Deliverable C4.1, Vol. 1

The First Climate Action Mirror and Accompanying Reports

English summary

LIFE ClimatePath2050 (LIFE16 GIC/SI/000043)

Projekt LIFE ClimatePath2050 (LIFE16 GIC/SI/000043) je sofinanciran iz sredstev LIFE, finančnega inštrumenta Evropske unije za Okolje in podnebne spremembe na prednostnem področju Podnebno upravljanje in informacije in iz sredstev Ministrstva za okolje in prostor RS, Sklada za podnebne spremembe.
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The First Climate Action Mirror and Accompanying Reports, English summary was prepared within the project LIFE ClimatePath2050 »*Slovenian Path Towards the Mid-Century Climate Target*« (LIFE Podnebna pot 2050, Slovenska podnebna pot do sredine stoletja*, LIFE16 GIC/SI/000043*). The project is carried out by a consortium led by the Jožef Stefan Institute (IJS), with partners: ELEK, Building and Civil Engineering Institute ZRMK (GI ZRMK), Institute for Economic Research (IER), The Agricultural Institute of Slovenia (KIS), PNZ, The Slovenian Forestry Institute (GIS) and external contractors.

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Deliverable C4.1 Vol.1: The First Climate Action Mirror and Accompanying Reports, English summary

Poročilo projekta št. C4.1, volumen 1: Podnebno ogledalo 2018, povzetek v angleškem jeziku

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1 The aim of *The First Climate Action Mirror* preparation

The First Climate Action Mirror report is a document, in which the main findings of the monitoring of the measures for the reduction of greenhouse gas (GHG) emissions implementation for 2017 are presented. In 2019 and 2020 this report will be followed by *The Second* and *The Third Climate Action Mirror* reports, also prepared within the project LIFE ClimatePath2050. The main aim of these reports is to improve the current monitoring reporting system and enhance its use for the implementation of climate actions by:

- ensuring coherent, transparent and high quality information,
- improving access to information to be used in decision-making and thus implementing the continuous improvement cycle (plan-do-check-**act**) for the short-term correction actions and also providing specific guidelines for the mid- and long-term planning tasks,
- reducing the administrative burden by providing information for various reporting purposes,
- streamlining climate-related monitoring and reporting in one system, which is also in line with the planned *Integrated National Energy and Climate Plans* (NECP) to be prepared by the EU member states for the period 2021 to 2030.

2 Preparation process of *The First Climate Action Mirror*

To fulfil the goals of the *Climate Action Mirror* reports, which at the same time include also all the elements needed for the preparation of the annual reports on the implementation of the *Operational Programme for Reducing GHG emissions until 2020* (OP GHG-2020) presented to the Government by the Ministry of the Environment and Spatial Planning, it is essential to enable and encourage the participation of stakeholders, especially the ones from the public sector, in their preparation processes. The process for *The First Climate Action Mirror* consisted of several important parts:

- The process started with the introductory workshop in September 2017. The main aim of the workshop was to present to the public sector stakeholders the main ideas behind the preparation of *The First Climate Action Mirror*.
- While preparing the material for the report also working meetings with representatives from the ministries, responsible for the implementation of the OP GHG-2020, were held.
- In March 2018 the draft version of *The First Climate Action Mirror* was presented and discussed with relevant stakeholders at the workshop.
- While the final version of the *Mirror* was made publicly available at the presentation event on 17.4.2018 (Figure 1), the process itself continued in April and May with 3 workshops

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dedicated to the selected measures in focus, on one hand to discuss a present status and the short term prospects and on the other hand to support also a GHG projections preparation process with the discussion on the GHG mitigation potential and the long term prospective of these measures, and will end with the beginning of the new cycle for the preparation of *The Second Climate Action Mirror* with the workshop in October 2018.

Figure 1: Presentation event of *The First Climate Action Mirror*

3 *The First Climate Action Mirror* structure

The First Climate Action Mirror consists of 8 parts:

- **Part 0: Summary report for decision-makers.** This summary report highlights achieving/achievement of targets in the field of non-ETS GHG emissions and main recommendations for the improvement of measures for GHG emissions reduction from the OP GHG-2020. The report is derived from the *Summary report* and discussed with the main stakeholders (Ministry of the Environment and Spatial Planning, Ministry of Infrastructure, Ministry of Agriculture…).
- **Part 1: Summary report.** This report summarizes the main findings from *The First Climate Action Mirror parts 2 to 6*. It includes an overview of the progress towards targets, current situation of emissions and indicators and recommendations per sector (green growth, buildings, transport, agriculture, other sectors, multisectoral measures) and conclusions for the selected measures in focus (energy poverty, e-mobility and promotion of district heating systems).

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- **Part 2: Indicators for monitoring the implementation of the OP GHG-2020.** The system of the indicators currently consists of 25 indicators – achieving of targets (1), green growth (5), buildings (7), transport (4), agriculture (4), industry (3), waste (1), and 1 indicator for the on-going monitoring, which was developed to help Ministry of the Environment and Spatial Planning in estimating the annual GHG emissions in transport sector on the basis of monthly sold fuel and historic data.
- **Part 3: Catalogue of measures.** The measures are structured by the sector (green growth, buildings, transport, agriculture, other sectors, multisectoral measures). The descriptions include monitoring of the measure's implementation in 2017 and planned implementation in the period 2018-2019 together with recommendations for improvements where needed. The catalogue includes some measures from the *National Energy Efficiency Action Plan (NEEAP)* and *National Renewable Energy Action Plan (NREAP)*, which is in line with the planned combining of plans within the *Integrated National Energy and Climate Plans*, and a separate chapter on financial monitoring of measures. The data for the preparation of the catalogue were collected from publicly available sources, different data bases and directly from those responsible for the implementation of particular measures.
- **Part 4: Selected measures in focus – Energy poverty.** The report summarizes findings from the analysis of measures aimed at reducing energy poverty in households and recommendations for further work. It consists of the estimation of energy poverty in Slovenia and an overview of current instruments for reducing energy poverty, their evaluation from different aspects (relevance, effect, effectiveness, long-term effect, flexibility, predictability) and recommendations for their improvement.
- **Part 5: Selected measures in focus – Electric-mobility.** The report presents the state of e-mobility in Slovenia and the EU, and the proposed measures for further development of this area. The emphasis of the proposed measures is on supporting use of electric vehicles, installation of charging systems and investments in research and development.
- **Part 6: Selected measures in focus – Promotion of district heating systems.** The report includes an overview of district heating in Slovenia, a measure which is particularly important for achieving synergies between climate policy and measures against air pollution. Similar to the measure of energy poverty in part 4, also this report includes an overview of current instruments for promotion of district heating systems, their evaluation from different aspects (relevance, effect, effectiveness, long-term effect, flexibility, predictability) and recommendations for their improvement.
- **Part 7: GHG emissions and EU-ETS sector.** While OP GHG-2020 is oriented only towards the non-ETS sector, *The First Climate Action Mirror* was upgraded also with some information about EU-ETS sector, which contributes 37 % of all Slovene GHG emissions. For this sector 4 indicators were developed and a catalogue of measures for that sector was prepared as well.

The complete *First Climate Action Mirror and Accompanying Reports* in Slovene language are available at https://www.podnebnapot2050.si/rezultati-slovenije/letno-podnebno-ogledalo/.

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4 Main findings of *The First Climate Action Mirror*

4.1 Achievement of goals

Slovenia has set the goal that until 2020 GHG emissions from the non-ETS sector will not rise by more than 4% in comparison to the year 2005. *The First Climate Action Mirror* shows that in 2016 the emissions were 9.9% lower than the target value for that year (Figure 2). Despite the growth of GHG emissions in 2016 for 4.1% is Slovenia still well on track towards its goal for 2020. The first estimates for 2017 show that emissions will probably slightly decreased. However, the situation is not that good in the field of energy efficiency and renewable energy sources (RES). With the continued growth of energy consumption in 2016 reaching the 2020 target for energy efficiency is currently questionable, while achieving of the RES target is even on a critical path. Considering that we are even getting further away from the goal in the last period, in 2016 the share of RES in the use of gross final energy was 21.3%, and the target share for 2020 is 25%.

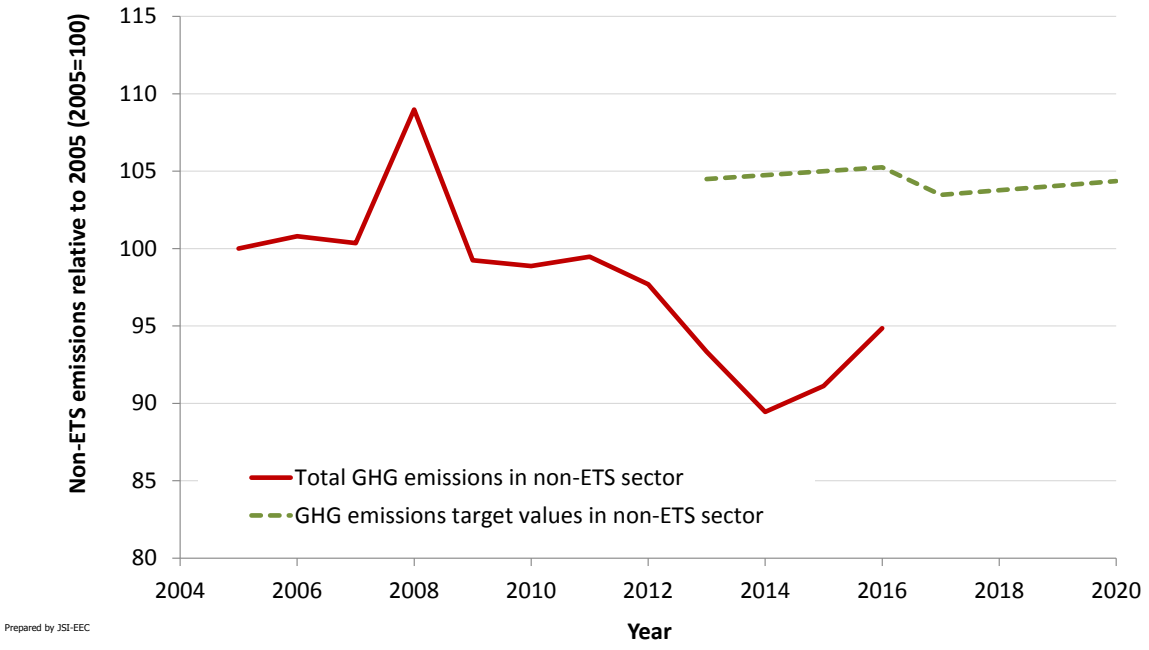

Figure 2: Non-ETS emissions in the period 2005-2016 compared to the target emissions in the period 2013-2020 relative to 2005 emissions (source: JSI-EEC)

The biggest share of the non-ETS emissions, 51%, is coming from the transport (Figure 3), which is the only sector where the emissions are constantly increasing, 28.7% in the period 2005-2016 and 6% in the last year. To achieve the indicative sectoral target in 2020, a reduction of emissions in this sector and their long-term management will have to be ensured.

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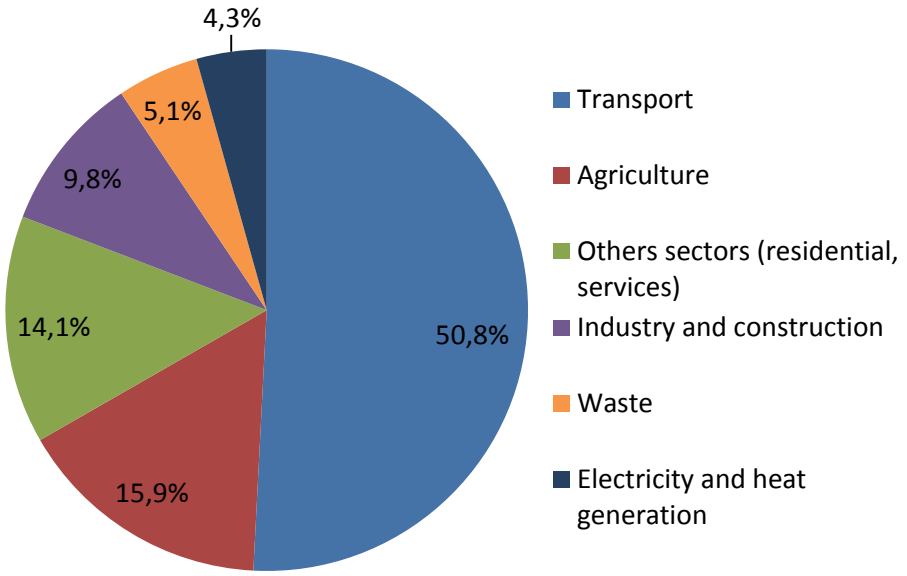

Prepared by JSI-EEC

Figure 3: Structure of non-ETS emissions by sectors in 2016 (source: JSI-EEC)

16% of non-ETS emissions are coming from the agriculture. Despite the fact that emissions in this sector have been growing slowly since 2013 they were in 2016 already under the 2020 target value. Due to a stable trend and slow changes it is expected that the indicative sectoral target will be achieved.

In buildings, which contribute 12% of all non-ETS emissions, the emissions significantly decreased in the period 2005-2014, but in the last two years they are on the rise again. To achieve the target for this sector a reduction of emissions in the period 2017-2020 is needed.

Further reduction of emissions until 2020 will have to be ensured also in industry, which presents 10% of non-ETS emissions. On a good track towards achieving the indicative sectoral target is the electricity and heat generation sector, which contributes only a smaller, 5% share of non-ETS emissions.

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4.2 What do sectoral indicators show?

25 indicators from different sectors – achieving of targets (1), green growth (5), buildings (7), transport (4), agriculture (4), industry (3), waste (1), are used within *The First Climate Action Mirror* to indicate better and weaker points of Slovenian climate actions and also support short-term correction actions and provide specific guidelines for the mid- and long-term planning tasks. The table (Table 2) shows the overview of the indicators and qualitative assessments regarding the achievement of their goals and long-term emission management. The qualitative assessment of the indicator is used to evaluate three levels (green, yellow, red; Table 1) of:

- **Achieving the indicative annual target**. If the annual target has not been achieved, the assessment is given red, otherwise green. Exceptions are examples evaluated yellow, which occur, if deviation of the indicator from the indicative annual target is due to a methodological change in determining the indicator's value or if the deviation from this target, while long-term emission management is evaluated green, is very small.
- **Long-term emission management**. In this assessment, a warning is given that a special attention for the implementation of the OP GHG-2020 until 2020 is needed. The assessment is based on different information: a trend change in recent years, data on poor implementation of measures and identified uncertainties (the recurrence of the worst trend would jeopardize the 2020 target). All these information are given in a separate column.

Table 1: Legend of the indicators' qualitative assessment

☺	**Achievement of the indicative annual target** Long-term emission management. Achieving the 2020 target is expected and the prospects for the years after are good. The following factors are observed: the change of the indicator in the last year (size and direction), the fluctuation of the indicator in the past, it is checked whether the achievement of the target would be jeopardized if the worst year would be repeated more than once, it is estimated whether the implementation of the measures leads towards achieving the target and whether the planned measures are sufficient.
😐	**Non-achievement of the indicative annual target as a result of changes in the methodology, etc.** Long-term emission management. Achieving the 2020 target could be jeopardized. The following factors are observed: the change of the indicator in the last year (size and direction), the fluctuation of the indicator in the past, it is checked whether the achievement of the target would be jeopardized if the worst year would be repeated more than once, it is estimated whether the implementation of the measures leads towards achieving the target and whether the planned measures are sufficient.
☹	**Non-achievement of the indicative annual objective** Long-term emission management. Some signs clearly or a single sign very clearly show that achieving the target in the year 2020 and in the years after could be greatly jeopardized. The following factors are observed: the change of the indicator in the last year (size and direction), the fluctuation of the indicator in the past, it is checked whether the achievement of the target would be jeopardized if the worst year would be repeated more than once, it is estimated whether the implementation of the measures leads towards achieving the target and whether the planned measures are sufficient.

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Table 2: Overview of indicators and targets' achievement and an assessment of the perspective of achieving the 2020 target

No.	Indicator	Unit	Year observed	State	Annual target	2020 target	Indicative annual target achievement	Long-term emission management	Assessment of the long-term emission management - Explanation
General indicators									
1	Annual GHG emissions under Decision 406/2009/EC	kt CO_2 eq	2016	11.187	12.414	12.533	☺		The annual target set is significantly exceeded. Over the past year emissions have increased, which is in the opposite direction from the target. The emissions have increased practically in all sectors, except in the waste sector. If the worst trend from the period 2011-2016 was repeated for two years in a row, then the 2020 target would not be achieved.
1a	Electricity and heat generation	Index (2005=100)	2016	82	102	106	😐		Emissions have increased over the past year. The indicative annual target has been achieved. If the trend from the period 2011-2015 continues, the 2020 target will be achieved. Even if the worst trend from this period is repeated for two consecutive years, the 2020 target will not be compromised.
1b	Industry and construction (with processes and solvent use)	Index (2005=100)	2016	71	62	58	😐		Emissions have remained at the same level as in 2016, which means that the distance from the target is increasing, because until 2020 we expect a reduction. The achievement of the 2020 target is questionable.
1c	Transport	Index (2005=100)	2016	129	129	127	😐		In 2016, emissions increased significantly and the yearly target was not met. The on-going monitoring indicator shows a 3% reduction in transport emissions in 2017. Should the worst-case trend from the period 2011-2016 was repeated for two years in a row, then the 2020 target would be significantly exceeded. The implementation of measures in this sector is very weak.
1d	Other sectors (residential, services)	Index (2005=100)	2016	59	56	47	😐		In the last two years the indicator has deteriorated, the trend is negative and the annual target has not been achieved. Due to the deterioration of the indicators that monitor the implementation of measures in buildings (indicators 2, 3, 5 and 6), achievement of the 2020 target is uncertain.

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No.	Indicator	Unit	Year observed	State	Annual target	2020 target	Indicative annual target achievement	Long-term emission management	Assessment of the long-term emission management - Explanation
1e	Agriculture	Index (2005=100)	2016	100	99	105	☺		Emissions increased in 2016, but the trend is stable and the changes are slow, so we can conclude that emissions in this sector are on the way to achieving the indicative target.
1f	Waste	Index (2005=100)	2016	69	62	56	😐		Emissions have decreased somewhat in the past year, but the annual target has not been achieved. In the future, due to the significantly lower quantity of disposed biodegradable waste from 2016 onwards, emissions will rapidly decline, so that the 2020 target is achievable.
Buildings									
2	Leverage on subsidies for investments in the public sector	EUR/EUR	2016	na	0,45	0,33	😐		The leverage could not be estimated. Estimates for years 2017 and 2018 indicate an approximation to indicative target values.
3	GHG emissions reduction in the public sector	kt CO_2 eq	2016	26	34	64	☹		The indicator remained at the same level as in 2015, and the gap behind the targets was further increased. The short-term projection, based on the available data, shows that the indicator's value will increase again in 2017 and 2018, but it is unlikely that the lag behind the targets will be reduced.
3a	Energy savings in the public sector	GWh	2016	114	160	310	☹		
4	The floor area of buildings renovated in the public sector	1000 m^2	2016	1.262	980	1.795	☺		The indicator remained at the same level as in 2015, but it is still well above the indicative annual target. The indicator follows the target better than the energy savings and the GHG emissions reduction. In order to achieve the necessary emissions reductions, energy renovation will have to be directed towards more comprehensive renovations.
5	CO_2 intensity in the commercial and institutional sectors	t CO_2/mio EUR_{1995}	2016	48	39	32	☹		The indicator has deteriorated for the second consecutive year. As it is changing in the opposite direction from the target, the gap from the target value has increased. The indicator is too rough for a more detailed explanation of yearly changes.

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No.	Indicator	Unit	Year observed	State	Annual target	2020 target	Indicative annual target achievement	Long-term emission management	Assessment of the long-term emission management - Explanation
6	Improvement of energy efficiency in the residential sector – GHG emissions reduction	kt CO_2 eq	2016	120	157	268	☹		The indicator shows an increasing trend, but since it is already lagging behind the targets, the current trend will not be enough to reduce the lag behind the targets. The backlog could be compensated only by increasing the intensity of the measures implementation and by targeting measures, which contribute to a greater GHG emissions reduction.
6a	Improvement of energy efficiency in the residential sector – Energy savings	GWh	2016	901	848	1.401	☹		The indicator is still increasing and the indicative annual target has been achieved, but this could change rapidly with a somewhat slower dynamics of the measures implementation.
7	Specific GHG emissions in the residential sector	kg CO_2 eq/m^2	2016	10	11	9	☺		The indicator improved in 2016 and follows the target, but with the current downward trend, a lag behind the 2020 target is to be expected.
8	Share of RES in energy use for heating and cooling in other sectors (residential, commercial and institutional)	%	2016	56	57	61	☹		The indicator decreased for the first time in the observed period and is lagging behind the targets. Due to the lack of statistics on the use of RES in the service sector, the indicator's value is probably slightly underestimated.
Transport									
9	CO_2 emissions from new passenger cars	gCO_2/km	2016	119	124	101	😐		The indicator follows the goal. The less favourable indicator assessment is influenced by the increase in the difference between the factory data on the energy consumption and emissions and the actual data. This difference will be reduced after the introduction of the new test cycle in 2017.
	and all passenger cars	gCO_2/km	2016	181	168	152	😐		The indicator does not meet the annual targets and the trend is negative. In the period observed the indicator value has improved, but too slowly.
10	Share of renewables in motor fuels	%	2016	1,6	6,5	10,0	☹		The indicator value has deteriorated in the last year and is significantly lagging behind the annual target. The value decreased also a year before.

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No.	Indicator	Unit	Year observed	State	Annual target	2020 target	Indicative annual target achievement	Long-term emission management	Assessment of the long-term emission management - Explanation
11	Passenger-kilometres in the public transport	pkm	2016	1.479	1.800	2.092	☹		While the value of the indicator has a positive trend, the change is too slow, the indicator lags behind the targets.
12	Sustainable freight transport (share of railways in total transport volume)	%	2016	26	24	26	☺		The indicator has improved in the last year. The annual target has been achieved and the indicator currently follows the target. If the worst trend from the period observed is repeated for two consecutive years, the objective will nevertheless be achieved.
Agriculture									
13	Increased efficiency in animal breeding - GHG emissions per kg of milk produced in the country	kg CO_2 eq/kg	2016	0,81	0,81	0,77	😐		The indicator varies greatly also as a result of external circumstances. In the past year, a reduction has been observed and the annual target is almost achieved. However, it is not possible to detect the necessary downward trend for achieving the indicative target value.
14	Rational fertilisation of agricultural plants with nitrogen - Consumption of nitrogen from mineral fertilizers for the fertilization of agricultural plants	kt/year	2016	27	27	28	😐		In the past year, the value of the indicator has deteriorated and lags behind the target value. The average value over the last five years is lower than the 2020 target.
15	Improvement of the efficiency of the nitrogen cycle in agriculture - Gross nitrogen balance surplus	kg N/ha	2016	42	55	53	😐		In the past year, the value of the indicator has improved, but the value varies greatly over the years. The average value over the last five years is lower than the 2020 target.
16	Improvement of the efficiency of the nitrogen cycle in agriculture - Surface of agricultural land included in the measure of ecological farming	1000 ha	2016	42	36	44	☺		The indicator has improved over the last year. The annual target was achieved. Significant improvement was achieved in the observed period.

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No.	Indicator	Unit	Year observed	State	Annual target	2020 target	Indicative annual target achievement	Long-term emission management	Assessment of the long-term emission management - Explanation
Industry									
17	Financial incentives for energy efficiency and renewable energy in non-ETS industry	1000 EUR/year	2016	0	-	-	☹		The indicator deteriorated in 2016, its value reached 0. The target value is not defined. Monitoring of these incentives is not sufficiently systematic.
18	Share of RES in energy use in non-ETS industry	%	2016	19,7	17,9	22,0	☺		The indicator is currently still above the indicative annual target, but it has deteriorated considerably over the last year. With the current downward trend, a lag behind the 2020 target is to be expected.
Industry, process emissions									
19	Emissions of F-gases in stationary equipment	kt CO_2 eq	2016	213	108	92	😐		The indicator has deteriorated in the last year. The indicator lags behind the target, which is also the result of changes in the records of these emissions.
Waste									
20	Quantity of landfilled biodegradable waste	kt	2016	5	56	29	☺		In the last year, the quantity decreased significantly as a result of the upgrading of the infrastructure for mechanical biological treatment of waste before disposal. In 2016 the quantity was significantly lower than the 2020 target.
Green growth									
21	The emission productivity	EUR_{2010}/kt CO_2 eq	2016	2,16	improvement	improvement	😐		The indicator has deteriorated over the last year and is lagging behind the progress in other countries. No target value is specified.
22	Implicit tax rate on energy	EUR/toe	2016	269	236	level comparable with the EU	☺		The target is not specified. The level of the Implicit tax rate is comparable to that of the EU.

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No.	Indicator	Unit	Year observed	State	Annual target	2020 target	Indicative annual target achievement	Long-term emission management	Assessment of the long-term emission management - Explanation
23	Reduction of environment harmful subsidies	EUR million at current prices	2016	124	reduction	significant reduction	☹		The target value is not specified. The goal is to achieve a reduction. In the past year, the indicator has not changed, while it should have improved in the direction of the target.
24	Green jobs	%	2015	24.143	increase	increase	😐		The target value is not specified. The goal is to increase the number of green jobs. In the last years the indicator is changing in the opposite direction of the target.
25	Promotion of the eco-innovation for the transition to a low carbon society	%, EU-28 = 100 %	2016	104	100	100	☺		The indicator fluctuates greatly in comparison to the European average. In the past year, the indicator value has improved. In the observed period, the lag behind the EU average decreased.

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4.3 Overview of measures' financing

In 2016, 24.6 million euros of grants were paid out for the implementation of GHG emissions reduction measures in the public sector, households and transport, 52% down from a year before and 64% less than in 2014 (Figure 4). The main source of funding for incentives was a supplement to energy price for energy efficiency payed by all final energy users (15.6 million euros or 61% of the incentives paid in 2016). The remaining 39% (7.6 million euros) was contributed by the Fund for Climate Change. Unlike previous years, there were no incentives from the European and Infrastructure Funds. The latest incentives from the previous financial perspective (2007-2013) were paid out in 2015, and the first calls for funds within the new financial perspective (2004-2020) were only announced in 2016.

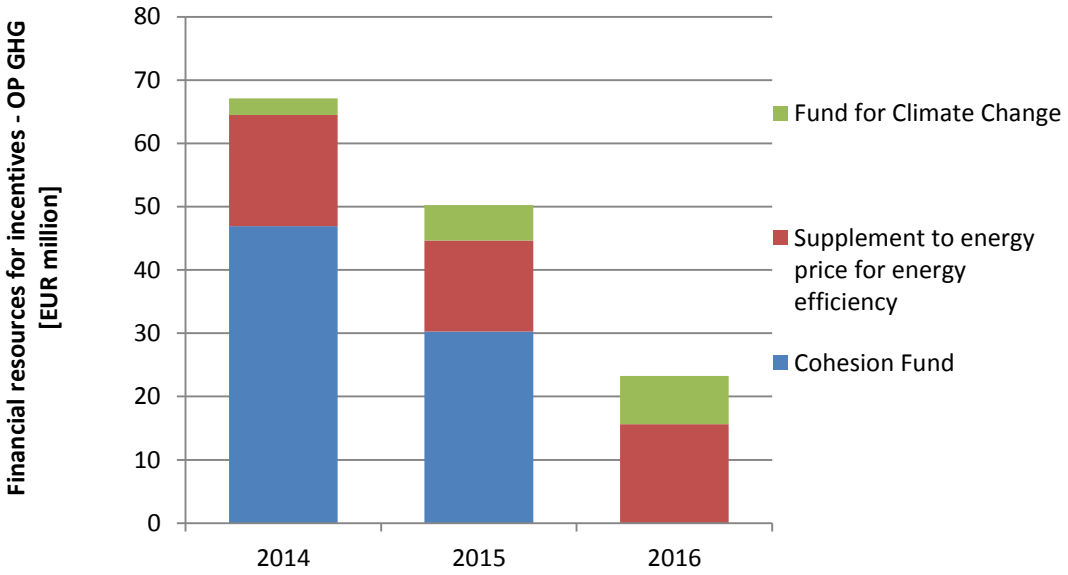

Figure 4: Financial resources for GHG emissions reduction measures in the period 2014-2016 (source: JSI-EEC)

89% of funds were used to support the implementation of measures in buildings, incentives for the transport sector accounted for 11%, while the other sectors in 2016 received no incentives.

Compared to the year 2015, the efficiency of incentives – the ratio between the reduction of GHG emissions achieved and the incentives paid – has somewhat improved. The reason mainly lies in the fact, that in 2016 there were no incentives for the energy renovation of buildings in the public sector from the Cohesion Fund, where in the past the specific costs of incentives were the highest, because the investment was almost entirely subsidized. Also the specific costs of the subsidies for the electric vehicles have slightly decreased. The effects this measure has on GHG emissions reduction are still relatively small – the promotion of this measure is important especially because it supports the penetration of a new technology.

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5 Abbreviations, figures and tables

5.1 List of abbreviations

ETS	EU Emission Trading Scheme
EU	European Union
GHG	greenhouse gas
LIFE	European Union's financial instrument supporting environmental and nature conservation projects throughout the Union
NECP	Integrated National Energy and Climate Plans
NEEAP	National Energy Efficiency Action Plan (Akcijski načrt za energetsko učinkovitost)
non-ETS	installations, emissions or sectors outside the ETS scheme
NREAP	National Renewable Energy Action Plan (Akcijski načrt za obnovljive vire energije)
OP GHG-2020	Operational Programme for Reducing GHG emissions until 2020 (Operativni program ukrepov zmanjšanja emisij toplogrednih plinov do leta 2020)
RES	renewable energy sources

5.2 List of figures

5.3 List of tables

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