investors
- Improvement of safety of the residents (reduced fire risk, better technical condition of the buildings)
- Increased tourist attractiveness of the region (linked with environment quality and visual properties)

The main additional outcome, i.e. the **improvement of air quality** is generally measurable by air quality monitoring network. The size of the effect is very low for the most of the pollutants at national scale as presented on the table above with exception of reduction of sulphur dioxide emissions. However, comparison with national data doesn't reflect actual improvements at local scale that are much more important, though hardly quantifiable due to lack of local-level data and necessity for long-term monitoring.

6) What are the key reasons for projects failing under the different outcomes?

A total of 38 projects or project extensions (Outcome 5) have been withdrawn according to inventory of projects and the overview of projects provided in section 2.1.

The identified reasons for withdrawals include:

- Short time for implementation of the project, related complications in project launching and tender procedures – reason for failing of both public and private projects

Delays in launching the programme should be avoided in the future. It is crucial to attract enough applicants already in the beginning of the programme implementation in order to avoid time risk.

- Not feasible starting date for the project as required by the programme conditions (selected projects were required not to be launched prior signing the grant agreement) – especially for industrial projects

Linked with the previous point, timely start is necessary. However, it would be additionally recommendable to allow already started projects.

- Wrongly estimated price of supplies in the project application, which occurred to be underestimated within the tender procedure – mainly for public projects

Additional support (training, information days) for potential project applicants should be organized.

- Delays in the project implementation due to elections in Poland and connected change of responsible staff – public projects

This aspect is out of reach of the PO.

- Change of investment plans of the project promoter (change of management staff or business priorities) – mainly for private projects

This aspect is out of reach of the PO.

- Uncertain conditions for state support of RES – private projects

This aspect is out of reach of the PO.

A special case was PL0047, which was withdrawn (cancelled) for irregularity. According to the project promoter, the project has been implemented from own funds. The promoter of the project reported that the problem had seemed to be a misunderstanding of relevant documents – works were carried out based on an energy audit, whilst it seems it should have been based on the ecological effect indicators given within the application documents. The promoter commented that problems with communication with the National Fund had occurred – there was no clear signal for them that the problems were serious enough to potentially lose the funding. The project promoter would appreciate better explained guidelines in the future. The PO commented that the project had not been implemented according to the application and therefore had to be cancelled. The MT didn't acquire any other details about the reasons for cancelling the project. The PO referred to information that had been previously sent to the FMO about the case.

7) Based on the industry projects, what are the biggest barriers to projects outside the public sector being successfully implemented?

According to the questionnaire survey and interviews with the industrial project promoters, the main barrier is **difficult access to capital** including various funding schemes, which are too complicated or discriminative especially for smaller projects. The issue of **limited or excluded state aid for enterprises** (especially in the main energy sectors in Poland) represents a barrier for many of the planned project ideas.⁶ Regional aid is not relevant anymore for the major part of the power sector in Poland and horizontal aid is limited to specific activities with limited absorption capacity among the large Polish companies. **Costs of services and materials** are closely connected with the financial barrier. It was identified as relevant barrier

⁶ Enterprises are eligible under various EU funds, but only for certain types of projects in this field as explained on page 14. The problem is that the power sector still relies too much on coal and the political and legislative framework in Poland doesn't give priority to RES.

by approximately ¼ of interviewed promoters. **Administrative requirements and overall bureaucracy** connected with grant implementation and additional **loans⁷ provided to some of the projects from national resources** have negative effect as well. Moreover, the **loans are reportedly not very attractive** because the large companies can obtain comparable loan conditions at standard commercial banks. Around 1/3 of interviewed or surveyed industrial project promoters complained about **administrative requirements and payment conditions** of the PL04 programme, but also about highly complicated **procedures for obtaining relevant permissions** from state authorities in the project preparatory stage that are needed for successful launching the project (and applying under different grant schemes).

It has to be noted that the industrial projects funded within PL04 do not cover full range of possible private applicants and project ideas due to the fact that mainly large projects were funded. There are different barriers for smaller scale projects connected with the **overall policy environment in Poland** related to energy efficiency and renewable energy development (connected with current RES legislation, access to power grid and overall power sector situation in Poland, which is dominated by several large companies).

Poland clearly focuses on existing resources of coal and there is a lack of clear strategy of support to renewables. This on the other hand represents an opportunity of the future EEA/NFM energy programme how to fill the funding gaps as discussed elsewhere in this report.

8) Considering the monitoring report in 2014 and the assessments on the methodology for estimating GHG-emissions reductions: Is there room for improvement?

There are three different documents/methodologies concerning energy efficiency and GHG emissions:

- An **energy efficiency performance certificate**, which is an official document regulated by national legislation. The energy certificate of a building determines the annual value of the non-renewable primary energy demand (EP) and final energy (EK). Calculations are given in kWh/m²/year. Primary energy takes into account losses arising from its production and transmission. EP may be a larger value than EK when the heat carrier is e.g. natural gas, electricity, or lower when the carrier is biomass.
- An **ecological effectiveness audit required as an attachment to the Norwegian Fund application**, conducted according to instructions provided. This document can be prepared by people certified to issue efficiency performance certificates mentioned above. This document looks at the energy efficiency performance before and after project implementation. Additionally this document looks at reduced/avoided emission of CO₂. An ecological effectiveness audit **also contains economic effectiveness calculations**. It can therefore be considered the most comprehensive (but also the most difficult to be elaborated).
- An **ecological effectiveness audit required from the applicants of the Structural funds** (Operational Programme Infrastructure and Environment). This is worth

⁷ A complementary scheme of subsidized loans funded from Polish national sources was used by the project promoters as an additional support

mentioning, because the industrial projects were transferred from this program to the Norwegian Fund. **This document does not contain any economic calculations.** In this case the ecological effect is understood as reduction of emissions to the environment before and after project implementation. The energy efficiency calculations conducted according to legislative requirements are then used to calculate emissions of CO₂ and other substances (dust, SO_x, NO_x, which were not required at all within the Norwegian funds). Economic indicators are not looked at.

It seems that the existence of several various (although in many ways similar) methodologies caused some confusion. The methodology implemented by Polish law is quite complicated itself; it should be considered whether adding new tools, based primarily on CO₂ reduction, is the optimal solution. **However, the formulas themselves are sound and coherent.**

One of the interviewed persons (involved in a project in Tuczepy municipality, which did not receive funding) claimed the GHG calculations were methodologically inconsistent and wrong. However, we found this claim inappropriate. The Norwegian Fund ecological effectiveness analysis with respect to CO₂ emissions looks at CO₂ emissions from electricity production source. If the source of electricity consumed by the planned project is the power grid, a fixed carbon dioxide emission factor of 0.812 Mg CO₂ / MWh is imposed. This factor was defined in the methodology guideline for elaboration of ecological effectiveness audit and it is annually published by the national agency KOBIZE⁸ responsible for emissions payment system. This means that projects which do not significantly reduce power consumption or build own CHP sources fail to present a large CO₂ emissions reduction.

From the perspective of a single project this approach may seem unfair, but considering CO₂ reduction as one of the major goals – a more global approach seems reasonable.

9) Which methodology was used to assess the industry projects and their GHG reductions? Can it be considered valid?

As explained in the previous chapters, majority of industrial projects have been transferred from the reserve list of the Structural Funds. These projects had to deliver **ecological effectiveness audit according to the rules of the Operational Program Infrastructure and Environment.** The calculations served as a baseline for estimation of the GHG reductions. The methodology can certainly be considered valid.

It should also be noted that the emissions of pollutants from industrial sources are regularly and physically measured (and quite often also equipped with online monitoring of key parameters) since these large emission sources are subject to strict control performed by the state environmental protection authorities.

10) What are the common or key success factors of the completed projects?

Key success factors have been studied mainly through the questionnaire survey. The results

⁸ The National Centre for Emissions Management KOBIZE, <http://www.kobize.pl/en>

are provided in summarized form without regard to the type of project promoter:

What are the main success factors of completed projects?		
	yes	rather yes
Dedication of the implementation team	55	21
Financial strength of the applicant	53	26
Preparedness of the project from the technical point of view	48	25
Selection of the contractor	46	25
Construction supervision	45	26
Proper time planning	44	26
Experience of the applicant	43	33
Availability of staff	37	36
Technical excellence (use of the innovative solutions and BAT)	10	51
Public support	5	32
Political support	4	11

It can be confirmed by the MT that experienced and **dedicated project implementation staff** is the key factor for smooth implementation. The importance of this factor expressed by the survey respondents supports the perception of the programme and related administrative requirements (permits) being quite demanding though comparable with other funding schemes in Poland (or even slightly easier). Small municipalities with **limited human resources or unexperienced applicants** usually struggle with bureaucratic requirements connected with the projects.

The other key point is **sufficient pre-financing and smooth cash-flow** of running projects. This clearly correlates with common complaints of the project promoters about low pre-financing and excessive time taken by processing of requests for payments. The level of pre-financing as reported by the project promoters was between 10 and 40% of the total grant depending on type of applicant accordingly to the Programme Agreement section 4.1 (max 40% for public bodies, max 10% for private bodies). No advance payment was provided to projects under Outcome 4 (in accordance with the Programme Agreement).

Another factor is **smooth and proper selection of suppliers in tender procedures** and control of technical works. Problems in tenders caused several projects to be withdrawn or delayed. This issue is ruled by national legislation on public procurement, so it is basically out of reach of the PO/NFP.

Options for the future

11) What recommendations would the consultant propose for the GHG methodology under the new programme period?

In the opinion of the MT the emphasis should be put not only on avoided CO₂ emissions measured in tonnes/year. A percentage of reduction with respect to the emissions prior to project implementation would give a better view of the project ambition and targets. Large

power plants can achieve significant reductions in tonnes/year, which does not necessarily reflect serious reductions when taking into account the scale of the plant. The indicators and mathematical approach is correct, however the **current methodology strongly prefers projects involving combined heat and power (CHP) production or substantial reduction of electricity consumption.**

We would propose introducing an **additional parameter promoting introduction of innovative solutions/technologies** (not only modernisation of existing ones), such as heat pumps coupled with PV systems. **Extra points for autonomous energy solutions** (not needing external energy) would be favourable. However it is clear that this recommendation is partially in contradiction with the requirement for the best possible cost efficiency of CO₂ reduction.

**12) What recommendations would the consultant have for award and eligibility criteria and documentation for funds in the new programme period?
What is the scope for attracting private investments in renewable energy and energy efficiency?**

In accordance with the findings of the MT described in the previous points, the recommendations for award and eligibility criteria in the future programming period are as follows:

a) Eligibility criteria

- No generally applied limit for total avoided CO₂ emissions should be included. Wider range of eligible applicants should be allowed in the building programme (public bodies, public-owned private bodies, NGOs)
- Residential sector should be allowed as eligible (public, public-owned, private)
- Private houses – physical persons should be considered as eligible in case the exchange of boilers in family houses is included in the programme
- The limit of 150 EUR grant per tonne CO₂ equivalent per year reduced/avoided proposed by the Blue Book of EEA/Norway Grants 2014 – 2021 should be applied for industrial projects only. Its strict application would completely disqualify majority of potential types of supported projects including thermo-modernization of public utility buildings. None of the thermo-modernization projects supported by the PL04 programme fulfils this limit.
- It should be discussed among the NFP, the PO and the Ministry of Energy of Poland what are the consequences and possible ways of solution of the situation caused by the requirement for energy efficiency of district heating systems set by Commission Regulation (EU) No 651/2014. District heating companies remain an important source of emissions in Poland and their modernization is needed.
- Rules set by the General Block Exemption Regulation (GBER) for 2014-2020 should be reflected in eligibility criteria for the next programming period.
- Projects already started should be considered as eligible.

b) Award criteria

- The updated system of project selection implemented in the current period is

generally feasible but provides just very limited space for different expert views (scores are mostly set by fixed scales of hard indicators). It would be recommendable to include also qualitative criteria, where different evaluation experts may express their opinions. It is important to note that qualitative input is usual in almost all similar grant selection processes, such as Horizon2020 or Structural Funds. It is especially required for assessment of such aspects as overall innovativeness, feasibility of time schedule, handling of risks and other hardly quantifiable criteria.

- Small municipalities (below 2000 inhabitants) should be preferred. It may include higher grant rate (up to 85 - 90%) and possibly bonus points in the evaluation.
- Regional targeting of the interventions should reflect the situation in different voivodships (according to the air pollution map). The most problematic regions (for example Silesian Voivodship) should receive bonus points in evaluation.

c) Documentation

- The programme documentation (call documents) should be condensed in a lower number of clear documents.
- Hardcopy submissions should be abandoned, fully digital submission and project management procedures are strongly recommended.
- Special attention should be paid to clear explanation of eligibility criteria for different types of projects and applicants.
- It is highly recommended to provide more intensive support to potential applicants through a series of information days, trainings for applicants, trainings for project promoters and an online helpdesk.

d) Attracting private investments

With regard to the answers on the previous questions, there are fixed limits for the main motivation parameters - the grant size, grant rate and types of eligible projects and applicants. Nevertheless, it can be recommended to:

- open the future programme for small- to medium-scale private projects (and applicants)
- clarify the legislative limitations and possible ways of solution with the relevant government bodies
- keep the programme open for various types of private initiatives, like for example:
 - a. different RES installations
 - b. different energy efficiency measures including buildings, production technologies, reuse of heat, waste-to-energy options etc.
 - c. privately owned residential sector thermo-modernization
- enough time should be given to potential applicants for preparation of their applications

2.3. Other findings

2.3.1. General remarks to the support of some large industrial projects

The main motivation for many of the large industrial projects supported under Outcome 4 was to meet the legislative requirements for lower emissions set by the Industrial Emissions Directive. This was admitted by several of the interviewed industries. In the consultant's opinion it means that there was a relatively low motivational effect of the programme for the implementation of the projects because they had to be implemented from resources of the applicants or from commercial loans, in basically the same time frame and to the same extent, even without the public support.

It is also to be noted that the provided support was limited by the state aid limits resulting in a very low grant rate (even under 10%) in some cases. In the opinion of the consultant, large companies in the energy sector would probably cover corresponding part of the eligible costs without serious problems. On the other hand, large projects are usually professionally prepared, implemented and managed and their impacts are massive, directly measurable, verifiable and visible.

2.3.2. Sources of emissions in Poland

In order to provide baseline data for consideration of future funding priorities in the field of energy efficiency, renewable energy sources and reduced emissions, this section summarizes main information on sources of emissions of various greenhouse gases as well as other harmful substances. The sources of data were mainly the information on air quality available at the webpage of the Chief Inspectorate for Environmental Protection (<http://www.gios.gov.pl>) and Poland's National Inventory Report 2017 - Greenhouse Gas Inventory for 1988-2015 (NIR report) released by Institute of Environmental Protection and the National Centre of Emissions Management in February 2017.⁹

The Figure 1 below summarizes GHG emissions in Poland annually for 2015 in thousands of tonnes equivalent of CO₂ per sector as defined by the Intergovernmental Panel on Climate Change¹⁰. It confirms the major role of energy sector in generating emissions of GHG.

⁹ Available for download at http://www.kobize.pl/uploads/materialy/materialy_do_pobrania/krajowa_inwentaryzacja_emisji/NIR_2017_PO_L_May.pdf

¹⁰ IPCC Guidelines for elaboration of national emission inventories are available at <http://www.ipcc-nggip.iges.or.jp/public/2006gl/>

	Total [kt eq. CO ₂]		(2015-base)/base [%]
	Base year	2015	
TOTAL with LULUCF	552 327.08	355 627.13	-35.6
TOTAL without LULUCF	569 133.91	384 498.27	-32.4
1. Energy	475 027.06	316 373.50	-33.4
2. Industrial Processes and Product Use	31 400.35	28 483.57	-9.3
3. Agriculture	47 835.68	29 649.89	-38.0
4. Land-Use, Land-Use Change and Forestry	-16 806.83	-28 871.14	71.8
5. Waste	14 870.82	9 991.31	-32.8

Figure 1: GHG emissions according to main sectors in base year and in 2015 (source: NIR report)¹¹

The Energy sector is responsible for over 80% of total GHG emissions in Poland. It is further divided into the IPCC source categories listed in Figure 2.

IPCC Source Categories	Greenhouse Gas	Identification criteria (Level, Trend, Qualitative)		
		Level	Trend	Qualitative
1.A.1 Fuel combustion - Energy Industries - Liquid Fuels	CO2	L	T	
1.A.1 Fuel combustion - Energy Industries - Solid Fuels	CO2	L	T	
1.A.1 Fuel combustion - Energy Industries - Gaseous Fuels	CO2	L	T	
1.A.1 Fuel combustion - Energy Industries - Other Fossil Fuels	CO2		T	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Liquid Fuels	CO2	L	T	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Solid Fuels	CO2	L	T	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Gaseous Fuels	CO2	L	T	
1.A.2 Fuel combustion - Manufacturing Industries and Construction - Other Fossil Fuels	CO2	L	T	
1.A.3.b Road Transportation	CO2	L	T	
1.A.3.c Railways	CO2		T	
1.A.3.e Other Transportation	CO2		T	
1.A.4 Other Sectors - Liquid Fuels	CO2	L	T	
1.A.4 Other Sectors - Solid Fuels	CO2	L	T	
1.A.4 Other Sectors - Solid Fuels	CH4	L	T	
1.A.4 Other Sectors - Gaseous Fuels	CO2	L	T	
1.A.4 Other Sectors - Biomass	CH4		T	
1.B.1 Fugitive emissions from Solid Fuels	CO2	L		
1.B.1 Fugitive emissions from Solid Fuels	CH4	L	T	
1.B.2.c Fugitive Emissions from Fuels - Venting and flaring	CH4		T	
1.B.2.d Fugitive Emissions from Fuels - Other	CO2	L	T	

Figure 2: Key sources of emissions within energy sector (source: NIR 2017)

Fuel combustion is by far the largest contributor to emissions from the energy sector. It generated about 93% of total GHG emissions of the whole sector in 2015. Combustion as a source of GHG emission occurs in the following sub-categories:

- 1.A.1. Energy industries
- 1.A.2. Manufacturing industries and construction
- 1.A.3. Transport
- 1.A.4. Other sectors:
 - a. Commercial/Institutional
 - b. Residential
 - c. Agriculture/Forestry/Fishing

¹¹ LULUCF refers to Land-Use, Land-Use Change and Forestry

Time series of shares of these key sub-categories on total energy sector emissions is given in Figure 3.

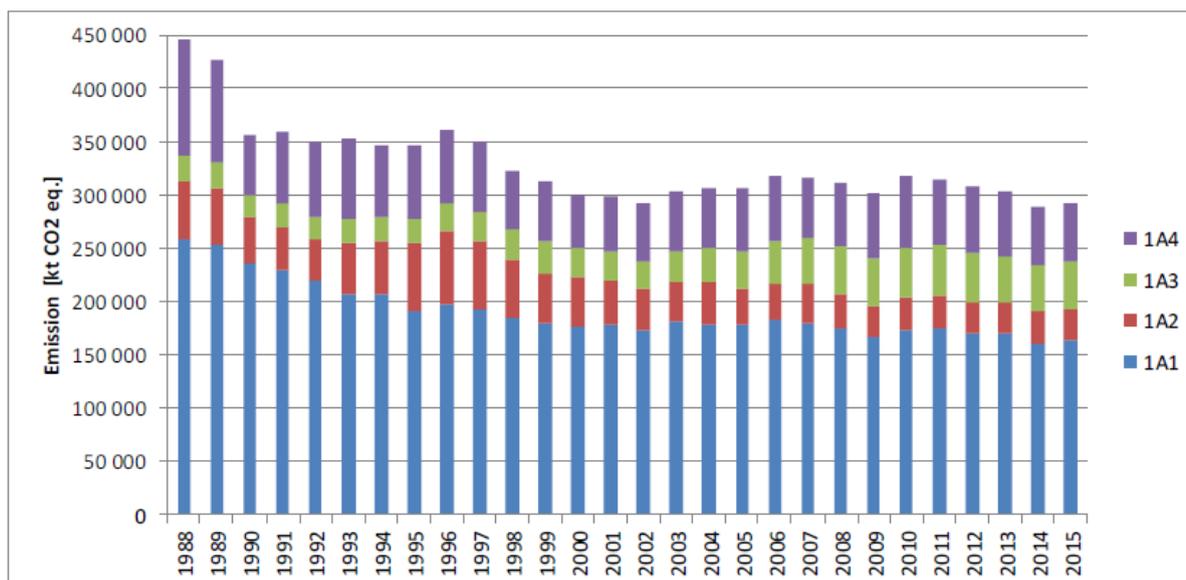


Figure 3: GHG emissions from fuel combustion in 1988-2015 according to subcategories (Source: NIR 2017)

The basic data presented above confirm the crucial role of energy industries in generation of the GHG emissions in Poland. The future grant schemes should therefore reflect it despite the fact that the energy industry projects will be limited in eligibility of activities, in size of the grant and in the grant rate as explained in the previous sections. With regard to section 2.3.1 of this report the support should be provided to projects going clearly beyond the legislative requirements, i.e. shouldn't be used just to comply with standards and limits required by law.

Further analysis of the other subcategories reveals that the main source of emissions other than energy industries and transport is the Residential sector representing prevailing part of subcategory 1.A.4 Other sectors (sub-category 1.A.4.b). The information on fuel type use in the sub-category 1.A.4.b Residential are presented in Figure 4 confirming persisting major role of solid fuels (coal and lignite) for combustion in residential sector (heating).

	2012	2013	2014	2015
Liquid Fuels	26.767	25.084	25.571	24.406
Gaseous Fuels	141.397	143.187	131.598	132.202
Solid Fuels	301.038	289.864	265.515	260.803
Other Fuels	0.000	0.000	0.000	0.000
Biomass	116.850	116.850	105.450	105.450
TOTAL	586.052	574.985	528.134	522.861

Figure 4: Use of different fuels in Residential sub-category in PJ/year (source: NIR 2017)

The leading role of Residential sector in Other sectors sub-category is apparent from Figure 5 below.

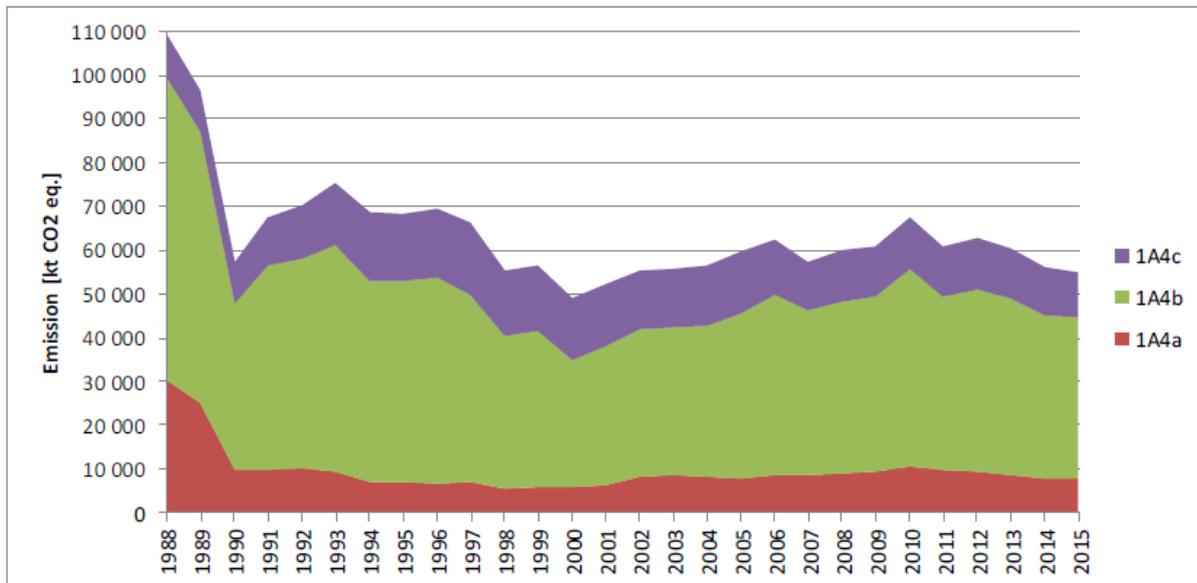


Figure 5: GHG emissions from 1.A.4. Other sectors in years 1988-2015 according to subcategories (source: NIR 2017)

A different view on role of various sectors is provided from perspective of air pollutants (i.e. not only GHG). Data available on sources of non-methane volatile organic compounds (NMVOC), PM10, nitrogen oxides and Sulphur dioxide in three main sectors (power production, residential sector and transport) presented on Figure 6 show significant role of Residential sector in sulphur emissions and dominating role in case of NMVOC and especially PM10 particulate matter (see on Figure 7).

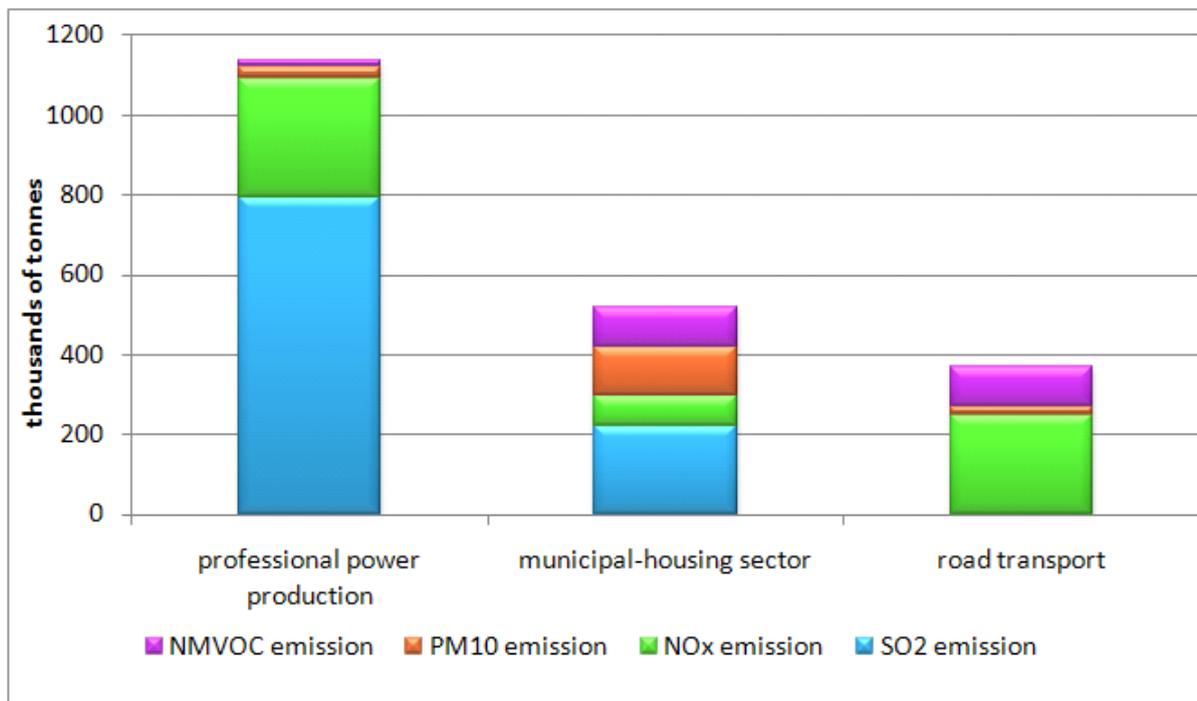


Figure 6: Emissions of major pollutants by sector: Poland 2007 (source: Polish Ministry of Environment)

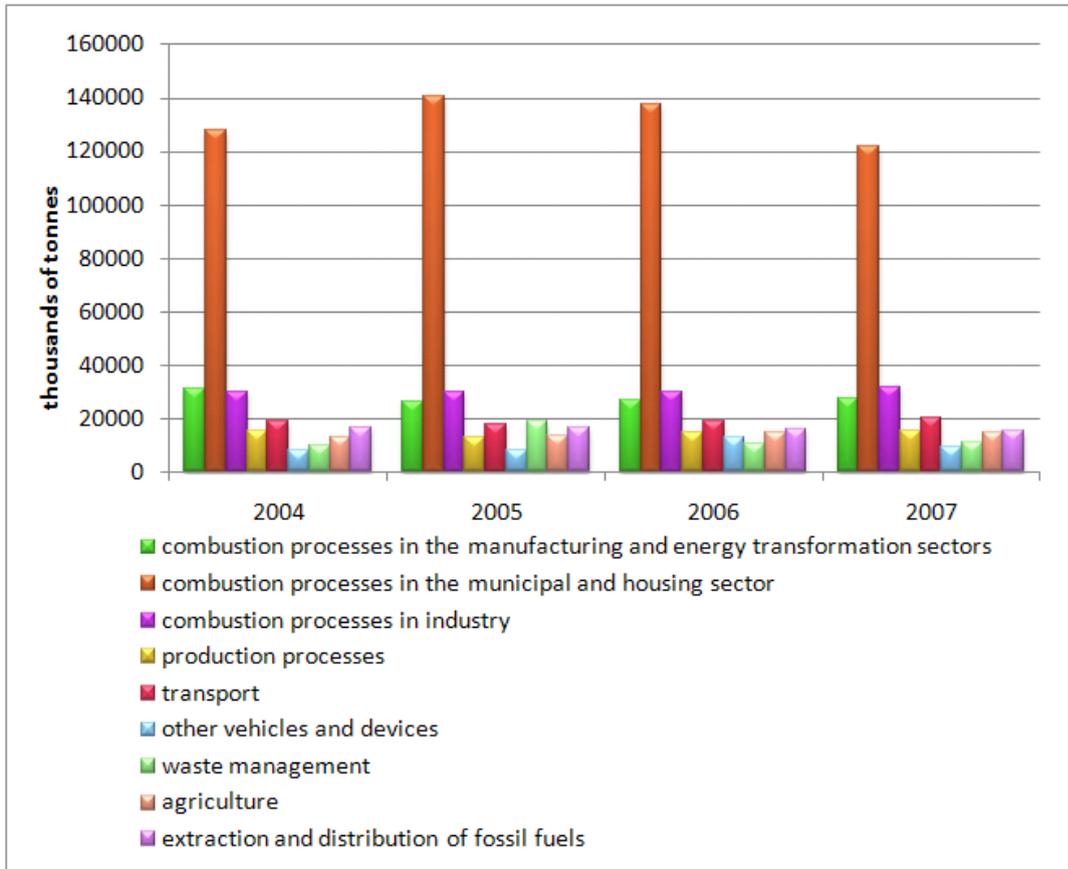


Figure 7 Emissions of primary particulate matter PM10 by sector: Poland 2000-2007 (source: Polish Ministry of Environment)

Exposure of Polish urban population to PM10 is among the highest in the EU as demonstrated in Figure 8.

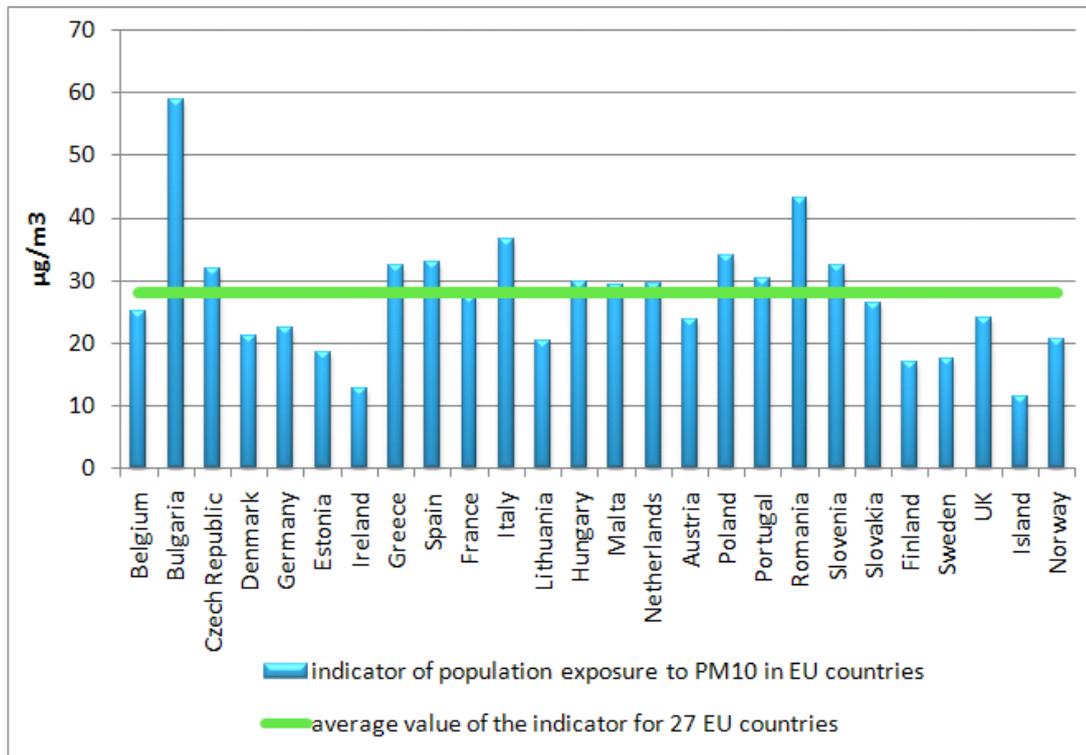


Figure 8: Exposure of EU population to PM10 pollution. (Source: Eurostat)

The MT concludes from the presented data that the **focus on municipal and housing sector is well justified not only by the reported high absorption capacity, but also by the role of the sector in generation of GHG emissions and other harmful substances**, which are very important for the country. This relates to continuation of the building programme for public sector, but also for the suggested opening of the future funding possibilities for the Residential sector (both public and private) and even the private family houses. Supported activities may also include **exchange of fuel from coal or oil to natural gas**. Poland opened a large terminal for liquefied natural gas in Swinoujscie in 2015 covering potentially up to 50% of country natural gas demand, which makes this energy carrier also reasonably secure as for supplies in a long-term view.

2.3.3. Renewable energy outlook

Roll-out of RES installations is ruled by political boundary conditions, which have been quite unstable in Poland in recent years. Poland is legally obliged by the EU Renewable Energy Directive 2009/28/EC, to achieve 15 % from renewable energy sources in gross final consumption of energy by 2020. Renewable Energy Sources Act 2015 (the „RES Act”), which is the implementation of the Directive 2009/28/EC, came into force on the 1st of July 2016 and it set a new framework for RES projects.

The RES Act implements two mechanisms of support to RES investments:

1. awarding contracts for difference (CFD) for internet based auctions (so called **Auction System**) organized by the Energy Regulatory Office, and
2. **feed-in tariffs** for micro-installations with a capacity of up to 10kW.

RES installations launched on or after 1st January 2016 were to compete in the Auction System. The Auction System replaces the **previous Green Certificates** scheme that worked well especially for co-firing (joint combustion of biomass with coal for power production) projects during 2000 - 2010. The new RES Act cut support for co-firing by a half, which made co-firing unprofitable. The RES Act also cancels support for hydro plants above 5 MW.

The Polish government adopted the RES Amendment Act in December 2015, postponing the closure of the Green Certificate System until the 30th June 2016.

The Second RES Amendment Act was signed on the 28th June 2016. The amendment cancelled separate baskets for onshore wind and photovoltaic farms in the Auction System, which can be translated as the political representation's preference of more supply-stable technologies such as the co-firing over wind or PV farms. Poland restricted the development of wind turbines also by making it illegal to build turbines within 2 kilometres from buildings or forests excluding thus 99 % of the country area, and by increasing tax payable on existing turbines, which makes them unprofitable as well.

Additionally, the Ministry of Energy can change every year which renewable technologies are preferred by defining how much electricity is allocated to the various baskets in the Auction System. This, of course, means quite unstable outlook for potential investors in RES, which actually affects also the projects submitted/supported under PL04 programme (for example the project PL0020 has been withdrawn due to uncertain feasibility under new conditions and the project PL0007 has been implemented but the operation faces serious economic problems because the state support has been reduced).

An additional element of uncertainty is newly passed law (passed by Parliament on July 20th 2017) that changes the way the substitute charge for not meeting target amounts of RE produced is calculated. The new formula sets the substitute tariff price at 125% of the annual

weighted average price of “green certificate” (excluding agricultural biogas) with a cap at 300 PLN/MWh.

Based on the above, the near future of RES development in Poland shall be probably mainly dependant on **biomass co-firing with coal and biogas installations complemented by smaller installations of other renewable resources.**

2.3.4 GHG emissions calculation for Outcome 4 projects

Reductions of emissions of GHG have not been set in target indicators for the majority of projects funded under Outcome 4. It is to be noted that Outcome 4 projects aimed at reduction of waste and emissions to air, water and ground, but not directly at reduction of GHG emissions. Many of the projects implemented have both positive or negative effects on GHG emissions due to the installation of various technologies, which consume energy and thus indirectly cause emissions on one side, but sometimes improve overall effectiveness of power production (like in case of e.g. PL0095, PL0096 or PL0010 projects) on the other side. Overall CO₂ balance of such projects would have to be calculated within a detailed energy audit that was not requested from the applicants (originally applying for support under the Structural Funds). The PO provided the following explanation to the topic:

“Unfortunately we are not able to give FMO CO₂ effect in industrial projects that originally don't have such indicator in co-financing request. It wasn't obligatory condition for obtain co-financing in the Infrastructure and Environment Programme from which pre-defined industrial projects come, so PO can't require it from Beneficiaries. Final reports which we have usually do not contain such data. We do not have also ex-post audits with CO₂ effect. Usually if Beneficiaries submit reports we are not able to verify CO₂ effect just for the project, because this reports concern whole company and under NFM co-financed is only one from many boilers or one of the electrostatic precipitators.”

The MT perceives this situation partly as consequence of the fact that the pre-defined projects were submitted in accordance with rules and requirements of other programmes than PL04 and partly due to the fact that the main objective of the projects was to reduce other emissions than just GHG. Nevertheless, for the future programming period it would be highly recommendable to request the same ecological effectiveness audit from all types of (investment) projects in order to be able to quantify GHG emissions effect at project, outcome and programme levels.

3. Stakeholders' comments

The comments of the project promoters have been discussed in detail in section 2. Therefore the section 3 focuses only on the comments of the Programme Operator and the National Focal Point as presented during the meeting held in Warsaw on 30th of May 2017.

The following list of potentially supported types of projects for the next programming period was presented by the PO based on the experience and knowledge of the existing funding gaps:

- high-efficiency cogeneration
- energy efficiency in public utility buildings and residential buildings (potentially also for housing but there remains a lot of questions related to such programme related to efficiency and feasibility, also from the administrative point of view)
- geothermal energy
- energy efficiency in medium-sized enterprises
- hydropower
- energy recovery from waste or pre-treated hazardous waste
- education/awareness raising in the field of energy efficiency

The detailed information on types of projects or applicants should be elaborated at the concept note stage to be presented to the FMO. The list will be further elaborated according to the negotiations between involved institutions. No agreement has been achieved so far.

The Programme Operator also commented on the requirement of the Blue Book for the limit of 150 EUR/ton of saved CO₂ per year, considering it as significant limitation of possible scope of the follow-up programme. Only 4 of 125 projects supported by the PL04 programme would meet this requirement. Strict application of such cost efficiency condition would completely disqualify several of the above listed types of projects. The Programme Operator also mentioned that this issue has been consulted with operators of similar programmes in other countries and they share the same doubts. It should be taken into account that some types of projects bring substantial benefits in other parameters than just reduced CO₂ emissions (especially reduced production of other pollutants such as SO₂, NO_x and dust).

The issue of many withdrawn projects was discussed as well. When it comes to the private applicants, the main reason for withdrawal (according to PO) was modification of the investment plans (due to change of company strategy but also related to changes in legislation). Another reason was overambitious ecological targets that turned out to be difficult to be accomplished when it came to project implementation stage.

The same problem (unrealistic target values, especially of CO₂ reduction) caused withdrawal of some of the projects submitted by public bodies. Some of the project promoters also failed to select the contractor able to deliver the construction works at the budgeted price. Only 1 project (PL0047) actually failed and the agreement was terminated due to irregularities.

The final comment of the Programme Operator and National Focal Point is positive – both ministries (the Ministry of Environment and the Ministry of Economic Development) consider the programme very successful despite the fact that the implementation was very

demanding. PL04 programme contributed substantially to reduction of CO₂ emissions but also of other pollutants by various types of emission sources.

4. Conclusions and recommendations

Many recommendations have already been provided in the frame of section 2 of this report. However, the main conclusions and recommendations for each key question are summarized in short below:

1) *How many of the applications received under outcomes 1, 3 and 5 came from private entities providing public services? If any of these applicants were rejected, what were the reasons?*

The total number of project applications rejected within Outcomes 1 and 3 was 36. Outcome 5 was an extension call for already running projects. The reasons for rejection included misunderstanding of eligibility criteria, failing to deliver all required documents or simply underscoring in the technical evaluation.

It is recommended to **pay more attention to clear definition of eligibility criteria in the future programme, to simplify the requirement for Ecological Effectiveness Audit and to modify the technical evaluation procedure** in order to allow different opinions of technical experts, not just mechanistic scoring according to pre-defined scales.

2) *Based on interviews and the survey, what elements of the call process seemed to have discouraged private sector applicants to apply for funding under the Norway and EEA Grants? Please provide examples to explain.*

The main distracting aspects for private applicants were:

- Requirement of minimum of 100 000 tonnes of eq. CO₂ saved per project (later lowered to 20 000 tonnes) and limited absorption capacity of large projects meeting the criteria
- Short time for preparation of project applications with all the connected annexes and permits
- Short time left for implementation of projects, especially in the later industrial call
- State aid rules limiting the grant size and grant rate for large projects
- The rule of funding only projects that haven't started prior signing the grant agreement

3) *What are the biggest barriers to attract projects, promoters and support from the private sector? What are the likely funding gaps currently facing potential project promoters seeking to invest in renewable energy and energy efficiency?*

The main barriers are:

- Legislative limitations (on state aid and on energy efficient systems)
- Form of support – the enterprises would prefer non-returnable grants instead of loans, which are comparable with standard market
- General policy barriers in Poland to roll-out of certain types of RES (hydropower, wind power) due to recent amendments of the RES Act

- Unstable and unpredictable state support to different types of RES
- Bureaucracy connected with acquiring permits and applying and implementing grant projects

The funding gaps of the private bodies are:

- Measures for reduction of emissions of other gasses than CO₂
- Small to Large RES installations of all types
- Residential sector thermo-modernization
- Exchange of boilers in family houses

4) What, if any, differences should there be in a strategy used to attract these two different target groups (public vs private) in applying for support for renewable energy and energy efficiency projects?

The public sphere expressed the following preferences for keeping the attractiveness of the future programme:

- Simplification of application and management procedures, quicker payments
- Continuing the support for building and RES projects as in the current period (there is still high absorption capacity in the sector)
- Higher advance payment, grants preferred over loans, higher grant rate for small municipalities
- Longer time needed for preparation of application
- Quality of the programme documentation has to be improved

The MT also **recommends opening the programme for NGOs and more types of public buildings in the future.**

For private bodies, it is crucial to **exclude the discriminative rules** (minimum avoided CO₂ emissions) and opening the programme for all types of enterprises with their different energy efficiency and RES ideas while keeping the ecological and economical effectiveness the main assessment criteria in order to assure high impact of the programme. **Private residential sector is suggested to be considered as eligible.** Exchange of boilers in family houses can have a noticeable effect on air quality especially in rural areas.

5) What are the most significant programme outcomes achieved of those not covered by the programme agreement?

The **programme is likely to achieve the quantified targets** defined in the Programme Agreement, though just limited number of projects is completed and verified as for the required ecological impact at the moment.

Many public projects **improved visual appearance** of the renovated buildings and reduced emissions of other substances than CO₂ and thus **improved air quality**. These effects can only be measured qualitatively in the most of the cases.

Industrial projects had measurable effects on **emissions of sulphur and nitrogen oxides** as well as other substances with negative effect on the environment and human health. The effects are (or will be) verified after 1 and 5 years of operation. Many of the modernized facilities dispose of **real-time monitoring systems** and undergo regular check from state environmental authorities. Therefore **achievement of the effects will be verifiable** in a long-term view.

6) What are the key reasons for projects failing under the different outcomes?

The main reasons for failures (mainly withdrawals) were as follows:

- Delays in project implementation
- Complications in tendering procedures (too high price resulting from a tender, delays)
- Timing of the call and signing the grant agreement incompatible with actual start of the project
- Change of responsible staff (due to elections or due to change of management staff)
- Change of investment strategy
- Unstable policy framework for support of RES in Poland (amendments of the RES Act)
- Irregularity in project implementation (PL0047)

In this context, the MT **recommends to pay attention to timely launch of the next programme** in order to avoid time constraints for projects, allowing **at least 4 - 5 months for preparation** of the projects. Elaboration of **clear and understandable programme documentation** and **considering support of already running projects** are also recommendable.

7) Based on the industry projects, what are the biggest barriers to projects outside the public sector being successfully implemented?

The main barriers for industrial projects are:

- Difficult access to capital
- Administrative and bureaucratic requirements
- Unstable policy framework

Availability and cost of services/service providers required to implement projects and the cost of energy were not identified as factors with significant influence on the roll-out of energy efficiency investments and the expansion of renewable energy

8) Considering the monitoring report in 2014 and the assessments on the methodology for estimating GHG-emissions reductions: Is there room for improvement?

and

9) Which methodology was used to assess the industry projects and their GHG reductions? Can it be considered valid?

The existence of several various (although in many ways similar) methodologies caused some confusion. The methodology required by Polish law is quite complicated itself; it should be considered whether adding new tools, based primarily on CO₂ reduction, is the optimal

solution. According to the experience from the previous programming period, **better methodological support** could prevent failures to provide formally eligible GHG calculations. Nevertheless, the methodology used for industrial projects is sound and valid.

It is recommended for the next programming period **to apply the same requirements for the ecological effectiveness audit for all types of investment projects** involving also those aiming primarily at reduction of other pollutants than just greenhouse gasses (like e.g. desulphurization, denitrification or de-dusting projects). **Overall CO2 balance of such investments should be included in the audits.**

10) What are the common or key success factors of the completed projects?

The common key success factors are:

- Dedication of the implementation team
- Financial strength, especially relating to pre-financing of the project
- Technical preparedness of the project
- Smooth tendering procedure and selection of a good supplier and technical supervisor
- Experience of the applicant with similar projects

The MT recommends in the context of this question:

- to increase the amount of pre-financing. Reasonable pre-financing is estimated at 40-60% of total grant awarded to a project. This may be even increased for small municipalities.
- to avoid unjustified delays in processing of requests for payment in the future programme. Reasonable time between submission of a request and processing the related payment should not exceed 2 months.

11) What recommendations would the consultant propose for the GHG methodology under the new programme period?

- A percentage of reduction with respect to the emissions prior to project implementation would give a better view of the project ambition and impact (relative change instead of absolute change).

***12) What recommendations would the consultant have for award and eligibility criteria and documentation for funds in the new programme period?
What is the scope for attracting private investments in renewable energy and energy efficiency?***

The recommendations listed below repeat to large extent recommendations already given at previous questions:

a) Eligibility criteria

- No limit for total avoided CO₂ emissions should be included
- Wider range of eligible applicants should be allowed in the building programme (public bodies, public-owned private bodies, NGOs)
- Residential sector should be allowed as eligible (both public, public-owned, private) as it generates an important part of emissions, especially of PM10, in Poland
- Private houses – physical persons should be considered as eligible in case the exchange of boilers in family houses is included in the programme
- In the opinion of the monitoring consultants, the limit of 150 EUR grant per tonne CO₂ equivalent per year reduced/avoided proposed by the Blue Book of EEA/Norway Grants 2014 – 2021 should be applied only for industrial projects. The consultants believe that its strict and general application would disqualify some types of potentially supported projects, including thermo-modernization. None of the thermo-modernization projects supported by the PL04 programme would fulfil this limit.
- It should be discussed among the NFP, the PO and the Ministry of Energy of Poland what are consequences and possible ways of solution of the situation caused by the requirement for energy efficiency of district heating systems set by Commission Regulation (EU) No 651/2014.
- Rules set by the General Block Exemption Regulation (GBER) for 2014-2020 should be reflected in eligibility criteria for the next programming period.
- Projects already started should be considered as eligible.

b) Award criteria

- The updated system of project selection implemented in the current period is generally feasible, but provides a limited space for different expert views. It would be recommendable to include also qualitative criteria.
- Small municipalities (below 2000 inhabitants) should receive higher grant rate of 85-90% and possibly also bonus points in the evaluation.
- The most problematic regions (e.g. Silesian Voivodship) as for air quality should receive bonus points in evaluation.
- Additional parameter promoting introduction of innovative solutions/technologies (not only modernisation of existing ones), such as heat pumps coupled with PV systems, could be added. Extra points for autonomous energy solutions (not needing external energy) would be favourable.

c) Documentation

- The programme documentation (call documents) should be condensed in a lower number of clear documents.
- Hardcopy submissions should be abandoned (digital submission of applications strongly recommended).
- Special attention should be paid to clear explanation of eligibility criteria.
- Information support to applicants and promoters should be improved. Information days for potential applicants are strongly recommended.

d) Indicators

The logic of indicators linked with overall objectives, results and impacts shall be made coherent with a standard logical frame approach in case of public projects. In many cases, the indicators of results and impacts were mixed in the current programming period. For example, number of installed solar panels is presented as indicator of impact while corresponding total installed power from RES is included under indicators of results. On the other hand, the industrial projects usually follow the logical framework in assigning indicators, but there is little technical information provided about the achieved results. No indicators of overall objectives are given for industrial projects, which makes it inconsistent with public projects. The logical framework and system of indicators should be corrected in the next period and evaluated within possible appraisal of the future programme by the FMO.

e) Attracting private investments

There are some legislative limits for the main motivation parameters - the grant size, grant rate and types of eligible projects and applicants. However, it can be recommended to:

- open the future programme for more SMEs (with smaller projects)
- clarify the legislative limitations and possible ways of solution with the relevant government bodies
- keep the programme open for various types of private initiatives, like for example:
 - a. different RES installations
 - b. different energy efficiency measures including buildings, production technologies, reuse of heat, waste-to-energy options etc.
 - c. privately owned residential sector thermo-modernization
- Enough time should be given to potential applicants for preparation of their applications (at least 4-5 months).

As general conclusion, **the PL04 programme is on track towards reaching and most likely even exceeding the targets set by the Programme Agreement.** It will also bring numerous additional effects, though many of them are hardly quantifiable, especially in the public sector. The PO managed to handle the most of the difficulties that occurred during the programme implementation and the prevailing overall impression of the project promoters as well as of the MT about the programme, its impacts and about the work of the PO and the NFP is satisfactory. There still exists high absorption capacity for similar future programme in area of public buildings and RES. Presumably very high and currently unused potential lies also in the private sector, which can be exploited if the recommendations of the MT given in this report are considered in the new programme design and implementation.

5. List of annexes

Annex 1: Overview of the projects investigated within the monitoring

Annex 2: Summary of the site visits

Annex 3: Summary of the questionnaire survey

Annex 4: Summary of the phone interviews

Annex 5: Summary of the project reviews

**Annex 6: Working translation of Guidelines of the Czech Boiler Exchange Programme
(separate document)**

Annex 1: Overview of the projects investigated

Project name and number	Type of applicant	Status	MONITORING TASKS			
			ONSITE	REVIEW	CALL	SURVEY ANSWERED
PL04-0050 - Thermal renovation of hospital buildings in Gołdap	public authority	withdrawn		YES	YES	
PL04-0104 - Thermo-modernization. Saving and promotion of renewable energy in utility buildings of the municipality of Zblewo.	public authority	completed		YES		
PL04-0099 - Modernization of the energy system at the Powdered Milk Limited Liability Company to reduce emissions.	private enterprise	completed		YES	YES	
PL04-0094 - Modernisation of the FGD systems in Units 5 and 6 of Elektrownia Bełchatów (EB)	private enterprise	completed		YES	YES	YES
PL04-0024 - Retrofitting of a building pavilion hospital No. 1 with the replacement of the built-in energy-efficient lighting	public authority	ongoing				YES
PL04-0111 - Thermo-modernization of municipal public buildings, rural junior high schools and community centers in the Municipality of Dziadowo	public authority	ongoing				YES
PL04-0048 - Improving the energy efficiency of hospital buildings to protect health through the thermo-modernization and installation of energy-efficient lighting	private body providing public services	ongoing				YES
PL04-0049 - Reduction of CO2 emission and energy use in selected buildings of the Silesian University of Technology through the production of electricity and heat from renewable energy sources and the modernization of indoor lighting	public authority	ongoing		YES	YES	YES
PL04-0052 - Complex thermal efficiency improvement and high-performance production of electricity and heat	private body providing public services	ongoing	YES	YES	YES	YES
PL04-0083 - The thermal modernization of educational facilities in Radom	public authority	ongoing		YES	YES	YES
PL04-0080 - Thermal modernisation of public utility buildings	public authority	ongoing				YES
PL04-0103 - Thermo-modernization of utility buildings and installation of photovoltaic cells in public buildings in the municipality of Skala	public authority	ongoing				YES
PL04-0065 - Thermal modernization of public utility objects in Kłodzko municipality stage I	public authority	ongoing		YES	YES	
PL04-0055 - Improving the energy efficiency of the building Specjalist Hospital Sz.Starkiewicza in Dąbrowa	public authority	ongoing		YES	YES	

			MONITORING TASKS			
Project name and number	Type of applicant	Status	ONSITE	REVIEW	CALL	SURVEY ANSWERED
Górnica						
PL04-0131 - Improving energy efficiency of buildings of the Regional Inspectorate of Environmental Protection (WIOŚ) in Poznan and its branch office in Kalisz	public authority	ongoing				YES
PL04-0082 - Thermo-modernisation of public facilities in Poznan	public authority	ongoing				YES
PL04-0122 - Thermo modernization of objects: Public Junior High School No. 2, Public Schools Complex No. 4 and Primary School No. 6 in Świnoujście	public authority	ongoing	YES	YES	YES	
PL04-0123 - Thermal Upgrading of Public Buildings in the Commune of Zarszyn	public authority	ongoing				YES
PL04-0132 - Thermomodernization of public utility buildings in Maków Podhalański Commune	public authority	ongoing				YES
PL04-0051 - Thermal efficiency improvement of public buildings Municipality Barlinek	public authority	ongoing				YES
PL04-0116 - Thermal efficiency improvement of the Special Care and Educational Center's building in Piława Górna	public authority	completed		YES		
PL04-0100 - Reducing emissions through the modernization of boilers WR-25 in RADPEC S.A.	public authority	completed		YES		YES
PL04-0109 - "Thermomodernization of school in Kamienny Most"	private enterprise	ongoing		YES		
PL04-0079 - Thermo-modernization and lighting replacement at the Children's Hospital in Warsaw	public authority	ongoing				YES
PL04-0057 - Thermal efficiency improvement of buildings housing the town hall, primary school and middle school in Wierzchowo as well as a school complex in Świerczyna	public authority	ongoing				YES
PL04-0054 - Thermo-modernization of educational buildings in the Ostróda region	public authority	ongoing				YES
PL04-0105 - Overall thermomodernization and interior lighting modernization of the facilities of Szpital Miejski w Rudzie Śląskiej Sp. z.o.o. at Wincenty Lip Street 2.	private body providing public services	ongoing			YES	YES
PL04-0120 - Comprehensive thermal efficiency improvement of teaching and administrative building of the University of Warmia and Mazury at pl. Łódzki 3 in Olsztyn".	public authority	ongoing				YES

			MONITORING TASKS			
Project name and number	Type of applicant	Status	ONSITE	REVIEW	CALL	SURVEY ANSWERED
PL04-0084 - The thermo-modernisation of public buildings	public authority	completed		YES		
PL04-0046 - Improvement of energy efficiency in buildings	public authority	ongoing				YES
PL04-0102 - Fume cleaning node together with modernization of ECII in Zakłady Chemiczne "Police" S.A.	private enterprise	ongoing		YES	YES	
PL04-0101 - Flue Gas Treatment Plant in Zakłady Azotowe w Tarnowie-Moscicach S.A.	private enterprise	ongoing			YES	
PL04-0095 - Construction of a SO2 reduction system in unit no. 5 at Turów Power Plant	private enterprise	ongoing	YES	YES	YES	YES
PL04-0096 - Construction of a sulphur oxides reduction system in unit no. 6 at the Turów Power Plant	private enterprise	ongoing	YES	YES	YES	YES
PL04-0085 - Thermal modernization and improvement of energy efficiency in public hospital in Zwolen	public authority	ongoing				YES
PL04-0118 - "Thermal efficiency improvement of district organizational units of the Iławski District"	public authority	ongoing				YES
PL04-0113 - Improving the energy efficiency of a public building through comprehensive thermo-modernisation of the Municipal Office in Kalety at ul. Żwirki i Wigury 2.	public authority	ongoing				YES
PL04-0041 - Complex thermo-modernization of the Dom Pomocy Społecznej (Social Assistance Home) in Przatówek	public authority	completed		YES		YES
PL04-0093 - "Construction of Wet Flue Gas Desulphurisation system based on Lime-Gypsum Technology in Elektrociepłownia Gdynia " in Gdynia	private enterprise	ongoing		YES	YES	YES
PL04-0119 - LIPIE COMMUNE IS CHANGING ITS IMAGE THAT INTRODUCES ECO INVESTMENTS WHICH IMPROVE EFFICIENCY IN ENERGETICS IN THE PUBLIC UTILITY BUILDINGS	public authority	completed		YES		
PL04-0098 - Reducing emissions through the reconstruction of combustion installations and dust removal systems in Heating Company in Ciechanow Limited Liability Company	private enterprise	completed		YES		
PL04-0010 - Reduction in gas and dust emissions at Synthos Dwory	private enterprise	ongoing		YES		YES
PL04-0001 - Educational and promotional activities in the field of energy efficiency and use of renewable energy including the environmentally	public authority	completed		YES		

			MONITORING TASKS			
Project name and number	Type of applicant	Status	ONSITE	REVIEW	CALL	SURVEY ANSWERED
friendly houses						
PL04-0016 - Installation of two new WR 25 boiler dust removal systems in the combined heat and power plant K-173 in Opole	private enterprise	completed		YES		
PL04-0017 - Installation of two new boiler dust removal systems in the combined heat and power plant in Kluczbork	private enterprise	completed		YES		YES
PL04-0047 - Thermal efficiency improvement of public buildings in the City of Toruń	public authority	withdrawn		YES	YES	
PL04-0019 - Construction of gas based power generating units GT 50 in EDF Toruń	private enterprise	ongoing		YES	YES	
PL04-0023 - Thermal efficiency improvement of public buildings in Węglińiec	public authority	completed		YES		YES
PL04-0070 - Improving energy efficiency and adaptation of the building of resocialization - sociotherapeutic Institutions in Oława	public authority	completed		YES		YES
PL04-0097 - Construction of a system for reducing nitrogen oxide emissions from units 1-3 at the Turów Power Plant	private enterprise	completed	YES	YES	YES	
PL04-0069 - Improving the energy efficiency of public buildings in Rzeszow	public authority	ongoing				YES
PL04-0027 - Retrofitting of primary schools in Poloski and Educational Institutions in Piszczac	public authority	completed		YES		YES
PL04-0004 - Energy saving operations in public buildings in Pultusk District	public authority	completed		YES		
PL04-0008 - Reduction of pollution emission by modernization of the dust extracting installation and the WR 5-022 boiler in PEC Sp. z o.o.	private enterprise	completed	YES	YES		YES
PL04-0021 - Improving the energy efficiency at communal facilities in Tarnów	public authority	ongoing				YES
PL04-0025 - Thermo-modernization and the purchase and installation of solar collectors to the Municipal Sports and Recreation Center (MSaRC)	public authority	ongoing				YES
PL04-0026 - Thermal modernisation of a school building in Wejherowo	public authority	ongoing				YES
PL04-0028 - The city of Żory - improving the energy efficiency of public education buildings	public authority	completed		YES		
PL04-0032 - Improving energy efficiency through thermomodernisation of Lubin Regional Health Centre Ltd. facilities	private body providing public services	ongoing		YES	YES	

Project name and number	Type of applicant	Status	MONITORING TASKS			
			ONSITE	REVIEW	CALL	SURVEY ANSWERED
PL04-0034 - Thermomodernisation of the School Complex in Głogówek	public authority	ongoing				YES
PL04-0058 - Improving energy efficiency by thermo-modernization of health facilities and the use of photovoltaic installation in SP ZOZ MSW in Szczecin	public authority	withdrawn				YES
PL04-0060 - Comprehensive thermal modernisation of 4 didactic and administrative buildings of University of the Warmia and Mazury in Olsztyn	public authority	ongoing				YES
PL04-0061 - Thermal Insulation Upgrading of the Complex of Secondary Education Schools no. 15 in Kielce at ul. Krzemionkowa 1	public authority	ongoing				YES
PL04-0062 - Thermal modernization of the administrative building of the municipality in Kluczbork	public authority	ongoing				YES
PL04-0068 - Complete thermo-modernization for buildings of Hospital in District Zawiercie together with construction of the solar installation for increasing of energy production from the renewable sources.	public authority	ongoing				YES
PL04-0071 - Improved energy efficiency in buildings of the Regional Hospital in Kolobrzeg	public authority	ongoing	YES	YES	YES	YES
PL04-0077 - Thermomodernization and solar installations at Caritas of Kielce Diocese	private body providing public services	ongoing				YES
PL04-0089 - The improvement of energy efficiency in public utility buildings in Ślesin	public authority	ongoing				YES
PL04-0091 - Execution of the Wet Flue Gas Desulphurisation (FGD) System for Boilers K1, K2, and K3 in Elektrociepłownia Wrocław	private enterprise	ongoing		YES	YES	YES
PL04-0092 - Construction of the Flue Gas Desulphurisation (FGD) System in Elektrociepłownia "KRAKOW" S.A.	private enterprise	ongoing	YES	YES	YES	YES
PL04-0107 - Thermal efficiency improvement of public buildings in Sanok	public authority	ongoing				YES
PL04-0142 - Termomodernization of communal facilities in Tarnów – stage II	public authority	ongoing				YES
PL04-0141 - Increase the energy efficiency of buildings POLSKA GRUPA MEDYCZNA Sp. z o.o. Hospital in Blachownia 16 Sosnowa Str. by partial thermal efficiency improvement and using renewable energy sources	private body providing public services	withdrawn		YES		
PL04-0140 - "Thermal modernization of educational facilities in the Municipality of Dębica - Phase II"	public authority	ongoing				YES

			MONITORING TASKS			
Project name and number	Type of applicant	Status	ONSITE	REVIEW	CALL	SURVEY ANSWERED
PL04-0139 - Saving energy and promotion of renewable energy sources in the Department of Pediatrics at Polish Mother's Memorial Hospital - Research Institute in Lodz.	public authority	ongoing				YES
PL04-0138 - Boiler renovation and thermomodernization of the building of the clinics specialist at Śniadecki Specialized Hospital in Nowy Sącz, located at Aleje Wolności 49	public authority	ongoing				YES
PL04-0137 - Increasing the energy efficiency of building Provincial Hospital in Bielsko-Biala by partially thermo-modernization and use renewable energy sources	public authority	ongoing				YES
PL04-0135 - Retrofitting of public buildings and educational institutions in the Korfantów Commune	public authority	withdrawn	YES			
PL04-0134 - Thermal upgrading of primary school no. 11 in Bedzin	public authority	ongoing				YES
PL04-0133 - Improving the energy efficiency of buildings SPZOZ in Pajęczno to reduce greenhouse gas emissions and air pollutants and replacement of light sources with energy-saving LED	public authority	ongoing				YES
PL04-0127 - Thermal modernization of public utility objects on the area of the following municipalities: Wyszogród, Gostynin, Pacyna, Bielsk	public authority	ongoing				YES
PL04-0108 - ENERGY EFFICIENCY IMPROVEMENT OF THE COMPLEX OF PUBLIC SCHOOLS BUILDINGS IN DOBRZANY	public authority	ongoing				YES
PL04-0030 - Thermomodernization and installation of photovoltaic cells in public buildings in the municipality of Nowe Miasto	public authority	withdrawn			YES	
PL04-0031 - Replacement of the heat source at the Indoor Swimming Pool at the Sport and Recreation area in Bolesławiec.	private body providing public services	withdrawn			YES	
PL04-0106 - Improving the energy efficiency of buildings of the Education Centre "Happy News 2000" based in Piekary	private body providing public services	withdrawn			YES	
PL04-0020 - Modernisation of a heat and power plant in Kalisz through a partial replacement of coal heat sources with a cogeneration biomass unit	private enterprise	withdrawn			YES	
PL04-0018 - Construction of a gas-steam power generating source in DALKIA Poznań	private enterprise	withdrawn			YES	
PL04-0003 - Improving the energy efficiency of health facilities through the thermo-modernization and installation of solar collectors in Nowy Szpital we Wschowie Limited liability company	private body providing public services	ongoing			YES	

Project name and number	Type of applicant	Status	MONITORING TASKS			
			ONSITE	REVIEW	CALL	SURVEY ANSWERED
PL04-0073 - Thermal modernization the school building with the reconstruction of the heating system	public authority	completed		YES		YES
PL04-0013 - Limiting the emission of dust into the air by building fume extraction plants	private enterprise	completed		YES		
PL04-0009 - Reduction of gas and dust emissions in the air from the municipal heating station in Słubice	private enterprise	completed		YES		
PL04-0117 - Thermo-modernisation of the hospital building complex in Sokolow Podlaski	public authority	ongoing				YES
PL04-0042 - Increasing the energy efficiency of the building of the Independent Public Health Care Center in Glubczyce	public authority	ongoing				YES
PL04-0128 - Improving the energy efficiency of buildings in elementary schools No. 1 and 2 in the municipality Brzeszcze	public authority	ongoing				YES
PL04-0087 - Thermal retrofitting of public buildings in Ostroda	public authority	ongoing				YES
PL04-0056 - Modernization of heating and energy systems in Bystrzyca's hospital building to reduce CO2 emissions and improve energy effectiveness	private body providing public services	ongoing				YES
PL04-0011 - Modernization of a flue gas desulphurization plant for boiler 3K	private enterprise	completed		YES		
PL04-0012 - Construction of a flue-gas desulfurization plant	private enterprise	completed		YES		
PL04-0014 - Reduction of dust emission in the electrical power and heating plant Inowroclaw through the modernization of electrostatic precipitators OP 110 No 2 and 4	private enterprise	completed		YES		YES
PL04-0015 - Reduction of dust emission from the electrical power and heating plant Inowroclaw through the modernization of electrostatic precipitators	private enterprise	completed		YES		YES
PL04-0007 - Reconstruction of boiler K1 in order to adapt to the combustion of biomass in Siekierki, Warsaw	private enterprise	ongoing	YES	YES	YES	YES
PL04-0110 - THERMOMODERNIZATION AND IMPLEMENTATION OF RENEWABLE ENERGY RESOURCES IN SCHOOL COMPLEX IN CHODÓW – A GREEN WAY TO IMPROVE ENERGY EFFICIENCY	public authority	completed		YES		YES

Annex 2: Summary of the site visits

Project number and title	PL0008 - Reduction of pollution emission by modernization of the dust extracting installation and the WR 5-022 boiler in PEC Sp. z o.o.
Type of promoter and Outcome	Outcome 4, Municipal heating company, SME
Date of visit	May 24, 2017
Person interviewed	Grazyna Kolowiecka (company manager) + other company staff
Short project summary	The objective of the project was improvement of the air condition in Świnoujście through the modernization of the dust extracting installation and the auxiliary devices of the WR5-022 K-1 boiler in PEC Sp. z o.o. The project implementation facilitates the reduction of dust emission below 100 (mg/m ³).
Key results	<p>Applicant: private company fully owned by municipality of Swinoujscie (i.e. private entity providing public services, 30% grant)</p> <p>Status: Project Completed. Final report approved. Closed in 2013.</p> <p>Results:</p> <ul style="list-style-type: none"> • increase of the dust removal system efficiency • reduction of pollution from K-1 boiler by 231,76 [mg/year] including reduction of: SO₂ by 0,97 [Mg/year], NO_x by 0,40 [Mg/year], CO₂ by 210,00 [Mg/year], CO by 1,00 [Mg/year], dust by 13,18 [Mg/year], soot by 0,00648 [Mg/year], Benzopyrene by 0,00016 [Mg/year], boiler slag by 6,20 [Mg/year] • reduction of the charges incurred for economic usage of the environment concerning K-1.
Strengths & weaknesses	<p>Strengths: Project targets achieved, outcomes measured in real time and controlled by independent state authority twice a year – reliable results, sustainable,</p> <p>Weaknesses: not found</p>
Recommendations for improvement, should this project continue into future funding mechanism	<p>The PP stressed out the requirements of EC 651/2014 Art 124 – requirement for energy efficient systems – applied in 2014 in Poland. It is required for all types of projects relevant to heating projects. 95% of district heating companies in Poland do not qualify and are therefore excluded from future grants.</p> <p>The promoter would like to exclude this rule from the EEA grants in the future enabling district heating companies to apply under the new programme. Polish association of district heating companies reportedly raised this issue to the Ministry of Energy. There is a chamber of heat companies trying to push exclusion of the requirement. The PP also needs more time for application preparation.</p> <p>Suggested areas for support in the future:</p> <ul style="list-style-type: none"> • Reconstruction of the energy source and distribution network – to meet Directive on Emissions all requirements of environmental legislation. • Equip boilers with filters for sulphur, dust, nitrogen

- Change of technology from channelled to insulated
- Removal of individual substations for buildings (changing temperature usable in the buildings) 50%
- Cogeneration projects – it would need at least 50% grant rate



Figure 9: New desulphurization and de-dustification plant in PEC company in Swinoujscie

Project number and title	PL0071 - Improved energy efficiency in buildings of the Regional Hospital in Kolobrzeg
Type of promoter and Outcome	Outcome 1, regional hospital, public authority
Date of visit	May 26, 2017
Person interviewed	Grzegorz Sosna (hospital manager) + other management staff
Short project summary	The objectives of the project were: i) plumbing modernisation; ii) central heating modernisation; iii) solar thermal collector installation; iv) thermal insulation of buildings; v) lighting replacement to low-energy (LED), vi) and energy management system installation
Key results	<p>Applicant: public-owned hospital Status: project completed but not closed (final report still to be submitted, final payment not received) Results: targets achieved (with some changes corresponding to unexpected findings during the construction works), impacts are calculated by the energy auditor (will be confirmed later by measurement): CO₂ – 4168,3 tonnes/year Production of RES energy 262,841 MWh/year Calculation appropriate according to the guidelines.</p>
Strengths & weaknesses	<p>Outcomes achieved. Other outcomes: - visual properties of the buildings significantly improved - Thermal comfort of patients improved - Decreased costs for heating Problems reported by the PO:</p> <ul style="list-style-type: none"> • Change of staff at the ministry – delay of 3 months (the Ministry not communicative) • Public procurements are difficult when price is the main decisive factor • Short time for preparation of application especially regarding the requirement for energy audit • Problem with own financing – the hospitals have to take loans • The PP would appreciate higher advance payment (original was 10%, the PP had to negotiate 40% with the PO) • Higher grant rate for hospitals needed
Recommendations for improvement, should this project continue into future funding mechanism	<p>Representative of the PP confirmed absorption capacity for similar projects in the future. There are 41 hospitals in the region of West Pomeranian Voivodship – 30% of them would still need energy efficiency/savings projects, 6 of the hospitals in the region have used the EEA grants during the current period. EEA grants are reported as one of the easiest programmes to handle compared e.g. to Regional Operational Programme.</p>



Figure 10 Thermo-modernization of public hospital in Kolobrzeg



Figure 11 Solar panels on the roof of the public hospital in Kolobrzeg

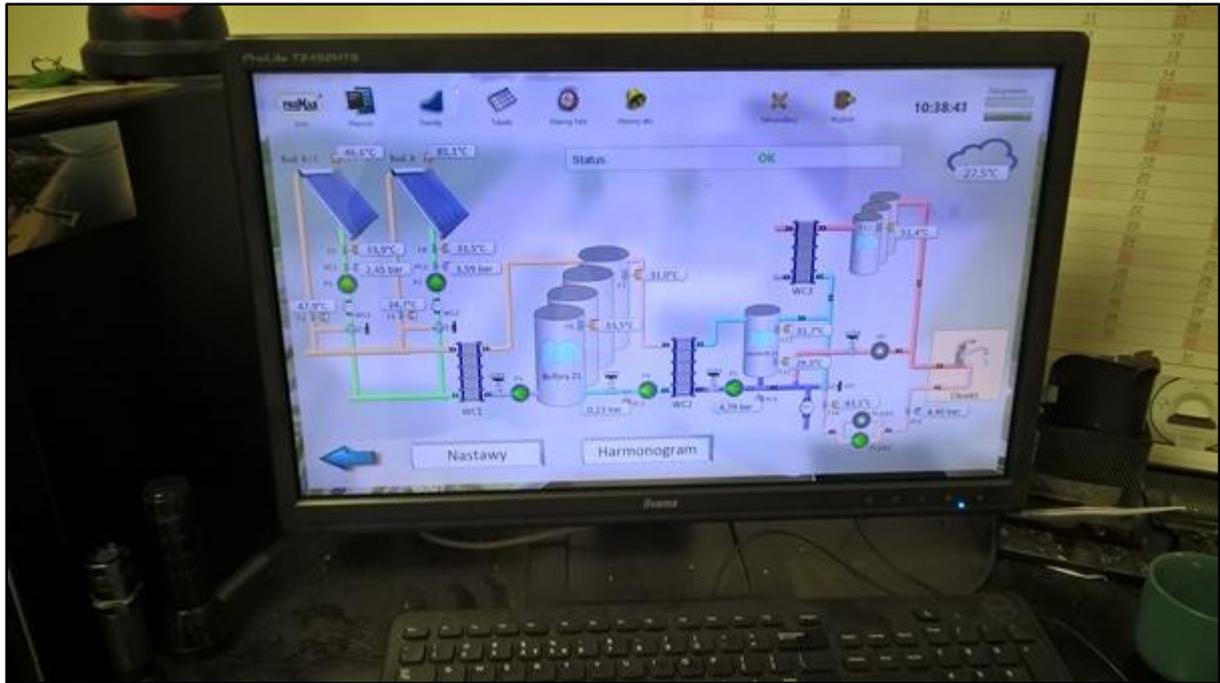


Figure 12 Control SW for solar heating system in the public hospital in Kolobrzeg

Project number and title	PL0122 – Thermo-modernization of objects: Public Junior High School No. 2, Public Schools Complex No. 4 and Primary School No. 6 in Swinoujscie
Type of promoter and Outcome	Outcome 1, municipality – public schools, public authority
Date of visit:	May 25, 2017
Person interviewed:	J. Rzemieniecka-Grudzien (investment manager) and other staff of the municipality
Short project summary	Nearly 15.5 thousand square meters of buildings in three schools - Public Secondary School No. 2, Public Schools Complex No. 4 and Primary School No. 6 - underwent a thorough thermo-modernization. Despite thermal insulation of walls with elevation of the buildings, there were also replaced windows and doors. Modernization was also undergone a central heating installation. Central heating installation was modernized, as well.
Key results	<p>Applicant: public - municipality operating public schools Status: Completed, approved – final report not submitted, final payment not done. Delays in closing the project – final audit had to be tendered (to confirm the achieved energy effect). Results:</p> <ul style="list-style-type: none"> • thermal insulation of external walls of overground floors, • thermal insulation of external walls of basements, • thermal insulation of basements' walls at the ground, • thermal insulation of full flat roofs, • thermal insulation of ventilated flat roofs, • replacement of windows, • replacement of external doors, • complex replacement of central heating installation in the Upper-Secondary School Complex No. 4 and modernization of the central heating installation in the Primary School No. 6 and Public Junior High School No. <p>Additional effects: visual properties of the buildings – renovated. Comfort of pupils and students improved.</p>
Strengths & weaknesses	<p>The total indicators' targets were achieved, though in different components (different actual surfaces of the facades and numbers of doors and windows). Avoided CO₂ emissions were then calculated – calculation done according to the guidelines. Original grant rate was 80%, but the PP had to co-finance some part of the constructions because some rooms in the schools are used for commercial purposes – actual grant rate was 53%.</p>
Recommendations for improvement, should this project continue into future funding mechanism	<ul style="list-style-type: none"> • There are many buildings in the city that require thermo-modernizing, so the PP would appreciate continuation of the programme in similar setting. • PL04 programme has been found administratively very demanding compared to Regional funds and Structural funds. It has been noted by the very experienced and skilled staff

responsible for grant projects at the municipality administration (with experience with tens of previous projects). The PP assumed overloading of PL04 project managers, who work centrally from Warsaw and handle many projects at the same time.

- Timing of the call was difficult; it would be appreciated if there are more calls (one per year). More frequent calls are necessary especially for larger applicants with high number of buildings – it is then very demanding to perform many projects in parallel.
- Application form should be clearer, it requires technical knowledge. Therefore the application was mostly done by the external auditor - the employees of the municipality were not able to fill it in.
- More friendly forms – more understandable, better availability of contact points.
- Digitization needed – still a lot of paperwork involved in PL04. Every page has to be signed and sent by regular mail (together with electronic email form). It can be simplified according to usual practice in SF – fully electronic. SL2014 system is used for it by Structural Funds (highly recommended).



Figure 13 Thermo-modernized building of Public Grammar School No.2 in Swinoujscie

Project number and title	PL0095 - Construction of a SO₂ reduction system in unit no. 5 at Turów Power Plant and PL0096 - Construction of a sulphur oxides reduction system in unit no. 6 at the Turów Power Plant
Type of promoter and Outcome	Outcome 4, power industry, private large company
Date of visit	June 28, 2017
Person interviewed	Joanna Stefanska, Teresa Michalczyk and other staff of the company
Short project summary	<p>The wet flue gas desulphurisation plant for units 5 and 6 is the second level of the sulphur oxides reduction. Its operation allows for simultaneous reduction of both SO_x and dust emissions. In addition, the parameters guaranteed by the plant contractor are the reduction of the HF and HCl emissions. The maximum emission values of these substances are technological guarantees and are as follows: for HCl <5mg / m³ USR and for HF <2mg / m³ USR. The achievement of the aforementioned values will be confirmed by the guarantee measurements whose launch is scheduled for 28. 06.2017.</p>
Key results	<p>Applicant: large company PGE GIEK s.a. supplying ca 38% of electricity in Poland</p> <p>Status: completed, but final payment not received – final verification measurement (audit) has to be delivered to prove achievement of results (despite the online measurement confirms it). Independent measurement has to be provided (just started on the day of the site visit). Grant rate 10 – 14%.</p> <p>Results:</p> <p>PL0095: reduction of SO₂ oxides emission – the value before: 2,584,37 Mg / year; the value after: 1,461.16 Mg / year reduction of dust emission – the value before: 190.12 Mg / year; the value after: 77.8 Mg / year and not exceeding within the sustainability period the SO₂ emission level of 200 mg / m³u and the dust 20 mg / m³u in accordance with Directive 2010/75 / EU of the European Parliament and of the Council of 24.11.2010 on industrial emissions.</p> <p>PL0096: Physical reduction of SO₂ oxides emission – the value before: 3,062.25 Mg / year; the value after: 1,881.58 Mg / year reduction of dust emission – the value before: 201.46 Mg / year; the value after: 83.39 Mg / year and not exceeding within the sustainability period the SO₂ emission level of 200 mg / m³u and the dust 20 mg / m³u in accordance with Directive 2010/75 / EU of the European Parliament and of the Council of 24.11.2010 on industrial emissions.</p>
Strengths & weaknesses	<p>Strengths: additional effects obvious and measurable within regular measurements (undergoing during the onsite visit):</p> <ul style="list-style-type: none"> • improvement of air quality • limited release of other compounds: HCL, HF, heavy metals • increased public awareness • effects directly measurable (online monitoring and regular independent measurements)

Project number and title	PL0097 - Construction of a system for reducing nitrogen oxide emissions from units 1-3 at the Turów Power Plant
Type of promoter and Outcome	Outcome 4, power industry, private large company
Date of visit	June 28, 2017
Person interviewed	Joanna Stefanska, Teresa Michalczyk and other staff of the company
Short project summary	The construction of an installation for the nitrogen oxides emission reduction at units no. 1 - 3 in the Turów Power Plant using a selective non-catalytic reduction method using urea allowed the facility to be adapted to the new emission standards that became effective on 1 January 2016.
Key results	<p>Applicant: PGE GIEK s.a. – large company</p> <p>Status: fully completed, closed and paid. Grant rate 30%. The first installation start-up was held in 2013. The next few years, i.e. 2014 and 2015, are the limited work of the installation, which allows us to gather experience and optimize the operation. The first year of full operation of the SNCR system with respect to limited emission standards was 2016.</p> <p>Results:</p> <p>The execution of the task allowed to comply with the emission standards, which as of January 1, 2016, became stricter, i.e. the limit went down from 400mg / m³ to 200mg / m³.</p>
Strengths & weaknesses	<p>Strengths:</p> <ul style="list-style-type: none"> • Professionally implemented project • BAT involved • Online measurement of impacts <p>Weaknesses:</p> <ul style="list-style-type: none"> • Motivated by legislative requirement • Low grant rate (because of limits of state aid in Poland)
Recommendations for improvement, should this project continue into future funding mechanism	<p>The PP reported excessive administrative requirements of PL04 programme, delays in payment and processing documents at the PO. Additional one year of full operation is necessary in order to assess whole effect of the project (combined with PL0095 and PL0096 at the same power plant).</p> <p>Large companies are limited by regional aid (max 20M PLN per project, which is quite low for industrial project of this scale), moreover, General Block Exemption Regulation (GBER) 2014-2020, the horizontal aid allows us to finance only areas such as:</p> <ul style="list-style-type: none"> • Renewable energy sources (only in the form of loans) • Energy efficiency projects • Construction and modernization of heating networks <p>Areas of interest for coal sector (which is still highly important in Poland):</p> <ul style="list-style-type: none"> • New supercritical coal-fired units (new unit in the Turów Power Plant and in the Dolna Odra Power Plant) • Adaptation of existing installations to the BAT requirements <p>There is also a great interest in the sector to develop new low</p>

	<p>emission technologies in the field of Research & Development:</p> <ul style="list-style-type: none"> • CCU (carbon capture and utilization) installations • Coal gasification • Alternative forms of UPS management • Energy storage <p>Loans are not attractive for large businesses, because they can get even better interests at standard bank market than by “subsidized loans” provided by the PO.</p>
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Figure 15 Urea denitrification control unit in Turów power plant



Figure 16 Storage of urea for denitrification in Turów power plant

Project number and title	PL0092 - Construction of the Flue Gas Desulphurisation (FGD) System in Elektrociepłownia "KRAKOW" S.A.
Type of promoter and Outcome	Outcome 4, heating plant, private large company
Date of visit	June 6, 2017
Persons interviewed	Tadeusz Kasprzyk (grant manager) Piotr Kowalczyk (technical project manager)
Short project summary	The project was a large investment (over 237 million of PLN with grant rate only 8, 8%) focusing of desulphurisation of one of the biggest heating plants in Poland.
Key results	<p>Applicant: Large private company EDF Poland SA. Status: Project Completed. Final report was approved on June 20th 2017. Final payment received on July 7th 2017 Construction works officially finished in December 2016. Operation started in October 2015.</p> <p>Results: The key result is reduction of the air pollution produced by the heating plant in Krakow. All planned technologies have been installed and tested. The whole FGD unit is now fully operational. The outlet concentration of SO₂ before the construction of FGD unit was more than 1500 mg/Nm³. The new technology guarantees the SO₂ concentration at the outlet from the FGD system is below 200 mg/Nm³ of dry flue gas at 6% O₂ content. Sulphur removal efficiency > 93.6%. The concentrations are measured in real time and the measuring technology is regularly verified by the environmental protection authorities. The real efficiency is higher than expected, the concentration of SO₂ during the site visit was below 20 mg/Nm³ (but the visit took place during the summer season and the plant was operating only at around 20% of its projected capacity). Other significant result if reduction of dust production (efficiency > 90%). In addition, the project created approximately 10 new jobs related to operation of the whole desulphurisation unit.</p>
Strengths & Weaknesses	<p>Strengths: Sufficient personal capacity of the applicant (administrative and technical). Experience of the applicant in terms of grant application and large investment implementation. Financial stability of the large international company.</p> <p>Weaknesses: Higher operation costs, necessity of wastewater treatment.</p>
Recommendations for improvement, should this project continue into future funding mechanism	<p>The project could continue in the future since it is expected that new legislation comes into force introducing more strict limits for SO₂ (requested concentrations 65 – 150 mg/m³) and new limits for heavy metals in air and wastewater.</p> <p>Suggested areas for support in the future (according to project promoter):</p> <ul style="list-style-type: none"> • Improvement of the efficiency of SO₂ removal • Technologies for removal of heavy metals from air and wastewater



Figure 17: General view of the new FGD unit in Krakow including new chimney

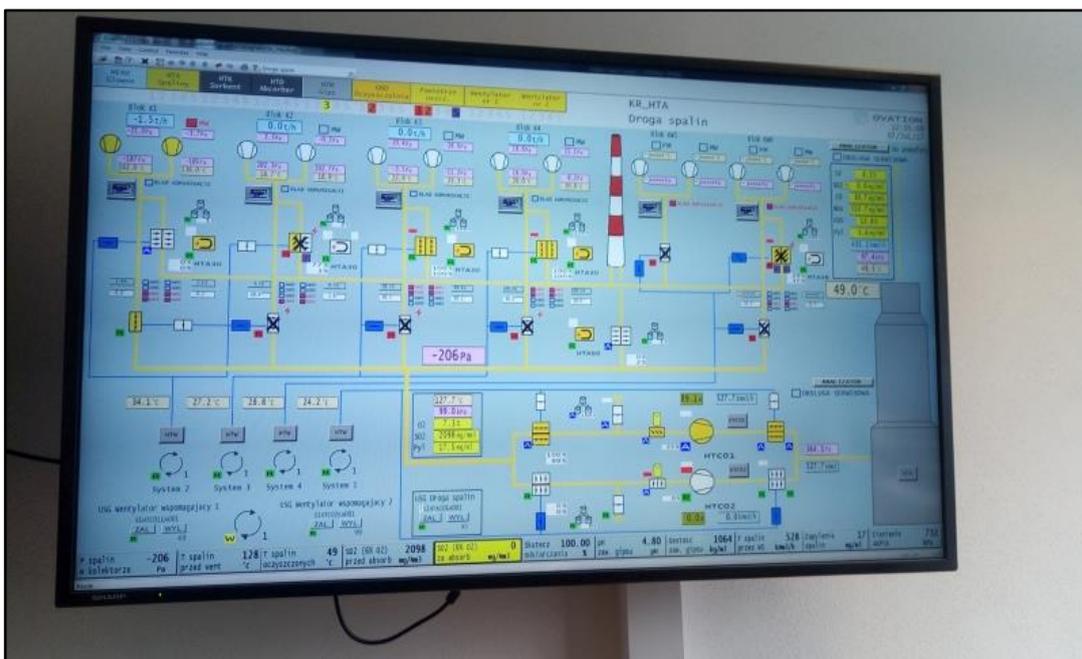


Figure 18: Operation centre of the new FGD unit in the heating plant EDF Krakow

Project number and title	PL0135 - Retrofitting of public buildings and educational institutions in the Korfantów Commune
Type of promoter and Outcome	Outcome 1, public buildings, municipality – public body
Date of visit	June 1 st , 2017
Person interviewed	Gracjan Kurzeja, chief of Department of Investments
Short project summary	<p>The objective of the project was retrofitting of 6 public buildings in Korfantów (2 schools, 2 kindergartens and 2 public administration buildings).</p> <p>The project was initially on the reserve list. When some of the approved projects were withdrawn, the project of Korfantów Commune was moved to the group of approved projects.</p> <p>However, it turned out that the real costs of the project would be significantly higher than the costs included in the grant application. The initial budget was only based on the energy audit and not the real construction budget.</p> <p>It also turned out that some of the buildings are protected as cultural heritage monuments and therefore the renovation is subject to special rules and is likely to last longer and cost more than similar unprotected building.</p> <p>The Commune did not have enough financial resources to cover the real project costs and therefore decided to withdraw the application before signing the contract.</p>
Key results	<p>Applicant: Community Korfantów</p> <p>Status: Withdrawn</p> <p>Results: No results achieved.</p>
Strengths & weaknesses	<p>Strengths:</p> <p>Commitment of the commune to improve the energy efficiency of the public buildings. One of the buildings included in the project was already renovated (financed solely from the municipal budget), three buildings are supposed to be renovated next year (finance by the grant from Structural Funds). The remaining buildings will be renovated as soon as the commune assures necessary financial resources.</p> <p>Weaknesses:</p> <p>Insufficient administrative capacity of the commune caused the withdrawal of the project (the application was elaborated by the external consultants who did not calculate the complete construction budget properly).</p>
Recommendations for improvement, should this project continue into future funding mechanism	<p>The project should certainly continue into future funding mechanism since there are still 2 of the initially planned buildings waiting for renovation.</p> <p>In addition, the project promoter would welcome the grant schemes supporting other types of projects such as:</p> <ul style="list-style-type: none"> • Public lighting (indoor and outdoor) renovation. The public lighting consumes substantial part of energy purchased by the

	<p>commune)</p> <ul style="list-style-type: none"> Improved energy management, “smart cities” technologies
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Project number and title	PL04-0007 - Reconstruction of boiler K1 in order to adapt to the combustion of biomass in Siekierki, Warsaw
Type of promoter and Outcome	Outcome 4, heating company, large enterprise
Date of visit	June 30 th , 2017
Persons interviewed	Jacek Lelen, Krzysztof Przybylski (Project Manager)
Short project summary	The objective of the project was enabling the plant to adapt to the upcoming Industrial Emissions Directive requirements, especially concerning SO _x and NO _x emissions. The project was originally submitted under structural funds, but received too few points. It was then automatically moved to the Norwegian scheme. An existing coal-fired boiler was reconstructed to function as a fluidised-bed biomass-fired unit. Despite delays the project is a technological success.
Key results	<p>Applicant: PGNiG Termika Status: Completed Results: SO_x, NO_x, CO₂ emissions reduced as planned, biomass introduced as an alternative to coal</p>
Strengths & weaknesses	<p>Strengths: Large in-house administrative capacity and staff experienced in operating various funding tools. Highly qualified and experienced CHP plant operators. Developing an alternative to coal as a fuel.</p> <p>Weaknesses: Economic instability due to a very unstable legislative framework concerning renewable energy (green energy support system).</p>
Recommendations for improvement, should this project continue into future funding mechanism	Further funds should be available for limiting emissions of other substances, which will be controlled by the Industrial Emissions Directive. Less emphasis should be put on CO ₂ reduction – more on substances such as mercury, fluoride HCl, etc.



Figure 19: Reconstruction of boiler K1 in order to adapt to the combustion of biomass in Siekierki



Figure 20: Reconstruction of boiler K1 in order to adapt to the combustion of biomass in Siekierki

Annex 3: Summary of the questionnaire survey

The Monitoring Team organized an online questionnaire survey for promoters of projects funded within PL04 programme using Survey Monkey tool. The survey consisted of a set of questions for public bodies and the second version for private bodies (see below). The PO provided valuable help in approaching the respondents by sending an information email including links to the two versions of the questionnaire to all project promoters. The MT then invited all project promoters (mailing list provided by the PO) through the Survey Monkey tool.

The collection of answers was started on June 5 with deadline on June 9. The deadline for respondents was later extended to June 13.

PL04 QUESTIONNAIRE SURVEY QUESTIONS FOR PUBLIC BODIES

1. What are the funding gaps for public bodies seeking to invest in renewable energy and energy efficiency? What types of projects should be supported but there have been no/limited funding opportunities so far?
2. What are the most significant project outcomes others than those covered by the project indicators?
 - improved air quality,
 - reduced emission of other substances than CO₂
 - increased awareness,
 - creation of jobs,
 - lower operational costs
 - direct incomes
 - improved visual appearance of the building
 - reduction of waste production
 - other
3. What are the reasons for the project failing or withdrawn (if relevant)?
4. What are the biggest general barriers to energy projects of the public sector being successfully implemented in Poland?
 - availability of funding (including schemes for pre-financing, state loan guarantees or similar tools),
 - availability and costs of services and supplies needed for implementation,
 - administrative requirements and connected capacity at the public applicants,
 - costs of energy
 - other
5. What are the key success factors of the completed projects?
 - Preparedness of the project from the technical point of view (documentation, permits etc. available at the time of the call launch)
 - Financial strength of the applicant (ability to pre-finance the project or survive cash-flow problems)
 - Availability of staff (technical and administrative)
 - Dedication of the implementation team
 - Political support
 - Public support

- Technical excellence (use of the innovative solutions and best available technologies)
 - Experience of the applicant
 - Selection of the contractor
 - Construction supervision
 - Proper time planning (including sufficient buffers for treatment of unexpected complications)
 - other
6. What would be your recommendations for the next programming period?
7. Any other comments?

PL04 QUESTIONNAIRE SURVEY QUESTIONS FOR PRIVATE BODIES

1. What were the biggest barriers for private sector applicants discouraging them from applying for funding under the PL04 programme?
2. What are the likely funding gaps for private bodies seeking to invest in renewable energy and energy efficiency? What types of projects should be supported but there have been no/limited funding opportunities so far?
3. What are the most significant project outcomes others than those covered by the project indicators? (e.g. increased air quality, increased awareness...)
 - improved air quality,
 - reduced emission of other substances than CO₂
 - increased awareness,
 - creation of jobs,
 - lower operational costs
 - direct incomes
 - improved appearance (of the building)
 - reduction of waste production
 - other
4. What are the key reasons for project failing or withdrawn (if relevant)?
5. How would you compare PL04 programme's attractiveness with other similar funding schemes (e.g. Structural Funds) for private bodies investing in renewable energy and/or energy efficiency?
6. What are the biggest general barriers to energy efficiency projects in the private sector being successfully implemented in Poland?
 - availability of funding (including schemes for pre-financing, state loan guarantees or similar tools),
 - availability and costs of services and supplies needed for implementation,
 - administrative requirements and connected capacity at the public applicants,
 - costs of energy
 - other
7. Is the methodology for calculation of avoided green-house-gas emissions required by the programme appropriate and clear? Please comment:
8. What are the key success factors of the completed projects?

- Preparedness of the project from the technical point of view (documentation, permits etc. available at the time of the call launch)
- Financial strength of the applicant (ability to pre-finance the project or survive cash-flow problems)
- Availability of staff (technical and administrative)
- Dedication of the implementation team
- Political support
- Public support
- Technical excellence (use of the innovative solutions and best available technologies)
- Experience of the applicant
- Selection of the contractor
- Construction supervision
- Proper time planning (including sufficient buffers for treatment of unexpected complications)
- other

9. What would be recommendations for the next programming period?

10. Any other comments?

MAIN FINDINGS OF THE QUESTIONNAIRE SURVEY

There were 72 answers from public bodies representing approximately 70% of total number of promoters and 18 answers from private enterprises or companies providing public services representing approximately 40% of total number of promoters.

Main results of the survey are summarized below:

What are the funding gaps for public applicants?

Public promoters emphasized persisting high absorption capacity for improving energy efficiency of public buildings and lack of support for installations of renewable energy sources (especially photovoltaics). Several promoters stressed out their need for grants rather than loans. Thermo-modernizing of residential buildings including family houses (change of coal-burning stoves) was also expressed as one of funding gaps.

What are the main funding gaps for private bodies?

Private bodies indicated reduction of dust emissions and other gasses than CO₂ as those suffering from insufficient support in Poland. Modernization of coal based installations and large RES installations were also mentioned.

What are the main outcomes of the projects apart from those covered by the project indicators?

Public project promoters identified the following main outcomes: improved visual appearance of the building, improved air quality and reduced emissions of other substances

than CO₂.

For private bodies, the main effects are improved air quality, reduced emissions of other substances than CO₂ and increased awareness on energy efficiency and RES.

What are the main barriers for implementation of energy efficiency and RES projects in Poland?

Both private and public bodies perceive availability of funding and high administrative requirements to be the main barriers.

Is the methodology for calculation of GHG emissions clear and suitable? (only private promoters)

Only for 2 out of 18 private bodies was the methodology not suitable or unclear.

What are the main success factors?

The key success factors for public promoters were dedication of the implementation team, financial strength of the applicant and selection of the contractors.

Private promoters indicated technical preparedness of the project, dedication of the implementation team, financial strength of the applicant and technical supervision as the most important factors.

Political and public support and also technical excellence have the lowest importance for both groups.

Main causes for withdrawals (only private bodies)

There were two answers from private bodies that had withdrawn their projects for the following reasons:

- Short time for organization of tenders and selection of suppliers of services and materials
- Low profitability of RES investments due to variable and unpredictable prices of technologies affecting overall profitability

How do you compare PL04 rules and conditions attractiveness with other programmes? (only private bodies)

Prevailing part of the respondents find PL04 programme rules and conditions similar to other programmes, 4 answers were positive about PL04 and 1 negative. No further details were provided on positive or negative assessments.

Recommendations of private bodies for the next programming period

There were no common points in recommendations of private bodies for the future period except of:

- Increasing maximum grant and grant rate for professional energy sector (especially for coal industry)
- Simplification of application and financial documentation

Other recommendations include more support to heating sector not fulfilling energy efficiency regulations, more flexibility in topics and forms of support for enterprises, timely implementation of the programme and support to small cogeneration, dust extraction and desulphurization measures.

Recommendations of public bodies for future programming period

In general, public bodies would appreciate continuation of the current priorities, i.e. thermo-modernization of public buildings. Main recommendations to the next programme organization and implementation aim at simplification of administrative procedures and mainly financial conditions. The promoters expressed mainly need for higher advance payments and quicker processing of interim reports and related payments. More time for preparation of application is needed according to the opinion of the promoters. Some promoters also recommended improvement of the programme documentation.

In addition to the own survey summarized above, the NFP provided the MT with access to preliminary results of **questionnaire survey of PL04 project promoters implemented by external subcontractor (IDEA company)** within their evaluation of all Polish EEA/NFM programmes. The questionnaire was checked by the MT before designing the own survey in order to avoid similar questions and focus on collecting additional information specific to PL04 programme within the own survey. The IDEA survey was mostly generic aiming at collecting experience of the project promoters with the programme, partnership within the projects, socio-economic impacts of the projects, target groups of the projects, interaction with the PO and overall satisfaction with programme implementation. The IDEA survey received 74 answers from PL04 project promoters. The MT selected 14 relevant questions from total of 38 questions included in the IDEA survey. The results are shortly summarized below:

- Objectives of the project was achieved or rather achieved in all 74 cases.
- Target values of the project indicators were achieved in 72 projects and exceeded in 2 projects.
- Only 15 out of 74 projects reported achievement of additional unexpected effects, usually reduction of emissions other than CO₂.
- 14 respondents reported that socio-economic changes in the areas covered by the support would have taken place if the project had not been implemented.
- All respondents confirmed that the effects of the project would have been visible after the project completion.
- Main target groups affected by the projects were kids, patients and teachers.
- The most common problems during the project implementation were delays in processing payment requests (28), too much workload for project team members (24) and various financial problems (temporary loss of liquidity during the project implementation, unplanned actions to be funded from own resources) (29).
- Only 4 out of 74 respondents reported insufficient support from the PO during the implementation.
- The main socio-economic changes affected by the project implementation were improvement of quality of environment, improvement of quality of life of the inhabitants, improvement of quality of teaching and learning and improved

accessibility to public services.

- No respondent complaint about promotion and information tools used in the programme.
- 8 out of 74 respondents reported low quality (completeness, consistency and usefulness) of documents applied in the programme. The most of the PPs were positive about this aspect.
- 5 out of 74 respondents reported unclear selection procedures. The most of the PPs were positive about this aspect.
- 4 out of 74 respondents reported rather low quality of contacts and relationships with the PO in terms of information flow. The most of the PPs were positive about this aspect.
- 1 out of 74 respondents reported rather low quality of contacts and relationships with the PO in terms of effectiveness of support. The most of the PPs were positive about this aspect.
- Almost half of the respondents (35) had no opinion on organization of the programme into calls and predefined projects, the rest of answers were positive about this aspect.

Annex 4: Summary of the phone interviews

The phone call interviews have been performed during June and July 2017. In total **32 projects promoter representatives have been interviewed**, out of which 3 projects were completed, 19 projects ongoing (some of these already physically completed but waiting for final payments and administrative closure of the project), 6 projects withdrawn and 4 projects rejected. 12 of these projects have been submitted by public authorities, 14 by private enterprises and 6 by private bodies providing public services.

Several respondents requested the questions in written form and replied by e-mail.

PHONE CALL QUESTIONS – COMPLETED OR ONGOING PROJECTS

- 1) What is the actual status of the project?
- 2) What was your motivation for the project application?
- 3) What are the results? What are results other than those covered by main indicators?
- 4) What is the basis for reporting indicators (actually measured or calculated)?
- 5) What were the main problems with the call process?
- 6) What were/are the main difficulties during the project implementation?
- 7) What types of projects should be supported but there have been no/limited funding opportunities so far?
- 8) What can attract/discourage new projects in the future?
- 9) What are the most important factors for successful implementation of the project?
- 10) Any other recommendations or comments?

PHONE CALL QUESTIONS – WITHDRAWN PROJECTS

- 1) What was the reason for withdrawal?
Has the project been implemented after withdrawal?
- 2) What were the main problems with the call process?
- 3) What were/are the main difficulties during the project implementation?
- 4) What types of projects should be supported but there have been no/limited funding opportunities so far?
- 5) What can attract/discourage new projects in the future (especially for private)?
- 6) Any other recommendations or comments for future programme?

PHONE CALL QUESTIONS – REJECTED PROJECTS

- 1) Was the documentation of the call for proposals clear and requirements properly defined?
- 2) What was the reason for project rejection?
- 3) Do you consider the selection process fair and the project rejection justified?

MAIN FINDINGS OF THE PHONE CALLS

The answers provided by the persons interviewed by the phone were very much similar to those provided during the onsite visits and through the online questionnaire. The collected information was used as a background for answering the questions in the Section 3 of this monitoring report. Therefore we will only briefly summarize the main findings:

- All rejected projects accepted the project rejection as fair and justified; the reasons for rejection were incomplete application (missing or wrong annexes) or failing to comply with the eligibility criteria (type of applicant – private company providing public services)
- Reasons for project withdrawal were following:
 - Failing to select the contractor able to complete the construction at the given maximum price (incorrect technical documentation and budget in the preparatory phase)
 - Change of company/municipality investment priorities. Private project promoters usually referred to uncertain economic feasibility due to unstable state support to RES. The reasons of municipalities were related to change of political representation after elections or general reassessment of the investments and available funds.
 - Technical obstacles appearing during the initial stage of implementation (for example the technical documentation did not include all necessary works, the buildings involved were under cultural heritage protection which made the renovation more complicated than expected etc.
 - Combination of the above
- Types of projects recommended for support in the next programming period corresponded to those identified by the questionnaire survey (**thermo-modernization**, RES installations including photovoltaics, energy efficiency management systems). In addition, the need for **renovation of the lighting** (indoor and outdoor) has been mentioned by several public authorities or companies providing public services.

Annex 5: Summary of project reviews

Since various important project documents (e.g. feasibility study or energy audit) exist only in paper form, which was the reason for not transferring them to the MT, the project documentation reviewed included usually just project application form, project implementation plan and final report (if applicable). This only allowed assessment of the planned and achieved activities and results including target and achieved values of indicators of results and impacts. Financial data were also available in the documentation. Project application form and evaluation report were made available for selected rejected projects.

The project documentation was made available for:

- 53 running, completed or withdrawn projects (32 of them included final report)
- 7 rejected projects

This exceeds the originally planned number of reviewed projects (48).

MAIN FINDINGS OF THE REVIEWS

- All the projects completed achieved the planned results (or even exceeded them). However, only some of the projects can already prove achievements of impacts measured usually by avoided emissions CO₂ and other substances, while the most of the projects will report it only after 12 months after launching the operation phase. This relates to industrial projects.
- Completed public projects report achievement of impacts using calculated values from the ecological effectiveness audit, i.e. they are not based on actual measurements as in case of industrial projects.
- The logic of indicators linked with overall objectives, results and impacts is not coherent with standard logical frame approach in case of public projects. In many cases, the indicators of results and impacts are mixed. For example, number of installed solar panels is presented as indicator of impact while corresponding total installed power from RES is included under indicators of results.
- On the other hand, the industrial projects usually follow the logical framework in assigning indicators, but there is little technical information provided about the achieved results. No indicators of overall objectives are given for industrial projects, which makes it inconsistent with public projects.
- Reasons for withdrawals of projects are usually just shortly explained in final reports of withdrawn projects. They include various causes:
 - a. too high price resulting from tendering procedure making it impossible for the promoter to cover the additional project costs (PL0106)
 - b. irregularities occurring during the project implementation (PL0047)
 - c. failure to implement the planned works (PL0050)
 - d. no reasons given (PL0141, PL0031, PL0018)
 - e. financial risk connected with legislative uncertainties (new system of support of RES energy since 2015)(PL0020)
- The reasons for rejection of public projects (all failed in formal check stage) were as follows:
 - a. Wrong calculation of ecological effect (application submitted by Wolbrom

- municipality), the applicant later resigned from the project application
- b. Incomplete application (municipality of Tuczepy)
 - c. The project not eligible – cultural and residential buildings not supported by the programme (Jesuit society in Stara Wies)
 - d. The applicant not eligible in the call (Power plant in Milicz) - Public services as eligibility criterion for private bodies were defined as: public administration, elementary and higher education, health care, social care, science, tourism and sport.
- The reasons for rejection of arbitrary selected private projects were as follows:
 - a. The applicant failed to provide requested justification and additional documents during formal check (Hospital in Slubice)
 - b. The project didn't reach minimum threshold (55 points) during technical evaluation (Health Centre in Myslowice) – both technical evaluators gave exactly the same scores to the project in all evaluation criteria resulting in total of 32 points.
 - c. The project didn't reach the minimum threshold during technical evaluation (Tourist Centre Atol in Olesnica) - both technical evaluators gave exactly the same scores to the project in all evaluation criteria resulting in total of 48 points.