



NATIONAL REPORT BY POLAND – SEPTEMBER 2015

Enhanced Black Carbon and Methane Emissions
Reductions– an Arctic Council Framework for Action

Ministry of Environment Information about current methane and black carbon emission reduction in Poland – insert for Arctic Council rapport

Informacja Ministerstwa Środowiska dotycząca emisji sadzy i metanu – wkład Polski do raportu dla Rady Arktycznej

1. Summary of current black carbon emissions to CLRTAP, where appropriate, and, if available, future projections

Poland fulfills its obligation for preparing *Informative Inventory Report* under UN ECE Convention on Long-range Transboundary Air Pollution (CLRTAP), signed in November 1979 in Geneva. Emission estimates in Poland account for sulphur dioxide, nitrogen oxides, ammonia, carbon monoxide, particulate matter (PM2.5, PM10 and total suspended particulates - TSP), nonmethane volatile organic compounds (NMVOCs), heavy metals (HMs) and persistent organic pollutants (POPs) including dioxins (PCDD/F), HCB, PCB and PAH.

The information on air pollutant emissions mentioned above was included in the *Informative Inventory Report* submitted in March 2015 to the European Union, the European Environment Agency (EEA) and the UN ECE Convention on Long-range Transboundary Air Pollution, which is available on the website:

http://kobize.pl/uploads/materialy/materialy_do_pobrania/krajowa_inwentaryzacja_emisji/IIR%20Poland%202015.pdf.

According to information presented in this *Report*, inventory of black carbon is under preparation.

Poland, as Arctic Council Observer State, will follow Annex B guidance of *Enhanced Black Carbon and Methane Emissions Reductions an Arctic Council Framework for Action* and in 2016 will submit summary of current black carbon, as reported to CLRTAP. Notification on the website containing full emission inventory data will be sent to the Secretariat. Future black carbon emission projections will be reported if available.

Black carbon is emitted directly into the atmosphere in the form of fine particles (PM2.5).

PM2.5 emissions in the years 2012 – 2013 are presented below.

Table 1. *Emissions of PM2.5 in the years 2012 – 2013 [Mg]*

	2012	2013
PM2.5	144 771,3 Mg	144 510,1 Mg

PM2.5 emissions in 2013 decreased by approximately 0.2% relative to 2012.

Table 2. PM2.5 emissions in 2012-2013 according to NFR classification [Gg]

NFR	PM2.5 emissions	
	2012	2013
1A1a Public electricity and heat production	15.10	15.31
1A1b Petroleum refining	0.46	0.27
1A1c Manufacture of solid fuels and other energy industries	0.2	0.27
1A2a Stationary combustion in manufacturing industries and construction: Iron and steel	1.81	2.03
1A2b Stationary Combustion in manufacturing industries: Non-ferrous Metals	0.44	0.51
1A2c Stationary combustion in manufacturing industries and construction: Chemicals	2.44	2.79
1A2d Stationary combustion in manufacturing industries and construction: Pulp, Paper and Print	0.56	0.64
1A2e Stationary combustion in manufacturing industries and construction: Food processing, beverages and tobacco	1.39	1.40
1A2f Stationary combustion in manufacturing industries and construction: Nonmetallic minerals	1.93	1.81
1A3ai(i) International aviation LTO (civil)	0.01	0.01
1A3aii(i) Domestic aviation LTO (civil)	0.00	0.00
1A3bi Road transport: Passenger cars	7.59	7.43
1A3bii Road transport: Light duty vehicles	2.67	2.49
1A3biii Road transport: Heavy duty vehicles and buses	9.22	7.17
1A3biv Road transport: Mopeds & motorcycles	0.00	0.00
1A3bvi Road transport: Automobile tyre and brake wear	1.61	1.60
1A3bvii Road transport: Automobile road abrasion	*NA	NA
1A3c Railways	0.5	0.49
1A3di(ii) International inland waterways	NA	NA
1A3dii National navigation	0.02	0.02
1A3ei Pipeline compressors	0.00	0.02
1A4ai Commercial/institutional: Stationary	5.72	4.95
1A4bi Residential: Stationary	56.49	59.34
1A4ci Agriculture/Forestry/Fishing: Stationary	9.46	9.20
1A4cii Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	8.77	8.52
1A4ciii National fishing	0.42	0.45
1B1a Fugitive emission from solid fuels - coal mining and handling	0.72	0.71
1B1b Fugitive emission from solid fuels - solid fuel transformation	0.89	0.94
2A1 Cement production	1.75	1.63
2A2 Lime production	0.11	0.11
2A3 Glass production	0.63	0.63
2A5a Quarrying and mining of minerals other than coal	0.17	0.17
2A5b Construction and demolition	0.13	0.12
2B6 Titanium dioxide production	NA	NA
2B7 Soda ash production	NA	NA
2B10a Chemical industry: Other	1.40	1.34
2B10b Storage, handling and transport of chem. Products	0.02	0.02
2C1 Iron and steel production	1.83	1.79
2C2 Ferroalloys Production	NA	NA
2C3 Aluminium production	0.02	0.02
2C5 Lead production, including batteries	0.00	0.00
2G Other product use	1.86	1.67
2H1 Pulp and paper industry	0.51	0.53
2L Other production, consumption, storage, transportation or handling of bulk products	0.53	0.51
3B1a Manure management - Dairy cattle	0.02	0.02
3B1b Manure management - Non-dairy cattle	0.03	0.03
3B3 Manure management - Swine	0.07	0.07
3B4e Manure management - Horses	0.00	0.00
3B4gi Manure management - Laying hens	0.04	0.04
3B4gii Manure management - Broilers	0.05	0.06
3B4giv Manure management - Other poultry	0.1	0.07
3F Field burning of agricultural residues	0.2	0.05
5A Biological treatment of waste - Solid waste disposal on land	0.24	0.24
5C1a Municipal waste incineration	0.01	0.01
5C1bi Industrial waste incineration	5.03	5.24
5C2 Open burning of agricultural wastes	1.59	1.75

Figure 1 presents emission trend of PM2.5, PM10 and TSP in the years 1995-2013. The volume of emissions in this period remained stable with small increases in 2005-2007, caused by a higher volume of combusted fuels.

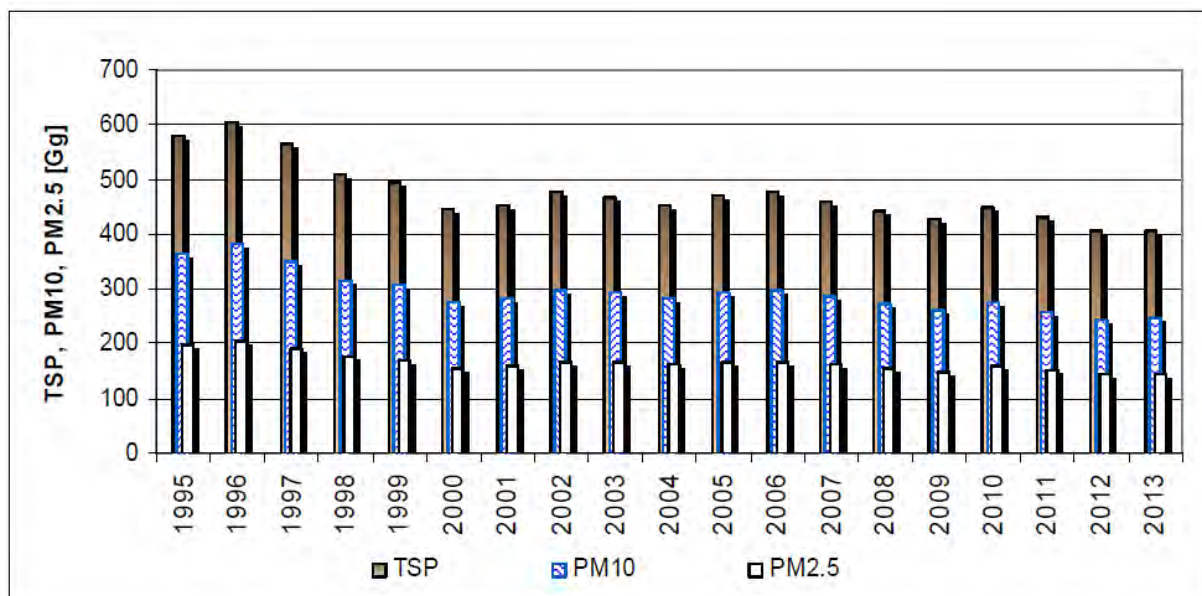


Figure 1. Emissions of particulate matter

2. Summary of current methane emissions to UNFCCC and, if available, future projections

The Polish greenhouse gas inventory is compiled on an annual basis and submitted in the required by deadline of the *United Nations Framework Convention on Climate Change*. The latest *National Inventory Report (NIR)*, submitted in 2014, presents the results of the greenhouse gases (GHGs) inventory in Poland for 2012 as well as for the whole preceding period since 1988. Full version of *Poland's NIR 2014* is available on http://kobize.pl/uploads/materialy/Inwentaryzacje_krajowe/2014/NIR-2014-PL-en-v1.3.pdf. Poland report on the individual review of the annual submission of Poland submitted in 2014 can be found on UNFCCC website:

http://unfccc.int/documentation/documents/advanced_search/items/6911.php?preref=600008424.

The methane emission amounted to 1 953.93 Gg in 2012 i.e. 41.03 million tonnes of CO₂ equivalents. Compared to the base year, the emission in 2012 was lower by 23.5%. The contribution of CH₄ to the national total GHG emission was 10.3% in 2012. Three of main CH₄ emission sources include the following categories: Fugitive Emissions from Fuels, Agriculture and Waste. They contributed 30.2%, 27.8% and 33.6% to the national methane emission in 2012, respectively (fig. 2). The emission from the first mentioned sector was covered by emission from Underground Mines (app. 18.4% of total CH₄ emission) and Oil and Natural Gas system (about 11.6% of total CH₄ emission). The emission from Enteric Fermentation dominated in Agriculture and amounted to app. 21.9% of total methane emission in 2012. Waste disposal sites contributed to 20.9% of the methane emission from total CH₄ emission and Wastewater Handling contributed to 12.9% of total CH₄ emission.

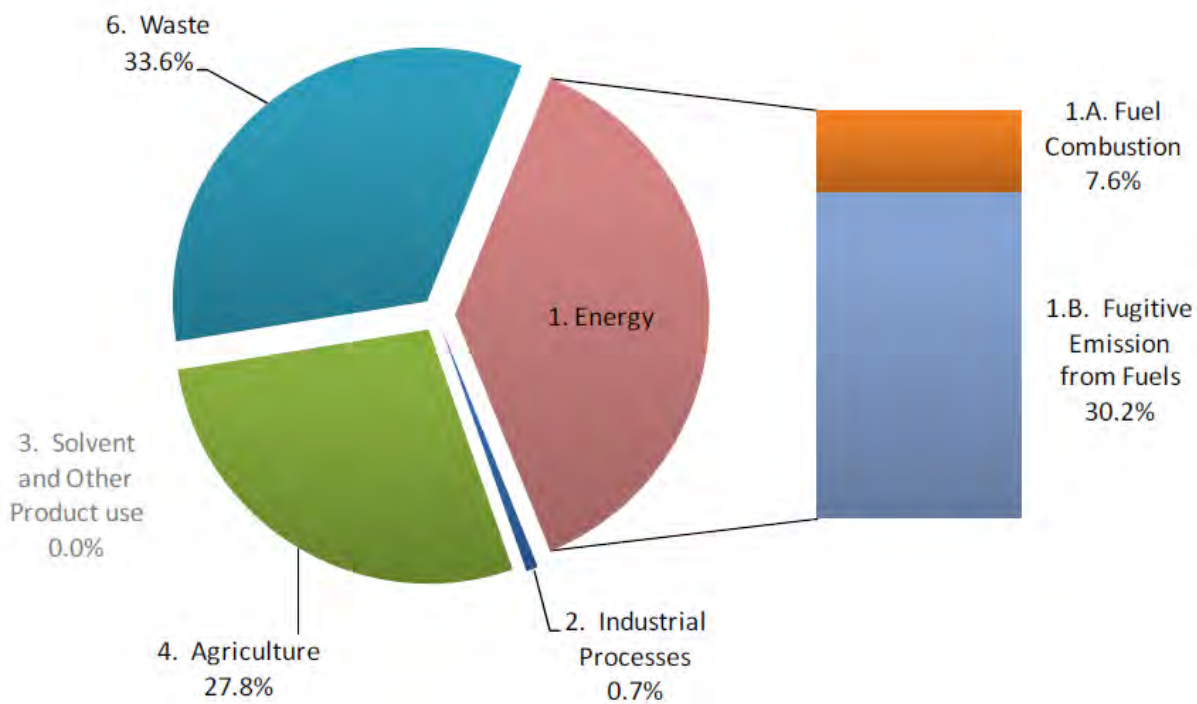


Figure 2. Methane emission in 2012 by sector

Table 3. National emissions of methane for 1988–2012 [Gg CO₂ eq.]

Greenhouse gas	1988*	1990	1995	2008	2009	2010	2011	2012
CH ₄ (without *LULUCF)	55 875.20	49 651.04	45 753.23	41 832.92	40 714.64	41 287.30	40 502.62	41 032.63
CH ₄ (with LULUCF)	58 065.28	51 847.50	47 956.25	44 060.23	42 945.14	43 521.26	42 741.72	43 305.05

*LULUCF -Land use, land use change and forestry

Table 4. Emissions of methane in sectors in 2012 [Gg]

	[Gg]
TOTAL without LULUCF (Land use, land use change and forestry)	1 953.93
TOTAL with LULUCF	2 062.15
1. Energy	734.85
A. Fuel Combustion	149.46
1. Energy Industries	5.07
2. Manufacturing Industries and Construction	4.49
3. Transport	4.89
4. Other Sectors	135.01
5. Other	IE*, NO**
B. Fugitive Emissions from Fuels	585.38
1. Solid Fuels	359.33
2. Oil and Natural Gas	226.06
2. Industrial Processes	14.47
A. Mineral Products	NA***
B. Chemical Industry	13.21
C. Metal Production	1.25
D. Other Production	NE****
G. Other	NO**
3. Solvent and Other Product Use	NE****
4. Agriculture	545.79
A. Enteric Fermentation	427.48
B. Manure Management	117.43
D. Agricultural Soils	NA***
F. Field Burning of Agricultural Residues	0.88
5. Land Use, Land-Use Change and Forestry	108.21
A. Forest Land	1.49
B. Cropland	IE*, NO**
C. Grassland	0.07
D. Wetlands	106.65
E. Settlements	NA***, NO**
F. Other Land	NA***, NO**
6. Waste	658.83
A. Solid Waste Disposal on Land	407.64
B. Wastewater Handling	251.20
C. Waste Incineration	NO**

* IE - included elsewhere

** NO - not occurring

*** NA - not applicable

**** NE – not estimated

3. Summary of National Actions, National Action Plans, or Mitigation Strategies by sectors

- **Poland's Climate Policy - The strategies for greenhouse gas emission reductions in Poland until 2020**

Poland's climate policy - The strategies for greenhouse gas emission reductions in Poland until 2020 was adopted by the Council of Ministers on 4 November 2003. *Poland's climate policy* is an important, integral element of the national environmental policy. In the scope of climate change mitigation, it is one of the examples of the practical implementation of the

principle of sustainable development, given its huge effect on the state of a global equilibrium in the natural environment which is formed in long-term cycles.

The main goal for the energy sector, industry, transport policy, agriculture and forestry in the scope of climate policy is to reduce greenhouse gas emissions, with the additional enhancement of carbon dioxide sinks for forestry.

Measures to reduce greenhouse gas emissions until 2020 by sectors are included in *Poland's climate policy*. Extract information concerning reducing methane emissions is presented below.

Table 5. *Measures to reduce methane emissions according to Poland's climate policy*

Sector	Name of measure	Purpose of introduction
Energy sector	Prevention and reduction of methane emissions from fuel production and distribution	Improvement of energy efficiency
Energy sector	Exemption from excise tax on electricity production from hard coal-bed methane	Emission reductions
Industry	Prevention and reduction of methane emissions from fuel production and distribution processes	Improvement of standards
Agriculture	Dissemination of the Code of Good Agricultural Practice	Promotion of measures to limit pollutant emissions from agricultural production
Waste	Waste reduction at source	Reduction of the quantity and adverse impact of waste at source
Waste	Waste recovery and recycling	Waste recovery and recycling
Waste	Modernization of solid waste landfills	Legal provisions on the landfill and disposal of waste
Waste	Landfill of organic waste	Limitation of the landfill of organic waste at landfills
Waste	Minimization and recycling of waste	Reduction of the quantity and adverse impact of waste
Waste	Monitoring emissions from landfills	Control of CH ₄ and CO ₂ emissions
Waste	Waste sorting before its landfill	Rational waste management
Waste	Enhancement of waste reduction	Reduction of the quantity and adverse impact of waste at source

- **The Sixth National Communication to the Conference of the Parties to the United Nations Framework Convention on Climate Change**

The Sixth National Communication to the Conference of the Parties to the United Nations Framework Convention on Climate Change was prepared in accordance with Decision UNFCCC/CP/1999/7 (Part II). The Communication presents information for the period of 2008 - 2011.

The document contains a summary description of the impact of national measures on greenhouse gas emissions. Extract information concerning reducing methane emissions is presented in the table below.

Table 6. *A summary description of the impact of national measures on methane emissions*

Title of policy/measure	Objective and manner of implementation	GHG	Quantitative assessment of the impact of policies/measures by years [Gg]			
			2010	2015	2020	2025
ENERGY SECTOR						
Support for the use of methane from hard coal mines to produce electricity and heat	Industrial use of methane from methane removal from hard coal mines	CH ₄	265.322 ¹	NA*	NA	NA
Support for the development of energy from renewable sources	Exemption of the sales of electricity from RES from the excise tax and the obligation for energy enterprises to have certificates of origin for electricity from RES	CH ₄ , CO ₂	135.087 ¹	187.048 ¹	163.8461 ¹	169.853 ¹
INDUSTRY						
Implementation of the best available techniques	Prevention and minimisation of emissions	All GHGs	NA	NA	NA	NA
Reductions in methane emissions from fuel production and distribution processes	Introduction of hermetic systems at fuel stations to gain savings in trading in liquid fuels (on average 0.37%)	CH ₄	NA	NA	NA	NA
AGRICULTURE						
The rationalisation of energy management in agriculture, including the production of energy from biomass from waste, liquid manure and solid manure	A package of mechanisms of support for energy supply from RES and improvements in energy efficiency in agricultural production	CO ₂ , CH ₄	16.390	16.390	NA	CH ₄ - by 0.01302
Improvements in animal feeding techniques and feed management	Implementation of breeding programmes and precise animal feeding standards combined with higher productivity and the resulting reduction in the livestock population	CO ₂ , CH ₄	NA	NA	NA	CH ₄ - by 0.100
Improvements in livestock keeping systems, reductions in methane emissions from animal excreta	Research and development to develop new technological systems of buildings and new livestock keeping methods	CH ₄ , N ₂ O, NH ₃	NA	NA	keeping of animals: CH ₄ - by 3.285	storage and disposal of excreta: CH ₄ - by 0.600 keeping of animals: CH ₄ by 3.285
WASTE						
Enhanced recycling of municipal waste	Increasing the recycling of selected fractions of municipal waste. The achievement of the levels of recycling and preparing for the re-use of paper, metals, plastics and glass of at least 50% by weight by the end of 2020	CH ₄ , CO ₂ , N ₂ O	² “avoided” emissions in Gg CO ₂ -eq: 2008: 641.3 2009: 574.1 2010: 663.5 2011: 779.2	³ “avoided” emissions in Gg CO ₂ eq/Mg of waste: 3,000 – 3,500	³ “avoided” emissions in Gg CO ₂ eq/Mg of waste: 4,000 – 4,500	NA
Waste as a source of energy	Energy supply as a result of the application of waste incineration processes and the processing of landfill gas	CH ₄ , CO ₂	⁴ “avoided” emissions in Gg CO ₂ eq: 2008: 159.2 2009: 210.8 2010: 271.0 2011: 373.9	NA	NA	NA
The reduction of the quantity of waste, including biodegradable waste, going to landfills of non-hazardous and inert (municipal) waste	The reduction of the quantity of waste (including biodegradable waste) going to municipal waste landfills	CH ₄ , CO ₂	NA	⁵ reduction by at least 5-10% relative to 2010 (by 383-766 Gg CO ₂ eq)	⁵ reduction by at least 5-10% relative to 2015 (by 345-728 Gg CO ₂ eq)	NA

*NA - Not Available

¹ The effect of the projects supported with the resources of the Voivodeship Funds for Environmental Protection and Water Management

² Calculations based on GUS Yearbooks and the document “Recycling for climate protection. Reducing greenhouse gas emissions – showing responsibility towards future generations” ALBA Group

³ Expert assessment – estimates based on statistical data from GUS on the quantities of the individual fractions of municipal waste collected selectively in a given year (assuming its linear growth); the document “Waste and Climate Change: Global Trends and Strategy Framework”, UNEP 2010

⁴ Calculations based on:

- GUS data on the quantity of heat [GJ] and electricity [MWh] produced in a given year

- assumptions (sources: „Methane Tracking and Mitigation Options - EPA-CMOP”, www.epa.gov; „Optimising anaerobic digestion”, C. Banks, www.forestry.gov.uk)

⁵ Expert assessment – an estimate based on calculations of CO₂ eq. emissions in 2005-2011 from waste landfills. The following information was used: the CO₂ eq. emissions per kg of waste deposited at landfills – 0.39m³ (source: <http://marekpiłowski.com>, accessed on 24 May 2013), CO₂ density – 1.96 kg/m³, GUS data on the quantity of waste deposited at landfills in a given year

• National Programme of Air Protection 2020 (with the prospect up to 2030)

Poland is working on the *National Programme of Air Protection (NPAP)*, which aims at improvement of air quality in Poland (i.a. reduction of emissions PM2.5 and methane). The draft *NPAP* will focus on key actions at national, regional and local level covering strategic, legislative and financial efforts.

The main actions leading to improvement of air quality standards:

- ✓ Emphasizing air quality issues' significance by consolidated actions at the national level and building strategic partnership with key public and private stakeholders dedicated to the air quality improvement.
 - ✓ Establishment of legally binding framework for efficient actions aimed at air quality improvement.
 - ✓ Encouraging society participation in actions aimed at air quality improvement by increasing awareness and creating a dialogue platform with non-governmental organizations in order to boost public involvement.
 - ✓ Development and promotion of technologies enabling air quality improvement.
 - ❖ Increasing the availability of high-efficiency boilers, which pass most stringent emission requirements, while simultaneously replacing and modernizing old, low power facilities/installations, used to generate heating or heating and electricity for non-commercial recipients as well as micro and small companies.
 - ✓ Improvement of emission controlling system of small and medium combustion installations.
 - ✓ Development of financial mechanisms contributing to air quality improvement.
- **”The elimination of low emissions supporting energy efficiency improvements and the development of dispersed renewable energy sources (KAWKA)”**. - **The pilot programme financed by National Fund for Environmental Protection and Water Management**

The programme supports the implementation of the provisions of 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 (CAFE).

Aim of the programme: To reduce the exposure of the population to the impacts of air pollutants in zones with significant exceedances of limit and target values for these pollutants for which air protection programmes have been developed. The aim of the programme will be attained by reducing the emissions of the pollutants, especially particulate matter PM2.5 and PM10, and CO2 emissions.

Implementation period: 2013 – 2018

Programme budget: 800 million PLN

KAWKA – types of projects

- ✓ *the limitation of low emissions related to energy efficiency improvements and the use of high-efficiency cogeneration systems and renewable energy sources*, including:
 - ❖ the closedown of individual boiler-houses, coal-fired furnaces or estate-based boiler-houses
 - ❖ the expansion of a district heating network
 - ❖ the application of high-efficiency boilers (with efficiency of more than 80%), heat pumps and solar collectors

- ❖ thermal modernisation of multi-family buildings as an additional element of the replacement of a source
- ✓ *the reduction of emissions from urban transport sources*, including:
 - ❖ the implementation of traffic management systems
 - ❖ the construction of stations supplying CNG/LNG or electricity to the means of urban public transports (excluding the replacement of vehicles)

- **The priority programme “GAZELA” – low-emission urban transport**

Objective of the programme

Reduction or avoidance of carbon dioxide emission through co-financing projects aiming at reduction of the energy and fuel consumption in urban transport.

Programme budget

The programme's budget for non-repayable forms of co-financing amounts to PLN 80 million - from the resources obtained from sale of assigned amount units (AAUs) or other funds of the National Fund of Environmental Protection and Water Management (hereinafter the National Fund).

2) Payments of funds from commitments undertaken and planned for non-repayable forms of co-financing in the programme amount to PLN 80 million.

Implementation period: 2013-2015

The programme includes the following measures:

1) *Fleet related measures consisting of:*

- a) purchase of new hybride – CNG buses,
- b) training of urban transport vehicles drivers on low-emission fleet operation.

2) *Infrastructure and management related measures including:*

- a) modernisation or construction of a service station for fuelling of hybride – CNG buses,
- b) modernisation or construction of bicycle routes,
- c) modernisation or construction of bus lanes,
- d) modernisation or construction of “Park and Ride” car parks,
- e) implementation of urban transport management systems.

- **Operational Programme Infrastructure and Environment 2014-2020 in Poland**

The *Operational Programme Infrastructure and Environment 2014-2020* envisages a set of concrete measures to support the further shift of Poland towards a more competitive and low-carbon economy that makes efficient use of natural resources, favours low power consumption and advocates a significant reduction of CO₂ emissions. Projects are cofinanced by National Fund for Environmental Protection and Water Management. Important investments in more sustainable transport and energy networks, environmental protection, climate adaptation and mitigation techniques as well as health and culture will nurture a more pro-business environment.

The programme defines a number of ambitious goals to be achieved by the end of the programming period, in particular reduction of greenhouse gas emission by 20.6% compared to 1990 levels.

4. Projects relevant for the Arctic

- **Climate and Clean Air Coalition (CCAC)**

In February 2012, the *Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants (CCAC)* was launched by six governments and the UN Environment Programme (UNEP) as the first global effort to address short-lived climate pollutants (SLCPs).

The Coalition, a voluntary international framework for concrete and substantial action, aims to reduce emissions of methane, black carbon, and many hydrofluorocarbons (HFCs) in order to protect the environment and public health, promote food and energy security and address near-term climate change. Poland is a member of the *CCAC* since March 2013.

The Coalition has approved ten high-impact initiatives to catalyse and scale-up action to reduce SLCPs: seven addressing sectors and three that are cross-cutting.

Sector-based initiatives

1. Accelerating Methane and Black Carbon Reductions from Oil and Natural Gas Production
2. Addressing SLCPs From Agriculture
3. Mitigating SLCPs and Other Pollutants from Brick Production
4. Mitigating SLCPs from Municipal Solid Waste
5. Promoting HFC Alternative Technology and Standards
6. Reducing Black Carbon Emissions from Heavy-Duty Diesel Vehicles and Engines
7. Reducing SLCPs from Household Cooking and Domestic Heating

Cross-cutting initiatives

8. Financing Mitigation of SLCPs
9. Regional Assessments of SLCPs
10. Supporting National Planning for Action on SLCPs Initiative (SNAP)

Further information on the initiatives is available on <http://www.ccacoalition.org/>.

Poland is particularly involved in the initiative regarding Domestic Heating (black carbon reduction) and HFC.